

**NATIONAL TREASURY  
PPP MANUAL  
MODULE 4: PPP FEASIBILITY STUDY**

**NATIONAL TREASURY PPP PRACTICE NOTE  
NUMBER 05 OF 2004**

In accordance with section 76(4)(g) of the Public Finance Management Act, 1999 (PFMA), National Treasury may issue instructions to institutions to which the PFMA applies in order to facilitate the application of the PFMA and the regulations promulgated under the PFMA.

This National Treasury PPP Practice Note Number 05 of 2004 'PPP Feasibility Study' applies to departments, constitutional institutions, public entities listed or required to be listed in schedules 3A, 3B, 3C and 3D to the PFMA, and subsidiaries of such public entities.



## Extract from Treasury Regulation 16 to the PFMA

### 16.4 Feasibility study – Treasury Approval: I

16.4.1 To determine whether the proposed PPP is in the best interests of an institution, the accounting officer or the accounting authority of that institution must undertake a feasibility study that –

- (a) explains the strategic and operational benefits of the proposed PPP for the institution in terms of its strategic objectives and government policy;
- (b) describes in specific terms –
  - (i) in the case of a PPP involving the performance of an institutional function, the nature of the institutional function concerned and the extent to which this institutional function, both legally and by nature, may be performed by a private party; and
  - (ii) in the case of a PPP involving the use of state property, a description of the state property concerned, the uses, if any, to which such state property has been subject prior to the registration of the proposed PPP and a description of the types of use that a private party may legally subject such state property to;
- (c) in relation to a PPP pursuant to which an institution will incur any financial commitments, demonstrates the affordability of the PPP for the institution;
- (d) sets out the proposed allocation of financial, technical and operational risks between the institution and the private party;
- (e) demonstrates the anticipated value for money to be achieved by the PPP; and
- (f) explains the capacity of the institution to procure, implement, manage, enforce, monitor and report on the PPP;

16.4.2 An institution may not proceed with the procurement phase of a PPP without prior written approval of the relevant treasury for the feasibility study.

16.4.3 The treasury approval referred to in regulation 16.4.2 shall be regarded as Treasury Approval: I.

16.4.4 If at any time after Treasury Approval: I has been granted in respect of the feasibility study of a PPP, but before the grant of Treasury Approval: III in respect of the PPP agreement recording that PPP, any assumptions in such feasibility study are materially revised, including any assumptions concerning affordability, value for money and substantial technical, operational and financial risk transfer, then the accounting officer or accounting authority of the institution must immediately –

- (a) provide the relevant treasury with details of the intended revision, including a statement regarding the purpose and impact of the intended revision on the affordability, value for money and risk transfer evaluation contained in the feasibility study; and
- (b) ensure that the relevant treasury is provided with a revised feasibility study after which the relevant treasury may grant a revised Treasury Approval: I.



PPP unit

# PPP PROJECT CYCLE

Reflecting Treasury Regulation 16 to the Public Finance Management Act, 1999

PPP Manual reference

PROJECT PREPARATION PERIOD

PROJECT TERM

Phase I

## INCEPTION

- Register project with the relevant treasury
- Appoint project officer
- Appoint transaction advisor

Phase II

## FEASIBILITY STUDY

- Prepare a feasibility study comprising:
- Needs analysis
  - Options analysis
  - Project due diligence
  - Value assessment
  - Economic valuation
  - Procurement plan

Treasury Approval: I

Phase III

## PROCUREMENT

- Design a fair, equitable, transparent, competitive, cost-effective procurement process
- Prepare bid documents, including draft PPP agreement

Treasury Approval: IIA

- Pre-qualify parties
- Issue request for proposals with draft PPP agreement
- Receive bids
- Compare bids with feasibility study and each other
- Select preferred bidder
- Prepare value-for-money report

Treasury Approval: IIB

- Negotiate with preferred bidder
- Finalise PPP agreement management plan

Treasury Approval: III

PPP agreement signed

Phase IV

## DEVELOPMENT

- Measure outputs, monitor and regulate performance,

Phase V

## DELIVERY

- liaise effectively, settle disputes
- Report progress in the Annual Report

Phase VI

## EXIT

- Scrutiny by the Auditor-General

Module 1

Module 2

**MODULE 3**

Module 6

Module 1

Module 2

**MODULE 4**

Module 6

Module 7

Module 8

Module 9

Module 1

Module 2

Module 4

**MODULE 5**

Module 6

Module 7

Module 8

Module 9

Module 1

Module 2

Module 5

**MODULE 6**

Module 7

Module 8

Module 9

## ABOUT THIS MODULE<sup>1</sup>

*Module 4: PPP Feasibility Study* explains in detail how an institution should carry out a feasibility study to decide whether conventional public sector procurement or a PPP is the best choice for the proposed project.

### Requirements for Treasury Approval: I

Working through the feasibility study stages step by step will ensure that institutions provide the relevant treasury with enough information in a systematic format when they submit the feasibility study report for consideration for Treasury Approval: I (TA:I). At the end of each stage is a list of the submission requirements for that stage. These are consolidated into a full list in Stage 7.

#### Take note

Treasury Regulation 16 to the PFMA distinguishes between two basic types of PPP, one involving the 'performance of an institutional function' (delivering a service)<sup>2</sup> and the other involving 'the use of state property by a private party for its own commercial purposes'. In a service delivery project, the institution sets service delivery objectives and pays the private party for the service, usually in the form of a constant unitary payment (for example, for serviced office accommodation); or the users pay (for example, for using a toll road). In PPPs involving the use of state property, an institution's assets – land, equipment or intellectual property – are used to generate revenue for the institution (for example, concessioning conservation land to private eco-tourism operators in return for a share of revenues). There are also hybrid projects, which combine these types.

All PPP projects involve government commitments, in cash or kind, and so a feasibility study is necessary in all cases.

The feasibility study stages and steps presented in this module should be followed substantively for all types of PPP projects, although institutions and their transaction advisors, guided by the relevant treasury's PPP Unit, will need to adapt aspects of the module for projects other than those delivering a service for which a unitary fee is to be paid. *Sectoral Toolkits for PPPs*, based on the methodology presented in this *National Treasury's PPP Manual*, are being developed by National Treasury to guide institutions further.

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1. This module draws on the knowledge gained by National Treasury's PPP Unit across a wide range of projects as well as on international best practice. It borrows from *Partnerships Victoria: Public Sector Comparator Technical Note*, published by the Department of Treasury and Finance, State of Victoria, Melbourne, Australia, in June 2001, and the United Kingdom's Treasury Taskforce guideline document, *How to Construct a Public Sector Comparator*.
  2. Treasury Regulation 16 uses 'for the performance of an institutional function' when it refers to delivering a service. *National Treasury's PPP Manual* uses both terms.



# CONTENTS

<b>INTRODUCTION</b>	<b>1</b>
<b>STAGE 1: THE NEEDS ANALYSIS</b>	<b>3</b>
Part 1: Demonstrate that the project aligns with the institution's strategic objectives	3
Part 2: Identify and analyse the available budget(s)	4
Part 3: Demonstrate the institution's commitment and capacity	4
Part 4: Specify the outputs	6
Part 5: Define the scope of the project	7
<b>STAGE 2: THE SOLUTION OPTIONS ANALYSIS</b>	<b>9</b>
<b>STAGE 3: PROJECT DUE DILIGENCE</b>	<b>14</b>
<b>STAGE 4: VALUE ASSESSMENT</b>	<b>17</b>
Part 1: Construct the base PSC model	19
Part 2: Construct the risk-adjusted PSC model	23
Part 3: Construct the PPP reference model	28
Part 4: Construct the risk-adjusted PPP reference model	32
Part 5: Sensitivity analysis	33
Part 6: Demonstrate affordability	34
Part 7: Initial value-for-money test	35
Part 8: Make the procurement choice	37
Part 9: Verify information and sign off	37
<b>STAGE 5: ECONOMIC VALUATION</b>	<b>40</b>
<b>STAGE 6: PROCUREMENT PLAN</b>	<b>41</b>
<b>STAGE 7: SUBMIT THE FEASIBILITY STUDY REPORT</b>	<b>42</b>
<b>STAGE 8: REVISITING THE FEASIBILITY STUDY</b>	<b>45</b>
<b>ANNEXURES</b>	<b>47</b>
Annexure 1: A PSC model	48
Annexure 2: The significance of the discount rate	55
Annexure 3: How to calculate the value of risk	59
Annexure 4: Standardised PPP Risk Matrix	63



# INTRODUCTION

The feasibility study assesses whether conventional public procurement or a PPP is in the best interests of the institution for the delivery of the service.

## Take note

An institution cannot have definitively chosen a PPP before it has done the feasibility study. A PPP is still just a possible procurement choice and must be explored in detail and compared with the possibility of delivering the service through a conventional public sector procurement.

A feasibility study needs to be authentic and thorough. It is the basis for government's making an important investment decision, not just a bureaucratic requirement. Regardless of the term and scale of a project, there are long-term implications and a great deal at stake when the procurement choice is made.

To comply with the provisions of Treasury Regulation 16 to the PFMA, institutions need approval from the relevant treasury at various points in all four phases of the PPP project cycle. TA:I is for the feasibility study (Phase II of the PPP project cycle). Through the feasibility study, institutions compare the two procurement choices for a particular option.

The feasibility study must demonstrate whether the PPP choice:

- is affordable
- transfers appropriate technical, operational and financial risk to the private party
- gives value for money.

TA:I allows the institution to enter the procurement phase (Phase III of the PPP project cycle).

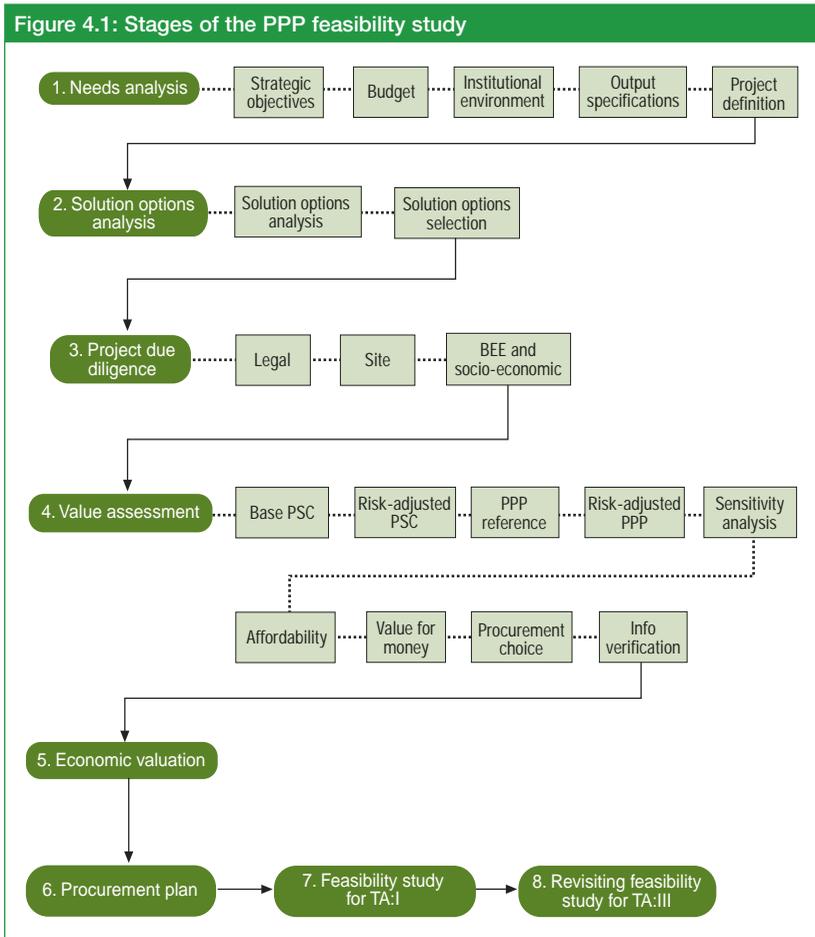
The feasibility study is a critical part of the project preparation period of the PPP project cycle:

- It provides information about costs (explicit and hidden), and gives an indication of whether costs can be met from within institutional budgets without disruptions to other activities.
- It allows for the identification, quantification, mitigation and allocation of risks.
- It prompts institutions to consider how the project will be structured.
- It identifies constraints which may cause the project to be halted.
- It ensures that the project is developed around a proper business plan.

A feasibility study is an evolving, dynamic process. While it is done primarily to decide whether or not to proceed with a PPP, should the PPP procurement choice be made, it is also used throughout the procurement phase: for continuous risk tracking; to determine value for money at Treasury Approval: IIB (TA:IIB) and Treasury Approval: III (TA:III); and to check affordability at TA:III.

Figure 4.1 shows the stages of the PPP feasibility study. The text that follows explains in detail the steps and deliverables for each stage. Working through the eight stages – following the steps closely and providing the deliverables – will

ensure that the institution provides the relevant treasury with all the information it requires to assess the proposed project for TA:I, and will avoid delays caused by incorrect or missing information.



## STAGE 1: THE NEEDS ANALYSIS

The needs analysis gives definition to the proposed project, preparing the way for the solution options analysis in Stage 2, which explores the range of possible solutions to meeting the identified needs.

The needs analysis will have been considered during the inception phase.<sup>3</sup> During this feasibility study phase it will be thoroughly interrogated.

### The needs analysis

- Part 1: Demonstrate that the project aligns with the institution's strategic objectives
- Part 2: Identify and analyse the available budget(s)
- Part 3: Demonstrate the institution's commitment and capacity
- Part 4: Specify the outputs
- Part 5: Define the scope of the project

### Part 1: Demonstrate that the project aligns with the institution's strategic objectives

To be in an institution's best interests, a project needs to align with the institution's policy and priorities.

**Step 1: Summarise** the institution's mission and vision statements, its strategic objectives, and the government policy that determines what the institution's deliverables are.

**Step 2: Describe** the functions that the institution performs in the public interest or on behalf of the public service.

**Step 3: Discuss** the following aspects of the project:

- How does the project contribute to the implementation of government and institutional policy?
- Does the institution have the ability and the capacity to provide the services?
- What is the relative size of the project, in terms of its anticipated budget or capital expenditure?
- What are the potential cost savings for the institution?
- What is the capacity of the private sector to provide the services?
- How complex is the project?
- What does the public require in relation to the services?

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3. See *Module 3: PPP Inception: Stage 1: Part 1*.

- Given the proposed duration of the project, will it address the broad needs of the institution over time?
- Will the proposed project meet the institution's needs in the time required?

## **Part 2: Identify and analyse the available budget(s)**

This analysis must include:

- A discussion of any assumptions about future budgetary commitments required from government: How much will be required over what period of time, escalating in line with the CPIX?
- A discussion of any consolidation of budgets, namely, drawing funds from various budgets into a consolidated budget which will be ring-fenced for this project. These budgets may be internal to the institution but may also involve identification of budgets in other institutions, for example, the Department of Public Works.
- A list of the line items currently in the institution's budget for costs which may no longer be incurred as a result of the proposed project. For example: If a government department is housed in different buildings, there may be costs associated with delivering mail between buildings. If the proposed project is to house the department in one building, the department would no longer incur these costs, which then represent potential savings.

As affordability is a cornerstone of the feasibility study phase, the budget for the project will be revisited at various stages in the feasibility study, including Stage 2: Step 2 and Stage 4: Part 2: Step 9; and closely in Stage 4: Part 6.

Refer to the relevant treasury's directives on budget preparation in terms of the PFMA.

## **Part 3: Demonstrate the institution's commitment and capacity**

**It needs to be clear that the institution can manage, process, evaluate, negotiate and implement the project.**

### **Step 1: Provide information on the institution's project officer and project team, and the transaction advisor**

#### **1. The project officer and project team**

- the names of the institution's project team members
- their roles in the project
- their relevant skills
- brief CVs
- the budget available for project management

## **2. The transaction advisor**

- the names of the members of the transaction advisor
- their roles in the project
- their relevant skills
- brief CVs
- the budget available for transaction advice

## **3. An assessment of**

- lines of decision-making within the institution, particularly between project officer, senior management and the accounting officer/authority
- any areas where a lack of capacity exists, in the project team or in the transaction advisor
- a plan on how the lack of capacity will be addressed throughout the project process
- the plans for skills transfer from the transaction advisor to the project team at various stages of the project
- how staff turnover will be managed

## **Step 2: Provide information on key stakeholders**

### **1. Possible key stakeholders include:**

- those within the institution
- other government departments
- other spheres of government
- organised labour
- third parties
- the public.

### **2. Describe the nature of each relationship and the project's impact on each stakeholder**

In particular, identify impacts on the funding, resources or processes of the key stakeholders. This is important for establishing where the service will begin and end. For example: In a serviced accommodation project, the State Information Technology Agency (SITA) would be a key stakeholder and this would help to define where the IT services would begin and end.

### **3. Include a consultation plan**

The plan should detail how and when consultation will take place during the project preparation period of the project cycle, and how the views and contributions of key stakeholders will be incorporated into the project. Also include the results of any consultation the institution has already undertaken, and any required concurrence obtained from government stakeholders, such as permission from South African Heritage Resources Agency (SAHRA) to demolish a building.

### Step 3: Consult with the relevant treasury

Consult with the relevant treasury about the project, especially about budgetary and affordability issues.

For national departments and public entities this will entail discussions with the Public Finance division of National Treasury and with the institutions' own accounting officers and chief financial officers.

For provincial departments and public entities, there must be consultation with the Intergovernmental Relations division of National Treasury and the provincial treasury. A signed letter from the provincial treasury stating that the project is affordable must accompany the submission of the feasibility study report for TA:I.

## Part 4: Specify the outputs

**Once the institution's objectives and budget have been identified, and its commitment and capacity demonstrated, the outputs of the proposed project need to be specified.**

### Input vs output: Conventional procurement vs PPP procurement

**Conventional procurement specifies the input. The institution defines what it requires in order for it to deliver a particular service.**

With conventional procurement, the institution prepares detailed specifications that describe the infrastructure required to deliver a service. The required infrastructure is then put out to tender. Once the contract is awarded, the institution closely supervises the construction of the infrastructure to ensure compliance with the tender specifications. Thus the institution is responsible for the design and planning of the project, all statutory requirements (such as environmental and heritage approvals and town planning regulations), and any costs that may arise due to unforeseen circumstances or elements that were omitted from the tender. The contractor is only responsible for what is covered by the tender specifications, or anything which could reasonably have been foreseen. Specifying inputs excludes the possibility for alternative solutions which bidders could come up with, and may inhibit innovation. Risk allocation will be affected as the specified input may prevent appropriate risk transfer.

**PPP procurement specifies the output. The institution defines the service that it needs to deliver.**

The key element of a PPP project is the definition of an institutional function through specifying the output(s). The institution leaves the design of the infrastructure required to deliver the service up to the private party which will be selected through a bidding process. For policy or strategic reasons, the service requirements may not be left entirely to the discretion of the private party, and in these circumstances the institution may specify some inputs. PPP projects should, however, be driven substantially by output specifications, which allow for optimal risk transfer to the private party and thereby ensure greater value for money for the institution.

**Defining the service through specifying the outputs requires the institution to apply its mind to what needs to be achieved, as opposed to how it will be achieved.**

The concept of output specifications entails a change in how the institution views delivering its services. Instead of procuring infrastructure, the institution should be thinking of procuring the service with specified outputs. For example, the outputs for delivering a prison service would include required standards of accommodation for inmates, security, rehabilitation, catering, cleaning, health care, maintenance, and so on. Conventional procurement would specify the design and materials required for a prison building.

### **Step 1: Describe the service that the institution needs to deliver**

### **Step 2: Specify the outputs required to deliver that service**

### **Step 3: Specify the minimum standards for the outputs**

This will ensure that the service delivered by the project meets the institution's expectations.

### **Step 4: Assess whether the output specifications can meet the institution's ongoing service needs**

It may be necessary to specify to what extent the project must provide a flexible solution that can be expanded or enhanced over time.

### **Step 5: Specify key indicators that will measure performance**

This will allow for more accurate costing of the output specifications.

### **Step 6: Identify service interface expectations**

This concerns the interface between the project and the institution's other services.

### **Step 7: List the BEE and socio-economic targets that the institution wishes to achieve in the project, using the PPP BEE balanced scorecard<sup>4</sup> as reference.**

## **Part 5: Define the scope of the project**

In light of the institution's needs and strategic objectives, and the output specifications for delivering the required service, give a brief definition of the proposed scope of the project. This should be a concise outline of the institution's requirements, which will allow for the selection of reasonable service delivery options.

Briefly set out:

- a summary of how the project objectives will address the institution's strategic objectives, as determined in Part 1
- a summary of the output specifications, as determined in Part 4
- a list of significant government assets which will be used for the project (such as land and equipment)
- a brief indication of the type of PPP project that may be appropriate, and its envisaged payment mechanism, for example, a service delivery project in which a unitary fee will be paid. This will be further investigated at Stage 4: Part 3 of the feasibility study, and set out in detail in the bidding documents during the procurement phase<sup>5</sup> of the PPP project cycle.

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4. See *Module 2: Code of Good Practice for BEE in PPPs: Part IV*.

5. See *Module 5: PPP Procurement*.



## Requirements for the feasibility study report: The needs analysis

- Institution's strategic objectives
- Budget
- Institutional analysis
- Output specifications
- Scope of the project

## STAGE 2: THE SOLUTION OPTIONS ANALYSIS

### **Choosing the best way of responding to a service need: The solution first, then the procurement choice**

The solution options analysis sets out the range of possible technical, legal and financial options for delivering the required service to the output specifications, allowing the institution to weigh up the options and make a choice.

For example, if an institution needs to provide additional accommodation services for its staff, the solution options might be:

- to rent space in another suitable building
- to refurbish the existing building
- to construct a new building.

**For the rental option**, the institution will rent space, move its staff, and continue operating. The institution would not need treasury approval as this is not a PPP, and would thus not need to do a PPP feasibility study.<sup>6</sup>

**For the refurbishment option**, the institution could decide to refurbish the building itself and provide its own ancillary services either internally or through separate contracts (cleaning, security, IT, furniture, etc.). Alternatively, it could enter into a PPP where a private party would refurbish the building and provide all the ancillary services and receive a fixed fee for doing so. Thus the solution option can either be procured through conventional public sector procurement (the institution refurbishes the building itself and provides its own ancillary services) or through a PPP (a private party refurbishes the building and provides the ancillary services).

The same two procurement choices would be possible for **the option to construct a new building**.

If the institution decides that its preferred solution option is to refurbish its existing building and provide the ancillary services, the value assessment stage (Stage 4) of the feasibility study will explore the two procurement options: the institution doing the refurbishment and providing ancillary services itself and a private party doing it on behalf of the institution. The choice of whether or not to procure the solution option as a PPP can only be made after this stage.

#### **Take note**

In the solution options analysis stage, institutions will still not be in a position to make the decision about whether or not a PPP is the best way to procure the preferred solution option. In the solution options analysis, the institution identifies and evaluates the various potential options for meeting the institution's need to deliver a service. It then recommends one of the options, and gives an indication of whether it might be suitable for a PPP. After the project due diligence (Stage 3), comes the detailed work in the value assessment (Stage 4) required to make the decision about whether to pursue a PPP.

**A PPP is not a solution option. A PPP may be a procurement choice for a preferred solution option.**

6. Good business practice dictates that any investment or procurement decisions should be backed up by a thorough feasibility study.

## The solution options analysis

Step 1: List all the solution options the institution has considered

Step 2: Evaluate each solution option

Step 3: Choose the best solution option

### **Step 1: List all the solution options the institution has considered**

The list must cover the range of the most viable solution options for providing the specified outputs of the required service.

### **Step 2: Evaluate each solution option**

The purpose of the evaluation is to:

- identify the advantages and disadvantages of each solution option
- examine the risks and benefits for, and potential impacts on, government of each option
- identify which of the solution options may be procured as a PPP.

#### **1. Brief description**

Briefly describe each solution option, including an outline of the alignment between each option and the institution's strategic plan, the service it needs to deliver, and the output specifications.

#### **2. Financial impacts**

Provide a preliminary view and discussion on the financial impacts of each option. For example, show the estimated initial capital expenditure, and the likely capital and operational costs over the full project cycle. (This preliminary analysis of financial impacts will provide a basis for the detailed work to come in Stage 4.)

#### **3. Funding and affordability**

How is each option to be funded? Which options are affordable? Where a government contribution is anticipated, this must be agreed to by the relevant treasury or there may be delays later. Such funding must come from an existing budget line, as there are strict limitations on institutions' borrowing capacity. Indicate how a PPP procurement of an option is likely to be financed (for example, project finance or corporate finance). The payment mechanisms (conventional budgetary, unitary payment, user pays, revenue-generating, hybrid) that may be possible for each option must also be briefly discussed.

#### **4. Risk**

Present a preliminary discussion about the risks to government in relation to each option. (Risk is tackled in detail in Stage 4: Part 2.) The discussion should specifically identify the risks that may be passed efficiently to a private party.

#### **5. BEE and other socio-economic aspects**

Provide a preliminary view on the impact of each option on the BEE targets set out

in the outputs specifications, and other socio-economic targets on which the institution may wish to deliver in the project. (BEE is tackled in detail in Stage 4: Part 3.)

## **6. Service delivery arrangements**

Discuss the service delivery arrangements for each option, and analyse the implications of each option for optimal interface between services. For example, if the institution is assessing its options for accommodation services, how would each solution option deal with the integration of IT and communications services?

## **7. Transitional management issues**

Discuss the issues that may arise in the handover from existing management arrangements in each solution option. For example, each solution option for staff accommodation will have implications for how an institution's security, IT, delivery and despatch systems are managed in the transition from the existing to the new.

## **8. Technical analysis**

A comprehensive technical analysis must be presented for each solution option, including a supply chain/interface analysis. Include an assessment of the proposed technology and its appropriateness for each solution option.

## **9. Site issues**

If a solution option involves a physical site, issues around the procurement of land must be identified at this stage, such as: land use rights, zoning rights, geo-technical, environmental issues, relevant national or provincial heritage legislation, and alignment with municipal Integrated Development Plans. (These issues will be dealt with in detail in Stage 3, but must be identified for each solution option now.) The likelihood of being able to resolve all site issues during the course of the feasibility study phase of the PPP project cycle is a key factor in deciding on a preferred solution option if a PPP procurement is possible. The preference is for all site issues to be resolved during the feasibility study, before TA:I is granted.

## **10. Legislation and regulations**

Does a particular option comply with the relevant legislation and regulations? Analyse, firstly, procurement legislation and regulations, and, secondly, sector-specific legislation and regulations, which may impact on the project, to establish a compliance list against which each option can be measured. Certain solution options may not legally be performed by a private party. If, for example, the South African Revenue Service (SARS) wants to revamp its custom office systems, can a private party legally perform a state function such as scanning imported goods on behalf of SARS? There may be legislation stipulating that only an employee of SARS or the South African Police Service (SAPS) may do so, which may limit SARS' solution options and procurement choices.

In Stage 3 the legal issues for the chosen option will be dealt with comprehensively. At this stage, what is required is a brief, high-level analysis.

### **11. Human resources**

- Establish the numbers and cost of existing institutional staff that will be affected in each solution option, do a skills and experience audit, and establish the key human resources issues for the project.
- Design and implement a suitable communication strategy for the institution to keep staff informed of the project investigations, as required by labour law.
- Assess the following for each option, where relevant:
  - relevant legislation and case law
  - organised labour agreements
  - the cost of transferring staff, if applicable
  - an actuarial study of accrued benefits that may be transferred, and timing thereof
  - an initial view on the potential willingness of both staff and private parties to implement transfers.

### **12. Market capability and appetite**

Assess each solution option using the following considerations:

- Is there the capability within the private sector to deliver the required services?
- Will the service delivery be sufficiently reliable?
- Is it possible that such delivery would provide value for money?
- What are the BEE enterprises in the sectors and are BEE charters being implemented?
- Are there local suppliers for this service?
- What market competition is there for this type of project?
- Do the output specifications restrict which suppliers can be used?

It may be appropriate to use a form of market testing, possibly an Expression of Interest.<sup>7</sup>

### **13. Qualitative factors**

There will be a number of qualitative benefits associated with a particular option, which may not be quantifiable and may not be considered as offsetting costs. While financial considerations are likely to drive the affordability test in Stage 4 of the feasibility study, it is important that these qualitative factors be identified early. For example: Cabinet has agreed that all departmental head offices must be located in the inner city. So, although there might be a suitable building or site outside of the inner city, which may be cheaper or more appropriate for other reasons, Cabinet's decision will affect the choice of solution option.

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<sup>7</sup>. See *Module 5: PPP Procurement*.

#### **14. Early considerations of suitability for a PPP**

Not all solution options are ideal PPPs. During this solution options analysis stage, it is useful to consider the various options' potential to deliver value for money as a PPP.

- **Scale**

The net present cost of the probable cash flows should be large enough to allow both the public and the private parties to achieve value-for-money outputs given the likely levels of transaction advisor and other costs.

- **Outputs specification**

It must be possible to specify outputs in clear and measurable terms, around which a payment mechanism can be structured.

- **Opportunities for risk transfer**

The allocation of risk to a private party is a primary driver of value for money in a PPP. Where opportunities for allocating risk to the private party are limited, the potential for a PPP to deliver value for money compared with a conventional procurement choice is reduced.

- **Market capability and appetite**

The project must be commercially viable, and there must be a level of market interest in it.

#### **Step 3: Choose the best solution option**

Each solution option has now been evaluated, including an initial assessment of its potential as a PPP. A matrix approach can be used to weigh up the evaluation of each option against another to assist in the choice of the best one. (Use the list of evaluation items in Step 2.) In this last step of the solution options analysis stage, recommend which option(s) should be pursued to the next stage.

If the preferred solution option looks likely to be able to be procured through a PPP, it will be fully tested in Stage 4 of the feasibility study, and the preferred option may change after this test. If, after Stage 4, the preferred solution option is not demonstrably affordable, it may be necessary to revisit the solution options analysis. If the preferred solution option cannot be procured through a PPP, the institution should discuss its subsequent feasibility study method with the relevant treasury.

It is preferable that only one solution option is chosen, and no more than three. If more than one option is recommended for which PPPs may be possible, each must be separately assessed in Stage 4.



#### **Requirements for the feasibility study report: The solution options analysis**

- Options considered
- Evaluation of each solution option
- Identification of which solution option(s) may be procured as a PPP
- Recommendation of a preferred solution option

## STAGE 3: PROJECT DUE DILIGENCE

The due diligence stage is an extension of the solution options analysis stage and aims to uncover any issues in the preferred solution option that may significantly impact on the proposed project.

### Project due diligence

Step 1: Legal issues

Step 2: Site enablement issues

Step 3: BEE and other socio-economic issues

### Step 1: Legal issues

**Experience shows that legal issues not resolved during the feasibility study phase of the PPP project cycle create significant delays at the negotiations stage of the procurement phase, and in some cases have been significant impediments to concluding a PPP agreement.**

Although a preliminary legal analysis of each solution option was done in the options analysis stage, a comprehensive legal due diligence of the preferred option(s) must now be done to ensure that all foreseeable legal requirements are met for the development of the project. Although it may be costly to undertake a comprehensive legal due diligence of all aspects of the project in this early phase, it is ultimately worthwhile. Early legal certainty directly affects project costing in Stage 4 (thus assisting in making the procurement choice), reduces PPP bidding costs for all parties, and avoids using costly time on these issues in the negotiations stage.

Common legal issues that arise centre on use rights and regulatory matters. However, the institution's legal advisors should conduct a thorough due diligence on all the legal issues which have a bearing on the project.

### Use rights of the institution

Obtain legal opinion about the extent to which the institutional function or use of state property can legally be performed by a private party in a possible PPP.

#### Take note

PPPs may not be used to limit an institution's responsibilities for performing its institutional functions. Even though in a PPP the institution contracts a complete or partial institutional function to the private party, the institution remains accountable for the efficient delivery of this service.

## **Regulatory matters**

It can generally be assumed that the institution performs its mandated functions within the regulations. Regulatory due diligence is only required for the PPP procurement choice. However, if the project being explored is a greenfields project and the institution has never done this kind of project before, then a regulatory due diligence will be necessary for both conventional procurement and a PPP.

Investigate any regulatory matters that may impact on the private party's ability to deliver as expected. These may include:

- tax legislation
- labour legislation
- environmental and heritage legislation
- foreign exchange legislation
- legislation governing the use of certain financial instruments
- competition legislation
- sector regulations such as airport licensing, health standards, building codes, etc.

## **Step 2: Site enablement issues**

Where a physical site is involved, indicate whether the institution intends to specify a preferred site, nominate a definite site, or leave the question of location open to bidders.

If the institution nominates a particular site, it will need to identify, compile and verify all related approvals. The purpose is to uncover any problems that may impact on the project's affordability and value for money, or cause regulatory delays at implementation.

Establish the following:

- land ownership
- land availability and any title deed endorsements
- are there any land claims?
- are there any lease interests in the land?

Appoint experts to undertake surveys of:

- environmental matters
- geo-technical matters
- heritage matters
- zoning rights and town planning requirements
- municipal Integrated Development Plans.

## **Step 3: BEE and other socio-economic issues**

Identify sectoral BEE conditions (for example, the extent to which BEE charters have been developed and implemented), black enterprise strength in the sector, and any factors that may constrain the achievement of the project's intended BEE outputs. Also identify socio-economic factors in the project location that will need to be directly addressed in the project design.



## Requirements for the feasibility study report: Project due diligence

- Legal aspects
  - Use rights
  - Regulatory matters
- Site enablement
- BEE and other socio-economic issues

## STAGE 4: VALUE ASSESSMENT

This is the pivotal stage of the feasibility study. It enables the institution to determine whether a PPP is the best procurement choice for the project. The three tests prescribed by Treasury Regulation 16 to the PFMA are:

- Is it affordable?
- Does it appropriately transfer risk from the institution to the private party?
- Does it provide value for money?

### Comparable models

To determine which procurement choice is best for a project, a comparative assessment has to be made between delivering the same service (to the identical output specifications) as a conventional public sector procurement or as a PPP. A risk-adjusted public sector comparator (PSC) model and PPP reference model must therefore be constructed for the chosen solution option. These provide costings of each procurement option in the form of a discounted cash-flow model adjusted for risk.

A **PSC model** is a costing of a project with specified outputs with the public sector as the supplier. Costs are based on recent, actual costs of a similar project, or best estimates.

A **PPP reference model** is a costing, from first principles, of a project with the identical specified outputs but with the private sector as supplier.

Comparing the two models enables an institution to assess whether service delivery by the government or by a private party yields the best value for the institution. The three criteria are affordability, risk transfer and value for money.

### Risk

Risk is inherent in every project. Conventional public sector procurement has tended not to take risk into account adequately, often resulting in unbudgeted cost overruns. In a PPP, the risks inherent in the project are managed and costed differently by the private party. The treatment of risk in the project is a key aspect of the value assessment.

### Affordability and value for money

**Affordability** is whether the cost of the project over the whole project term can be accommodated in the institution's budget, given its existing commitments.

**Value for money** means that the provision of an institutional function by a private party results in a net benefit to the institution, defined in terms of cost, price, quality, quantity, or risk transfer, or a combination of these.

**Value for money is a necessary condition for PPP procurement, but not a sufficient one. Affordability is the driving constraint in PPP projects.**

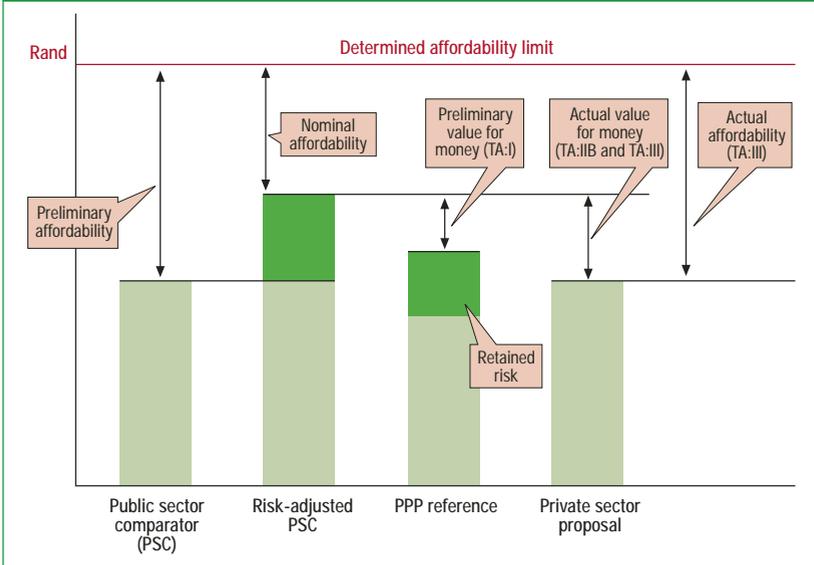
### Demonstrating affordability

As a preliminary analysis of affordability, the risk-adjusted PSC model is compared with the institution's budget. Then the risk-adjusted PPP reference model is compared with the institution's budget. If the project is not affordable, the institution may modify the output specifications or may have to abandon the project.

### The value-for-money test

The value-for-money test is only conducted as part of TA:II when actual private bids are submitted. But an initial indication of whether conventional public sector procurement or a PPP will provide value for money is a requirement for TA:I. The risk-adjusted PSC model provides the benchmark for value for money when compared with the PPP reference model in this feasibility study phase, and when compared with the private bids in the procurement phase.

Figure 4.2: Affordability and value for money<sup>8</sup>



### Take note

A proposed PPP project may provide value for money, but be unaffordable if the specifications are too high. Value for money is a necessary condition for PPP procurement, but not a sufficient one. If a project is unaffordable it undermines the institution's ability to deliver other services and it should not be pursued. Affordability is the driving constraint in all PPP projects.

### Value assessment

- Part 1: Construct the base PSC model
- Part 2: Construct the risk-adjusted PSC model
- Part 3: Construct the PPP reference model
- Part 4: Construct the risk-adjusted PPP reference model
- Part 5: Sensitivity analysis
- Part 6: Demonstrate affordability
- Part 7: Initial value-for-money test
- Part 8: Make the procurement choice
- Part 9: Verify information and sign off

8. This figure does not demonstrate the 'time value of money', which must be calculated in the financial models and shown as net present value (NPV), using appropriate discount rates.

## Part 1: Construct the base PSC model

### What is the base PSC model?

The base PSC model represents the full costs to the institution of delivering the required service according to the specified outputs via the preferred solution option using conventional public sector procurement.

The base PSC costing includes all capital and operating costs associated with the project.

The risk-adjusted PSC model includes a costing for all the risks associated with the project.

The public sector does not usually cost these risks, but it is necessary to get this understanding of the full costs to government of the proposed project.

#### Key characteristics of the PSC model

- expressed as the net present value (NPV) of a projected cash flow based on the appropriate discount rate for the public sector
- based on the costs for the most recent, similar, public sector project, or a best estimate
- costs expressed as nominal costs
- depreciation not included, as it is a cash-flow model

#### The central functions of the PSC model

- promotes full cost pricing at an early stage
- is a key management tool during the procurement process, assisting the institution to stay focused on the output specifications, costs and risk allocation
- is a reliable way of demonstrating the project's affordability
- provides an initial indication of value for money
- is a consistent benchmark and evaluation tool
- encourages bidding competition by creating confidence in the financial robustness and integrity of the feasibility process
- is sufficiently robust that the service could be procured conventionally if, at any stage, the PPP fails to show value for money

### Construct the base PSC model

Step 1: Provide a technical definition of the project

Step 2: Calculate direct costs

Step 3: Calculate indirect costs

Step 4: Calculate any revenue

Step 5: Explain all assumptions used in the construction of the model

Step 6: Construct the base PSC model and describe its results

‘Annexure 1: A PSC model’ provides a complete example of the process outlined step by step in Stage 4: parts 1 and 2. Readers may find it useful to work through the steps with reference to the example.

### **Step 1: Provide a technical definition of the project**

What norms and standards will be applied in the project? What maintenance cycles are expected? Describe these carefully, bearing in mind that the same principles must apply in the PPP reference model to come, in order to allow for a comprehensive comparison.

### **Step 2: Calculate direct costs**

Direct costs are those that can be allocated to a particular service. These costs must be based on the most recent public sector project to deliver similar infrastructure or services (including any foreseeable efficiencies, for example, regular life-cycle maintenance), or a best estimate where there is no recent comparable public sector project. If there are no comparable projects in South Africa, draw on the experience of projects in similar environments in other countries.

#### **1. Capital costs**

Direct capital costs are specifically associated with the delivery of new services, and may include, for example, the costs of constructing a new facility or acquiring a new asset. The PSC model should account for direct capital costs in the year in which they occur, including, but not limited to, the costs of design, land and development, raw materials, construction, and plant and equipment (including IT infrastructure). Direct capital costs should also account for the project's labour, management and training costs, including financial, legal, procurement, technical and project management services. Only the costs associated with developing and implementing the project should be included in the PSC model. It is also important to include the costs of replacing assets over time.

#### **2. Maintenance costs**

Direct maintenance costs will include the costs over the full project cycle of maintaining the assets in the condition required to deliver the specified outputs, and may include the costs of raw materials, tools and equipment, and labour associated with maintenance. The level of maintenance assumed must be consistent with the capital costs, the operating cost forecasts and the residual value treatment of any assets.

#### **3. Operating costs**

Direct operating costs are associated with the daily functioning of the service and will include full costs of staff (including wages and salaries, employee benefits, accruing pension liabilities, contributions to insurance, training and development, annual leave, travel and any expected redundancy costs), raw materials and consumables, direct management and insurance.

#### **4. BEE costs**

Direct BEE costs are the costs of achieving the project's identified BEE objectives. The Preferential Procurement Policy Framework Act, 2000 (PPPFA) provides for a ceiling on the price premium to be paid for BEE in the supply of goods and services

contracted through conventional procurement. Calculate the costs of preferential procurement on the supply of goods and services as stipulated by the PPPFA 90:10 formula. Use the specific BEE targets set for the project in Stage 1: Part 4.

### **Step 3: Identify indirect costs**

The project's indirect costs are a portion of the institution's overhead costs, and will include the costs of: senior management's time and effort, personnel, accounting, billing, legal services, rent, communications and other institutional resources used by the project. The portion can be determined by using an appropriate method of allocation, including but not limited to:

- number of project employees to total institutional employees for personnel costs
- project costs to total institutional costs for accounting costs
- number of project customers to total institutional customers for billing costs.

### **Step 4: Identify any revenue**

The total cost of delivering the service should be offset by any revenues that may be collected.

Project revenue may be generated where:

- users pay for the service or a part thereof
- the use of the institution's assets generates revenue
- service capacity exists above the institution's requirement
- the institution allows third parties to use the service.

Any revenue collected must reflect the institution's ability to invoice and collect revenue. (This should have been identified during Stage 2.)

Forecasting potential revenues can be difficult, especially where there is little or no historical information. In revenue-generating or user-pays projects, this element will be a significant component of both the PSC and PPP reference models, and the institution's specialist advisors should consider market testing.

### **Step 5: Explain assumptions**

Explain in detail all assumptions the model makes about the inflation rate, the discount rate, depreciation, treatment of assets, available budget(s), and the government's Medium-Term Expenditure Framework (MTEF).

### **Inflation**

The model should be developed using nominal values. In other words, all costs should be expressed with the effects of expected future inflation included. This also allows for easy comparison with the institution's budget, which is expressed using nominal values. Inflation projections should be made with reference to the inflation targets set by the Reserve Bank. The MTEF budget cycle which government uses is adjusted annually by CPIX.

## **The discount rate**

(See 'Annexure 2: The significance of the discount rate'.)

For practical purposes, the discount rate is assumed to be the same as the risk-adjusted cost of capital to government. The government bond yield has been used by some institutions as the discount rate for a particular project over a comparable period. The argument in favour of using the government bond yield is that it reflects the actual cost to government of raising funds at any given time. This ignores a number of factors that are difficult to quantify, including: various risk margins relating to increased government borrowing; various tax implications of diverting funds from private to public consumption; and government's time preference of spending.

National Treasury does not prescribe a discount rate. The institution, with advice from its transaction advisor, should choose a nominal government bond yield rate over a similar term to the length of the project term as the risk free discount rate for the project. National Treasury may be called upon to help with deciding which bond rate is applicable for a particular type of project.

National Treasury does not advocate reflecting projects risks as a premium in the discount rate. Risks are valued as cash-flow items. (See 'Annexure 3: How to calculate the value of risk'.)

Although National Treasury's preference is for the reflection of risk as a cash-flow numerator, there are certain projects where there are risks inherent in the project over and above the risks quantified in the cash flow for the project. This may warrant using a discount rate that is the government bond yield and an additional risk premium above the bond yield rate as a representation of additional risk in the project. It is important to note that the necessity of applying a risk premium to the risk free discount rate should be done on a project-by-project basis and only in cases where it is not possible to accurately reflect the effect of all risks in the cash flow of the project.<sup>9</sup>

The discount rate chosen for the project must then be applied consistently in all the feasibility study models.

As National Treasury prefers that the PSC and the PPP reference models are in nominal terms, the discount rate must also be in nominal terms and there is thus no need to adjust for inflation.

## **Depreciation**

Since the PSC model is calculated on cash flow, not on accrual, non-cash items such as depreciation should not be included.

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9. The UK has used an average margin of 1.5 per cent above its bond yield in determining the discount rate of capital.

## Step 6: Construct the base PSC model and describe its results

The base PSC model must be presented as a discounted cash-flow model.

The complexity of the model will depend on the complexity of the project. Simple output specifications can be analysed using a simple cash-flow statement. For projects that entail capital investment and/or generate revenues, the PSC model will need to include a cash-flow timing profile.

Provide a brief narrative explanation of the construction of the model and its key results.

Show the net present cost of the base PSC model.

## Part 2: Construct the risk-adjusted PSC model

**The risk-adjusted PSC model is the base PSC model plus a costing for all the risks associated with undertaking the project. Government does not usually cost these risks, but it is necessary to do so in order to understand what the full cost to government will be if it undertakes the project.**

### Risk and public sector procurement

In conventional public sector procurement, risk is the potential for additional costs above the base PSC model. Historically, conventional public sector procurement has tended not to take risk into account adequately. Budgets for major procurement projects have been prone to optimism bias – a tendency to budget for the best possible (often lowest cost) outcome rather than the most likely. This has led to frequent cost overruns. Optimism bias has also meant that inaccurate prices have been used to assess options. Using biased price information early in the budget process can result in real economic costs resulting from an inefficient allocation of resources.

Much of the public sector does not use commercial insurers, nor does it self-insure (through a captive insurance company). Commercial insurance would not provide value for money for government, because the size and range of its business is so large that it does not need to spread its risk, and the value of claims is unlikely to exceed its premium payments. However, government still bears the costs arising from uninsured risks and there are many examples of projects where the public sector has been poor at managing insurable (but uninsured) risk.

### Construct the risk-adjusted PSC model

- Step 1: Identify the risks
- Step 2: Identify the impacts of each risk
- Step 3: Estimate the likelihood of the risks occurring
- Step 4: Estimate the cost of each risk
- Step 5: Identify strategies for mitigating the risks
- Step 6: Allocate risk
- Step 7: Construct the risk matrix
- Step 8: Construct the risk-adjusted PSC model
- Step 9: Preliminary analysis to test affordability

‘Annexure 3: How to calculate the value of risk’ provides an example of the process outlined step by step below. Readers may find it useful to work through the steps with reference to the example.

## **Step 1: Identify the risks**

### **Two workshops**

The identification of risks is best done in a workshop setting with the institution, its transaction advisor and the relevant treasury’s PPP Unit’s project advisor. The focus of the first workshop should be purely on identifying the risks. A separate workshop should be held to assess and quantify their impact. This is recommended because clearly identifying risks and sub-risks can be clouded by discussions about their potential financial impact. Separate workshops will also allow the advisors to prepare adequately for assessing and quantifying the financial impact of the identified risks.

### **Who should attend the risk workshops?**

- the project officer and project management team
- any other institutional officials who will be responsible for managing the project during the construction/development stages of the project and for contract management thereafter
- all members of the transaction advisor, including the financial, legal and insurance advisors, and sector specialist advisors on, for example, design, engineering, facilities management, IT
- project advisors from the relevant treasury’s PPP Unit and project officers from other institutions who can share relevant experiences

### **How to identify the risks**

Explore each risk category in detail during the workshops, and produce a detailed, project-specific list. (See ‘Annexure 4: Standardised PPP Risk Matrix’ for the range of categories of risk typically found in PPP projects.) This list will be developed into a risk matrix for the project in Step 7. It is important to identify and evaluate all material risks. Even if a risk is unquantifiable, it should be included in the list. Do not forget to include any sub-risks that may be associated with achieving the BEE targets set for the project.

#### **Take note**

When identifying risks by referring to an established list, there is the possibility that in the list generated for the project, a risk not listed may have been left out by mistake (as opposed to simply not being a risk for this specific project). At the end of the risk identification workshop, go through the various stages of the project and consider various scenarios of what might actually happen. Many of the risks that reveal themselves may already have been identified via the risk matrix, but some new risks may come up. Also be vigilant for duplicated risks.

It may be difficult to compile a comprehensive and accurate list of all the types of risks. The following can be helpful sources of information:

- similar projects (information can be gathered from the original bid documents, risk matrices, audits and project evaluation reports) both in South Africa and internationally
- specialist advisors with particular expertise in particular sectors or disciplines.

### **Step 2: Identify the impacts of each risk**

The impacts of a risk may be influenced by:

- **Effect:** If a risk occurs, its effect on the project may result, for example, in an increase in costs, a reduction in revenues, or in a delay, which in turn may also have cost implications. The severity of the effect of the risk also plays a role in the financial impact.
- **Timing:** Different risks may affect the project at different times in the life of the project. For example, construction risk will generally affect the project in the early stages. The effect of inflation must also be borne in mind.
- **Type:** Some risks are difficult to quantify accurately.
- **Severity of the consequence.**

It is essential to specify all the direct impacts for each category of risk. For example, construction risk is a broad risk category, but there could be four direct impacts, or sub-risks:

- cost of raw material is higher than assumed in the PSC model
- cost of labour is higher than assumed in the PSC model
- delay in construction results in increased construction costs
- delay in construction results in increased costs as an interim solution needs to be found while construction is not complete.

Each impact is thus a sub-risk, with its own cost and timing implications.

### **Step 3: Estimate the likelihood of the risks occurring**

Estimating probabilities is not an exact science, and assumptions have to be made. Ensure that assumptions are reasonable and fully documented, as they may be open to being challenged in the procurement process or be subject to an audit. There are some risks whose probability is low, but the risk cannot be dismissed as negligible because the impact will be high (for example, the collapse of a bridge). In this case a small change in the assumed probability can have a major effect on the expected value of the risks. If there is doubt about making meaningful estimates of probability, it is best practice to itemise the risk using a subjective estimate of probability rather than to ignore it. Institutions should also be prepared to revisit initial estimates, if they learn something new that affects the initial estimate. Together with estimating the probability of a risk occurring, it is also necessary to estimate whether the probability is likely to change over the term of the project.

**A subjective estimation of probability** is based on past experience or current best practice, and supported by reliable information, if available. Simply, realistically estimate how likely final costs are to be above or below the amount in the base PSC

model. If reliable information is not available, institutions and transaction advisors will have to make assumptions about the logical, commonsense likelihood of a risk occurring. It is essential that all assumptions be fully documented.

However, if the probability of a risk occurring is high or the potential impact is significant, and there is sufficient reliable information, an advanced technique should be used as it can provide more conclusive results.

**Statistical risk measures** are more advanced and have the advantage of being based on robust economic principles. The disadvantage is that they can be more complicated to calculate and interpret, and require a large amount of reliable information. Comprehensive statistical risk analysis often requires special software and the assistance of an experienced risk analyst. Multivariable analysis techniques, like Monte Carlo simulation, have been successfully used in the valuation of risks for road projects. This type of analysis requires estimating a range of possible risks together with their probabilities of occurring, and the maximum and minimum project costs for the different scenarios. It is particularly useful for considering the impact of a number of risks together. A key disadvantage of multivariable analysis is that it shifts the focus away from the analysis of individual risks, and for risks to be meaningfully put to use in the PSC model, the potential impact of each individual risk needs to be understood.

Whatever risk assessment techniques are used, the risks and their bearing on the project must be well understood by the institution. The method used should be agreed between the institution and its transaction advisor.

#### **Step 4: Estimate the cost of each risk**

##### **Risk as a cash-flow item**

National Treasury advocates costing risk as a separate cash-flow item, and not adjusting the discount rate to indicate the level of risk in a project. The cash-flow method promotes a focus on the costs of each risk and enables an understanding of how risk can be transferred and what its financial effects are. In addition to this, valuing each risk as a separate cash-flow item accounts for the time implication of that risk (some risks may only have an impact at the beginning of a project, and the impact of other risks may diminish or escalate over the life of the project).

- Estimate the cost of each sub-risk individually by multiplying the cost and the likelihood.
- Assess the timing of each sub-risk.
- Cost the sub-risk for each period of the project term.
- Construct a nominal cash flow for each risk to arrive at its net present value.

### **Step 5: Identify strategies for mitigating the risks**

A risk can be mitigated either by changing the circumstance under which the risk can occur or by providing insurance for it. Indicate what the risk mitigation strategy for dealing with each particular risk will be, and the attendant cost of such mitigation.

### **Step 6: Allocate risk**

Once risks have been identified and costed, analyse which risks should be carried by the private party, which the institution should retain, and which will be shared, if this project were to be procured through a PPP. For the risk-adjusted PSC model, all risks will usually be carried by the institution, as would be the case with conventional procurement. It is, however, necessary to do a preliminary risk allocation at this stage, as it will assist the institution in separating out the risks which will be allocated to the private party and which risks will be kept by the institution. This will be reflected in the PPP reference model.

A risk should be carried by the party best able to manage that risk. The principle for allocating risk should be value for money. Where retaining a risk presents value for money for the institution, it should be retained.

### **Step 7: Construct the risk matrix**

**A comprehensive risk matrix is a fundamental component of PPP procurement as it is used to identify and track risk allocation throughout the drafting of the PPP agreement, the bidding process, PPP agreement negotiation and financial closure.**

The risk matrix consolidates all identified project risks, their impacts, and their associated costs. Include all risks (retained by the institution and transferred to the private party) in the calculation of the PSC. List those which are to be retained or transferred as these will need to be costed for the PPP reference model and will also be used and elaborated on during the procurement phase.

### **Step 8: Construct the risk-adjusted PSC model**

Once costs have been established for all identified risks, the base PSC must be risk-adjusted. This is done using the following simple formula:

$$\text{Risk-adjusted PSC} = \text{Base PSC} + \text{Risk}$$

Users of the Manual should closely follow the example in 'Annexure 1: A PSC model' of adjusting the base PSC for risk. The example is limited to one risk category – construction risk – but illustrates the steps for determining a value for risk.

### **Step 9: Preliminary analysis to test affordability**

As a preliminary assessment of the project's affordability, compare the risk-adjusted PSC model with the institution's budget for the project as estimated during the solution options analysis (Stage 2). (The budget will be examined in

detail in Stage 4: Part 6.) If the project looks unaffordable by a wide margin in the PSC model, it may be necessary to revisit the options analysis.

## Part 3: Construct the PPP reference model

**The PPP reference model is a hypothetical private party bid to deliver the specified outputs.**

The PPP reference model is the costing of the output specifications from a private party's perspective. Comparing the risk-adjusted PSC model with the risk-adjusted PPP reference model enables the institution to assess whether service delivery by government or by a private party yields the best value for money for the institution.

The PPP reference model must be developed using the identical output specifications as those used in the PSC model, but technically and financially it is very different. As the institution will not know what a private party will charge for the outputs specifications, costs will have to be estimated. The transaction advisor must have the necessary expertise, market knowledge and experience to construct a market-related PPP reference model.

### Construct the PPP reference model

Step 1: Confirm the type of PPP

Step 2: Describe the proposed PPP project structure and sources of funding

Step 3: Develop the core components of the payment mechanism

Step 4: Set and cost BEE targets

Step 5: Calculate and consolidate all costs

Step 6: Construct the PPP reference model and explain all assumptions and indicators

### Step 1: Confirm the type of PPP

There are two types of PPP defined by Treasury Regulation 16 to the PFMA: one involving the performance of an institutional function by a private party, and one involving the use of state property by a private party for its own commercial purposes. A project may be a hybrid of these types. Each type (or hybrid) may also have various characteristics, influenced largely by the expected sources of funding (see Step 2) and the anticipated payment mechanism (see Step 3).

Important considerations in confirming the PPP type will include:

- Which type is best suited to meeting the output specifications?
- What risks is the private party likely to take on?
- How much debt would be needed in the project?
- How long is the concession period?
- How will any assets in the project be treated? If ownership of an asset transfers between the institution and the private party at any stage during the project, how will residual values, depreciation, transfer costs and hand-back conditions be treated?

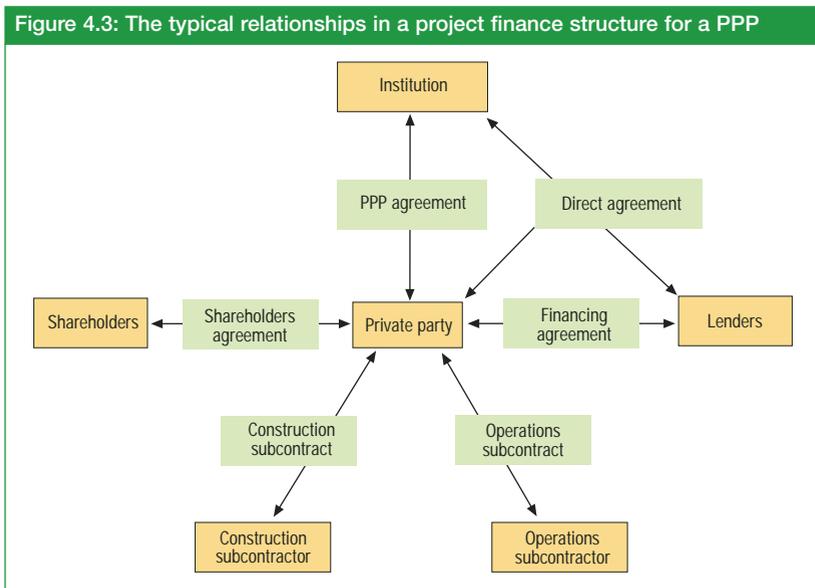
## Step 2: Describe the proposed PPP project structure and sources of funding

The proposed structure for the project needs to show the relationship between the institution, the special purpose vehicle (SPV) (if required), shareholders, lenders, suppliers, subcontractors and other players.

The proposed sources of funding (the combination of debt and equity, and (if appropriate) government contribution) must be identified and shown in a proposed funding structure.

Appropriate equity returns, and the costs and key terms of debt financing, including debt service cover ratios (if applicable) must be shown. All assumptions must be clearly stated, as these will directly affect the cost of capital for the project.

### Project finance structure<sup>10</sup>



In such a project finance structure, the following must be addressed:

- legal and financial structure and participants
- ratios such as: annual debt service cover ratio, project life cover ratio, loan life cover ratio, debt service reserve and maintenance reserve accounts, and the cash-flow waterfall arrangement.

10. See the preface to *Standardised PPP Provisions* for an explanation of the project finance structure, and see *Module 9: An Introduction to Project Finance*.

## **Corporate finance structure<sup>11</sup>**

Corporate finance should be treated as the exception for the structuring of PPP projects. It is used in projects with capital requirements below the levels at which project finance becomes cost-effective, but it carries different risks for the institution.

In a corporate finance structure, the following must be addressed:

- Project assets should be ring-fenced within the balance sheet of the private party to allow the institution to take security over project assets and to protect the institution in the event of termination.
- As a corporate finance project does not have the comfort of bank due diligence (as would be the case in project finance), the institution must expect to do a thorough due diligence on the project and take a long-term view on the balance sheet of the private party.
- Instead of being able to rely on a bank's vigilance over the private party's operations (as in a project finance structure), the onus will be on the institution to monitor, analyse and respond to any events or information which may impact on the project. The institution needs to demonstrate its capacity and skills to do so.
- In the base case financial model, the ratios relevant for a corporate finance structure are: liquidity, asset management, profitability and debt ratios.

## **Capital contribution by government**

Current international trends support the use of government funding in PPPs. The benefits include:

- dedicated funds available for construction
- reduced unitary payment and/or user charges
- lower cost of capital.

The limitations are:

- pre-funding of equity returns
- risk transfer inevitably compromised
- risk of separating construction from operations
- reduced lender involvement reduces attention to due diligence.

National Treasury's view is that the use of government funds for capital works should be considered on a clear demonstration of value for money. The contribution by government must not cover all capital costs; the funds should only be used for the provision of ring-fenced project assets that will either immediately or on termination of the PPP agreement become the property of the state, and the assets thus purchased cannot be used as security. If such a capital contribution is anticipated, the following need to be addressed in detail:

- budgetary requirements
- regulatory requirements and restrictions

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11. See the preface to *Standardised PPP Provisions* for an explanation of the corporate finance structure, and refer to *Module 9: An Introduction to Project Finance*.

- tax implications
- treatment of assets
- effect on the allocation of risk.

### **Step 3: Develop the core components of the payment mechanism**

Although the full payment mechanism is developed during the preparation of the request for proposals (RFP),<sup>12</sup> the feasibility study must develop the core components.

For a unitary payment arrangement, the following must be addressed:

- the amount of the single, indivisible unitary payment
- whether any splitting of the unitary payment between services is appropriate
- identifying the key areas of availability and performance of the services
- preparing an initial allocation of the proposed unitary payment to these areas in order to verify that the appropriate incentives and penalties are created for the service as a whole.

### **Step 4: Set and cost BEE targets**

Draft a proposed PPP BEE balanced scorecard<sup>13</sup> for the PPP using the elements specified in the *Code of Good Practice for BEE in PPPs*, taking account of the sector, proposed PPP project type, structure, sources of funding, and the BEE issues identified in stages 1 to 3 of the feasibility study.

Calculate how the private party would cost each of the BEE targets set for the project.

**The BEE work in the feasibility study phase is crucial to ensuring a sound BEE outcome in a PPP.**

Producing a proposed BEE PPP balanced scorecard for the project, through which BEE targets are appropriately set for the maturity of the market in which the project is to take place, will directly impact on the institution's ability to produce sound bid documentation for the PPP. Getting these targets right or wrong may significantly impact on the project's affordability and value for money, and the private party's willingness to assume risk – and will certainly impact directly on the sustainability of BEE in the project.

### **Step 5: Calculate and consolidate all costs**

The categories of costs covered in the PPP reference model must be the same as those in the PSC model – namely, direct capital, maintenance and operating costs, and indirect costs – and over a comparable period.

**The key difference is that the PPP reference model is expected to take into account the innovative design, construction and operational efficiencies that may realistically be expected of the private sector.**

<sup>12</sup>. See *Module 5: PPP Procurement: 'Annexure 1: Payment mechanism'*.

<sup>13</sup>. See *Module 2: Code of Good Practice for BEE in PPPs*.

Identify these efficiencies and use them as the basis for costing.

A notable inclusion in the PPP reference model is the cost of capital, which should be made up of the proposed debt and equity structuring of the project. Institutions should not assume that the cost of capital for the PPP reference model is linked to the government bond yield; the assumption should rather be that the project would rely on its own credit. The cost of capital must be justified by historical data and an analysis of project risk as perceived by potential funders.

The treatment of the residual value of the assets must be shown in the costing. (See Part 7: Step 2.)

The PPP reference model must also include, as separately identifiable line items, the costs of each targeted BEE element. (See Step 4.)

### **Step 6: Construct the PPP reference model and explain all assumptions and indicators**

The PPP reference model must be presented as a discounted cash-flow model, as with the PSC model.

As far as possible the PPP reference model must rely on the same assumptions as the PSC model, including the inflation and discount rates, which are particularly important for allowing for a proper comparison between the two procurement choices. The treatment of tax, VAT, depreciation, residual value and any other assumptions must be explained in detail.

A detailed narrative commentary on the model is required. It must explain the construction of the model and its key indicators, including the net present cost. Key indicators may be the debt/equity ratio, debt service cover ratio, liquidity, key sensitivities to inflation, project term, and tax.

## **Part 4: Construct the risk-adjusted PPP reference model**

### **Risk and the private sector**

The risks associated with the project do not disappear because the private sector is providing the service. But the same risks will typically entail lower costs for the private sector.

Risk is generally managed better in the private sector because of:

- a focus on outputs
- the economies of scale generated by integrating the design, building, financing and operation of assets
- the inventive use of assets
- innovative financial structuring
- managerial expertise.

It is necessary to do an independent risk assessment for the PPP reference model, using the costs that the private sector would usually apply to cater for the risk categories already identified for the project. This must be done by the institution's transaction advisor and backed up with a market testing exercise if necessary. The

risk matrix developed for the risk-adjusted PSC model (see Part 2), based on the Standardised PPP Risk Matrix (attached as Annexure 4), must therefore be used as reference.

While the risk categories are the same, they are dealt with differently in the two models. In the PSC model, risks are valued by assessing their cost, their likelihood of occurring and the costs of mitigation. The values are added to the base PSC model to create the risk-adjusted PSC model. In the PPP reference model, the PSC model's risk valuation process should not be necessary. Instead, because of the private sector's better capacity to manage risk, risk is incorporated into the costing of the project and should be reflected as:

- specific line items in the model dealing with direct risk-related costs (for example, insurance or guarantee costs)
- subcontractor costs
- increased required return on equity
- increased cost of debt.

In addition, the PPP reference model must reflect, as specific add-on costs, the risks retained by the institution. As in the risk-adjusted PSC model, the private sector will price risk transferred to it. Thus the risks which were allocated to the institution (the retained risks) in the risk matrix for the PSC model, must also be included in the PPP reference model.

Although the PPP reference model reflects an estimated private sector response to delivering the output specifications, there will still be some costs which the institution will be liable for in a PPP, such as the costs of managing the PPP agreement.<sup>14</sup> These costs must also be calculated and clearly identified in the PPP reference model.

Risk-adjusted PPP reference model = PPP reference model + retained risk

**The PPP reference model cost is thus an 'all-in' cost to the institution for undertaking the project through a PPP.**

The PPP reference model must clearly show what the proposed unitary payment will be to government for undertaking the project through a PPP.

## Part 5: Sensitivity analysis

**A sensitivity analysis determines the resilience of the base PSC model and the base PPP reference model to changes in the assumptions which the model has been based on.**

The institution and its transaction advisor should test the sensitivity of key variables to test their impact on affordability, value for money and risk, such as:

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<sup>14</sup>. See *Module 6: Managing the PPP Agreement*.

- project term
- inflation rate
- discount rate
- construction costs
- total operating costs
- BEE costs
- service demand
- third-party revenue, if any
- residual value
- financing terms.

For example, an increase in the assumed capital cost may lower an associated risk. This will allow the institution to view the potential spread of the total cost to government under the base PSC model.

It may be important to undertake a sensitivity analysis of the PPP reference model using both high and low discount rates in a range of bond yield rates. If both discount rates support or reject the value for money of the project (when the NPV of the PPP reference model is compared with the NPV of the PSC model), the result is clear. However, if only one of the discount rates meets the value-for-money criterion, the project should be further examined, taking into consideration the sensitivity of the independent variables and how they may affect the results.

#### Take note

A thorough sensitivity analysis on different variables must be presented as part of the feasibility study.

## Part 6: Demonstrate affordability

The budget for the project has been identified at various stages prior to this. At this stage, it must be scrutinised in detail and confirmed in order to demonstrate project affordability.

### Step 1: Determine the institutional budget available for the project

Institutions should refer to the *Estimates of National Expenditure* and their own detailed budgets. Include all the applicable available amounts, namely direct and indirect costs, and any third-party revenues. Where necessary, include budgetary allocations that would be available to the project from other institutional budgets (such as capital works allocations on the Public Works vote).

Most PPP projects, particularly those involving private capital investment, will extend beyond the three years of the MTEF. It will therefore be necessary for institutions to extrapolate their budgets beyond the MTEF to make meaningful comparisons with the cost of the PPP project. As a rule of thumb, it is prudent to assume that budgets remain constant in real terms (they increase only in line with

inflation) over the term of the project. Any different assumptions will need to be well argued and backed with documentation.

#### Take note

When assessing the institution's ability to pay for the project, ensure that all costs associated with the project have been taken into account. For example: In a school project, the private party may be required to supply the design, construction and maintenance of the school buildings, but the Department of Education may continue to provide teachers. The department must thus ensure that it has sufficient budget for not only the payment of the unitary payment to the private party for the design, construction and maintenance of the school, but also for its own teachers, who will work there. Costs of managing a PPP agreement must also be accounted for in the budget.

### **Step 2: Compare the risk-adjusted PPP reference model with the available institutional budget**

**If affordability cannot be demonstrated, the institution will be obliged either to re-examine and modify the output specifications within the affordability constraint, or to abandon the project.**

For example, if the output specification is 24 hours, 7-days-a-week coverage of all movements inside a prison and the model reveals that this is beyond the institution's budget for the project, the output specification might be modified to such coverage only in the high-security block. Any adjustments to output specifications must be reflected in adjustments to both the PSC model and the PPP reference model, in order to maintain comparability.

## **Part 7: Initial value-for-money test**

### Initial value-for-money test

Step 1: Check the models

Step 2: Establish the initial indication of value for money

Step 3: Assess BEE value for money

#### **Step 1: Check the models**

- Do the models (both PSC and PPP reference) reflect the requirements of the output specifications?
- Have all capital costs, operating and maintenance costs required to deliver the service according to the output specifications been included?
- Have all BEE targets been costed?
- Have all material and quantifiable risks been identified and accurately valued?
- Have all risks been summarised in the risk matrix, including their consequences, financial impacts and proposed mitigation strategies? Have all risks been appropriately assigned to the party best able to manage them?
- Has a sensitivity analysis been conducted on the key assumptions?
- Are all assumptions used reasonable and appropriate?

## Step 2: Establish the initial indication of value for money

Treasury Regulation 16.1 to the PFMA defines value for money as: ‘a net benefit to the institution, defined in terms of cost, price, quality, quantity, or risk transfer, or a combination thereof.’

The value-for-money test is only conducted in the procurement phase as one of the requirements for TA:IIB when private party bids are submitted. For TA:I, institutions are required to give an initial indication of what value for money the project is likely to provide if it were procured through conventional public sector procurement or a PPP, by comparing the two models. The models will also provide the critical benchmark for evaluating PPP bids during the procurement phase.

Value for money is considered at this stage by comparing the risk-adjusted PSC model to the risk-adjusted PPP reference model on a net present value (NPV) basis.

Figure 4.5: Value-for-money comparison

Value-for-money comparison	Public sector comparator	PPP reference
<b>Financial Model</b>		
Legal, financial, technical, commercial, socio-economic, institutional impact of the option		
Costs		
Assumptions for model (inflation, interest rate, tax, VAT, depreciation, budget and MTEF)		
Funding options		
Any contributions by government		
Net present cost	PSC	PPP-ref
<b>Risk adjustments</b>	RA	RA
Risk adjustments net present cost	RA-PSC	RA-PPP-ref

The use of **an NPV calculation** in determining the cost of a project is based on the premise that a Rand received today is more valuable than a Rand received at some future date. The timing of cash flows in the PPP reference model and the PSC model are often quite different from each other, and therefore difficult to compare without adjusting for the time value of money. By taking into account the time value of money, the discounted cash flow allows the private project proposals to be compared to each other and to the PSC model in the procurement phase.<sup>15</sup> Clearly, in order to compare the models, it is necessary to apply the same discount rate. It is acknowledged that the extent to which a Rand today is worth more than a Rand in future is determined by the discount rate used in calculating the NPV. (The use of a discount rate has been discussed in Part 1: Step 5, and is elaborated on in

15. See *Module 5: PPP Procurement*.

‘Annexure 2: The significance of the discount rate’.)

Also consider in this comparison, **the treatment of residual value of assets** created during the project. Where the PPP does not pass residual value risk to the private party, an asset simply returns to the institution for zero or nominal consideration and the private party must earn a return on its initial investment through the service charges payable. However, the institution is left with an asset with a remaining useful economic life and theoretically there should be a deduction from the NPV of the service charges to reflect the lower true net cost of the services provided under the contract. Where such a deduction is made from the cost of the PPP an equivalent deduction should be made from the PSC model. In each case the market value of the asset is the appropriate figure. As there is unlikely to be a material difference between these two estimates it is usually legitimate to exclude the residual value on the grounds that it will not affect the comparison. The key point is to achieve consistency of approach, namely, either include a deduction for residual value in both calculations or exclude it in both calculations. Where the PPP contract does involve residual risk being passed to the private party the institution will usually have the option to pay an amount equal to market value at the end of the contract in order to retain the asset, or to pay nothing and leave the asset with the private party. In this case, no residual value deduction is needed from the NPV of the service payments to calculate the NPV of the services under the PPP. However, for the PSC model calculation, an assumption would have to be made regarding the deduction needed to avoid overstating the cost of services.

### **Step 3: Assess BEE value for money**

Make a value-for-money assessment of which procurement choice is going to best achieve the BEE outcomes that the institution targeted for the project.

## **Part 8: Make the procurement choice**

If the PPP reference model shows that the project is affordable as a PPP and there is reasonable indication that a PPP will result in a lower net present cost to the institution (hence greater value for money) than a public procurement, with a value-for-money BEE outcome, then the institution should procure a PPP.

## **Part 9: Verify information and sign off**

### **Verify information and sign off**

Step 1: Verify the information used in the feasibility study

Step 2: Draw up a checklist for legal compliance

Step 3: Sign off the feasibility study

### **Step 1: Verify the information used in the feasibility study**

Constructing the PSC and PPP reference models and developing the risk matrix are information-intensive exercises. The conclusions which will be drawn from the models are highly dependent on the quality and accuracy of the information they are based on. All PPP projects are subject to an annual audit by the Auditor-General.<sup>16</sup> For this reason, and because the models will need to be referred to throughout the procurement phase, it is necessary to provide the following information, as an annexure to the feasibility study:

- **A statement from the institution and its transaction advisor on the reasonableness of the information collected.** Describe the process by which the transaction advisor collected the information. Demonstrate that the information collected and used was realistic and sensible.
- **A statement of qualification from the transaction advisor about whether value for money could have been enhanced.** In many cases, an institution's strategic objectives may prescribe how a potential PPP can be structured, which may result in a particular level of value for money. It is the transaction advisor's responsibility to point out to institutions how value for money might be enhanced, and to record what different combinations of public private solutions might have been explored to optimise the institution's desired outcomes.
- **A description of how the assumptions used in constructing the PSC and PPP reference model are realistic and appropriate,** taking into account past practice, performance, current practice and anticipated future developments. For complex projects or projects where there is little precedent, it is strongly recommended that an independent party checks that the assumptions are reasonable, and confirms that they have been correctly incorporated into the model to produce an accurate result (arithmetic and logic). This may have cost and time implications.
- **A record of the methodologies used for valuing various costs,** including the costs of key risks.
- **A statement on how an audit trail of all documentation has been established and maintained to date,** and how it will be managed throughout the project. This is an essential requirement, especially for the purposes of the Auditor-General and in terms of the Promotion of Access to Information Act, 2000.

### **Step 2: Draw up a checklist for legal compliance**

Legal advisors must draw up a checklist for legal compliance. (This may be a summary of work undertaken during Stage 3.)

### **Step 3: Sign off the feasibility study**

All inputs into the feasibility study must be signed off as accurate and verifiable by each of the transaction advisor specialists.

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<sup>16</sup>. See *Module 7: Auditing PPPs*.

## Requirements for the feasibility study report: Value assessment

- PSC model
  - Technical definition of project
  - Discussion on costs (direct and indirect) and assumptions made on cost estimates
  - Discussion on revenue (if relevant) and assumptions made on revenue estimates
  - BEE targets
  - Discussion on all model assumptions made in the construction of the model, including inflation rate, discount rate, depreciation, budgets and MTEF
  - Summary of results from the base PSC model: NPV
- PPP reference
  - Technical definition of project
  - Discussion on costs (direct and indirect) and assumptions made on cost estimates
  - Discussion on revenue (if relevant) and assumptions made on revenue estimates
  - Discussion on proposed PPP type
  - BEE targets
  - Proposed PPP project structure and sources of funding
  - Payment mechanism
  - Discussion on all model assumptions made in the construction of the model, including inflation rate, discount rate, depreciation, tax and VAT
  - Summary of results from the PPP-reference model: NPV
- Risk assessment
  - Comprehensive risk matrix for all project risks
  - Summary of the institution's retained and transferable risks
  - The NPV of all risks (retained and transferable) to be added onto the base PSC model
  - The NPV of all retained risks to be added onto the PPP reference model
- Risk-adjusted PSC model
  - Summary of results: NPV
- Risk-adjusted PPP-reference
  - Summary of results: NPV, key indicators
  - Sensitivity analysis
  - Statement of affordability
  - Statement of value for money
  - Recommended procurement choice
- Information verification
  - Summary of documents attached in Annexure 1 to verify information found in the feasibility study report

## STAGE 5: ECONOMIC VALUATION

### Take note

A project which is not economically viable will not easily be awarded TA:I.

An economic valuation may be warranted in:

- greenfield projects
- capital projects
- projects that warrant an analysis of externalities (such as major rail, port, airport projects).

A range of well-known micro-economic techniques exists for undertaking an economic valuation, requiring the analysis to:<sup>17</sup>

- Give a clear economic rationale for the project.
- Identify and quantify the economic consequences of all financial flows and other impacts of the project.
- Detail the calculation or shadow prices/opportunity costs for all inputs and outputs, including:
  - foreign exchange
  - marginal cost of public funds
  - opportunity cost of public funds (discount rate)
  - high, medium and low skill labour
  - tradable and non-tradable inputs
  - tradable and non-tradable outputs (including consumer surplus, where relevant, based on financial or other model quantities).
- Identify an appropriate ‘no-project’ scenario and calculate the associated economic flows, treating them as opportunity costs to the project. (A ‘no-project’ scenario is not the same as a PSC model.)
- Identify the economic benefits to BEE, and the opportunity costs to BEE of a ‘no-project’ scenario.
- Provide a breakdown of the economic costs and benefits of the project into its financial costs and benefits, and various externalities.
- Do a detailed stakeholder analysis, including the project entity, private sector entity, government, and others.

### Submission requirements: Economic valuation

- Introduction and valuation approach
- Assumptions
- Valuation results

17. Refer to sections 38 (1) and 51(1) of the PFMA when undertaking the economic valuation.

## STAGE 6: PROCUREMENT PLAN

**A procurement plan demonstrates that the institution has the necessary capacity and budget to undertake the procurement of the PPP.**

A procurement plan must contain at least the following:

- a project timetable for the key milestones and all approvals which will be required to take the project from TA:I to TA:III
- confirmation that sufficient funds in the institution's budget are available<sup>18</sup> to take the project to TA:III and into contract implementation
- a list of any potential challenges to the project and a discussion on how these will be addressed by the project team and transaction advisor
- the best procurement practice and procedures suited to the project type and structure
- the governance processes to be used by the institution in its management of the procurement, especially regarding decision-making
- the project stakeholders and the extent of their involvement in the PPP
- the project team with assigned functions
- categories of information to be made available to bidders and how such information will be developed
- a list of required approvals from within and outside the institution
- a GANTT chart of the procurement process, including all approvals and work items necessary for obtaining these approvals (for procurement documentation as well as, for example, the land acquisitions and environmental studies to be procured by the institution)
- contingency plans for dealing with deviations from the timetable and budgets
- the bid evaluation process and teams
- an appropriate quality assurance process for procurement documentation
- the means of establishing and maintaining an appropriate audit trail for the procurement
- appropriate security and confidentiality systems, including confidentiality agreements, anti-corruption mechanisms, and conflict of interest forms to be signed by all project team members.

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18. See *Module 3: PPP Inception for information on funding for transaction advisor costs from the Project Development Facility (PDF)*.

# STAGE 7: SUBMIT THE FEASIBILITY STUDY REPORT

Submit the feasibility study report to the head of the relevant treasury, with all the information arranged as it is set out in the list of submission requirements below. The contents page of the report should thus mirror this list.

## Take note

The feasibility study report must provide as much information as is necessary for the relevant treasury to assess the merits of the project.

Submit as much information as possible, making use of annexures which have been referenced in the appropriate section of the main part of the report. All documents that have informed the feasibility study and are of decision-making relevance to the project must be part of the feasibility study report.

The feasibility study report must be submitted as a single report with its annexures.

The report must not refer to any document that has not been submitted as part of the report.

## 1. Contents of the report

### Introduction

#### Submission requirements

- Covering letter from the accounting officer/authority requesting TA:I
- Executive summary
- Introduction
- Project background
- Approach and methodology to the feasibility study

### Section 1

#### Submission requirements: Needs analysis

- Institution's strategic objectives
- Budget
- Institutional analysis
- Output specifications
- Scope of the project

### Section 2

#### Submission requirements: Solution options analysis

- Options considered
- Evaluation and assessment of each option
- Summary of evaluation and assessment of all options considered
- Recommendation of a preferred option

### **Section 3**

#### **Submission requirements: Project due diligence**

- Legal aspects
  - Use rights
  - Regulatory matters
- Site enablement
- Socio-economic and BEE

### **Section 4**

#### **Submission requirements: Value assessment**

- PSC model
  - Technical definition of project
  - Discussion on costs (direct and indirect) and assumptions made on cost estimates
  - Discussion on revenue (if relevant) and assumptions made on revenue estimates
  - BEE targets
  - Discussion on all model assumptions made in the construction of the model, including inflation rate, discount rate, depreciation, budgets and MTEF
  - Summary of results from the base PSC model: NPV
- PPP reference model
  - Technical definition of project
  - Discussion on costs (direct and indirect) and assumptions made on cost estimates
  - Discussion on revenue (if relevant) and assumptions made on revenue estimates
  - Discussion on proposed PPP type
  - BEE targets
  - Proposed PPP project structure and sources of funding
  - Payment mechanism
  - Discussion on all model assumptions made in the construction of the model, including inflation rate, discount rate, depreciation, tax and VAT
  - Summary of results from the PPP-reference model: NPV
- Risk assessment
  - Comprehensive risk matrix for all project risks
  - Summary of the institution's retained and transferable risks
  - The NPV of all risks (retained and transferable) to be added onto the base PSC model
  - The NPV of all retained risks to be added onto the PPP reference model
- Risk-adjusted PSC model
  - Summary of results: NPV
- Risk-adjusted PPP reference model
  - Summary of results: NPV, key indicators
  - Sensitivity analysis
  - Statement of affordability
  - Statement of value for money

- Recommended procurement choice
- Information verification
  - Summary of documents attached in Annexure 1 to verify information found in the feasibility study report

## **Section 5**

### **Submission requirements: Economic valuation**

- Introduction and valuation approach
- Assumptions
- Valuation results

## **Section 6**

### **Submission requirements: Procurement plan**

### **Annexures**

Annexure 1: Statements for information verification and sign-off from each advisor to the project

Annexure 2: Letter of concurrence from CFO of institution and/or provincial treasury<sup>19</sup>

Annexure 3: PSC model

Annexure 4: PPP reference model

Annexure 5: Risk assessment and comprehensive risk matrix

Annexure 6: Document list (list of all documents related to the project, where they are kept, and who is responsible for ensuring that they are updated)

Annexure 5, 7, 8, 9 etc: Attach as annexures all other documents that have informed the feasibility study and that are of decision-making relevance to the project.

## **2. Electronic format requirements**

All electronic files must be labelled clearly to reflect their contents and dated as the final version. Text-based files must be in Microsoft Word and all financial models must be in Microsoft Excel.

The financial models must be sufficiently adaptable for use by others at later stages. Sheets must be logically ordered and labelled and inputs into the model clearly identified. Formulas should have as little hard coding as possible. If possible, key inputs should be able to be changed by the relevant treasury in the model itself to test different scenarios and the veracity of the model.

The institution and its transaction advisor may be requested to present the feasibility study report to the relevant treasury using PowerPoint.

The executive summary and PowerPoint presentation must be compiled in such a way that they can be used by the institution's management for decision-making purposes.

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19. If Treasury approvals for PPPs have been delegated to a provincial treasury in terms of the PFMA, its concurrence here is not applicable.

## STAGE 8: REVISITING THE FEASIBILITY STUDY

### Extract from Treasury Regulation 16 to the PFMA

16.4.4 *If at any time after Treasury Approval: I has been granted in respect of the feasibility study of a PPP, but before the grant of Treasury Approval: III in respect of the PPP agreement recording that PPP, any assumptions in such feasibility study are materially revised, including any assumptions concerning affordability, value for money and substantial technical, operational and financial risk transfer, then the accounting officer or accounting authority of the institution must immediately –*

- (a) provide the relevant treasury with details of the intended revision, including a statement regarding the purpose and impact of the intended revision on the affordability, value for money and risk transfer evaluation contained in the feasibility study; and*
- (b) ensure that the relevant treasury is provided with a revised feasibility study after which the relevant treasury may grant a revised Treasury Approval: I.*

#### Take note

The requirement is thus not to revisit the feasibility study only prior to financial closure, but at any time that any assumptions may differ materially from the original assumptions.



# ANNEXURES

ANNEXURE 1		
A PSC model		48
ANNEXURE 2		
The significance of the discount rate		55
ANNEXURE 3		
How to calculate the value of risk		59
ANNEXURE 4		
Standardised PPP Risk Matrix		63

# A PSC MODEL

## Example: Providing a hospital and related services<sup>20</sup>

### Overview

#### Output specifications<sup>21</sup>

The Gauteng Department of Health needs to provide a hospital and related services (to include medical equipment, catering and parking) in the Ekurhuleni area. The department has decided that the outputs will not include the provision of core medical services and direct patient care. The hospital must cater for 300 beds. The project term is assumed to be 12 years with a construction period of two years.

#### Options analysis

The solution options the department looked at were to build a new hospital in the area or to renovate and upgrade another hospital 40km away. For a variety of reasons, building a new hospital in the area was the preferred option.

The base PSC model assumes that the department will appoint a contractor for the design and construction work through a conventional public sector procurement process. All operational and maintenance work will be undertaken by the department itself.

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20. This example is of a typical PSC model, but should not be copied or used as a template. It has been adapted from *Partnerships Victoria: Public Sector Comparator Technical Note*, published by the Department of Treasury and Finance, State of Victoria, Melbourne, Australia, in June 2001.

21. If the needs analysis and the options analysis have been conducted separately from the rest of the feasibility study it is necessary to provide a brief overview here, restating the output specifications, the options analysed and the preferred option, before embarking on the requirements of the value for money, affordability and risk assessment. If considerable time has passed, the social, economic and political conditions may have changed. The objective and scope of the project will then need to be re-examined.

## Costs and revenue

The costs for the base PSC model are based on the recent building of a hospital elsewhere in South Africa, and on the expert research and opinion of the department's transaction advisor.

Costs	Amount (R million)	Description
<b>Direct capital costs</b>		
Land acquisition and development	5.0	The market price for the land
Design and construction contract price <sup>22</sup>	100.0	Based on a recent bid for a similar construction project
Payment to consultants	10.0	Legal advisors, engineers, town planners, etc
Plant and equipment	50.0	Current market price for medical, catering and cleaning equipment
Capital upgrade of facility expected in year 5	15.0	
Capital expenditure over project cycle	40.0	Three-year capital expenditure cycles, once operation of the hospital begins, in years 5, 8 and 11
<b>Direct maintenance costs</b>		
Maintenance and repairs on buildings, plant and equipment	4.0 p.a.	
<b>Direct operating costs</b>		
Personnel (wages, salaries and benefits)	5.0 p.a.	
Running costs (water, electricity, telephone, etc.)	2.0 p.a.	
Management	1.0 p.a.	
<b>Indirect costs</b>		
Project management overheads	1.0 p.a.	Cost of managing the project during the construction period
Operating overheads	0.2 p.a.	Portion of department's costs attributable to the new hospital
Administration overheads	0.5 p.a.	Cost of ongoing facilities and project management
<b>Third party revenue</b>		
Revenue expected	5.0 p.a.	From car parking fees and retail (net of costs)

## Assumptions

Assumptions	Amount (R million)	Description
<b>Budget</b>	R33m p.a.	Budget available to the department
<b>Inflation</b>	6% p.a.	Assumed to increase at 6% p.a. on all costs
<b>Discount rate</b>	10%	An assumed rate for the purposes of this example

22. When constructing the PSC, the impact of the Preferential Procurement Policy Framework Act, 2000 (PPPFA) 90:10 formula should be included in costing the project's BEE targets. The PPPFA places a ceiling on the price premium for BEE on all goods and services contracted through conventional procurement.

## Discounted cash-flow model

Base PSC: Cash-flow timing profile													
	Year												
	0	1	2	3	4	5	6	7	8	9	10	11	12
<b>DIRECT COSTS</b>													
Capital costs													
Land costs	100%												
Design and construction contract price	15%	35%	35%	15%									
Payments to consultants	33%	33%	33%										
Plant and equipment	10%	30%	60%										
Capital upgrade						100%							
Life-cycle capital expenditure						33%			33%			33%	
<b>Maintenance costs</b>				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Operating costs</b>													
Wages and salaries				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Running costs				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Management costs				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>INDIRECT COSTS</b>													
Construction overhead costs	100%	100%	100%										
Operating overhead costs				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Administrative overhead costs				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>LESS</b>													
Third-party revenue				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Base PSC: Nominal cash-flow (R thousands)													
	Year												
	0	1	2	3	4	5	6	7	8	9	10	11	12
<b>DIRECT COSTS</b>													
Capital costs													
Land costs	5,000												
Design and construction contract price	15,000	55,650	39,326	17,865									
Payments to consultants	3,333	3,533	3,745										
Plant and equipment	5,000	15,900	33,708										
Capital upgrade						20,073							
Life-cycle capital expenditure						17,665			21,039			25,058	
<b>Maintenance costs</b>				4,764	5,050	5,353	5,674	6,015	6,375	6,758	7,163	7,593	8,049
<b>Operating costs</b>													
Wages and salaries				5,955	6,312	6,691	7,093	7,518	7,969	8,447	8,954	9,491	10,061
Running costs				2,382	2,525	2,676	2,837	3,007	3,188	3,379	3,582	3,797	4,024
Management costs				1,191	1,262	1,338	1,419	1,504	1,594	1,689	1,791	1,898	2,012
<b>INDIRECT COSTS</b>													
Construction overhead costs	1,000	1,060	1,124										
Operating overhead costs				238	252	268	284	301	319	338	358	380	402
Administrative overhead costs				596	631	669	709	752	797	845	895	949	1,006
<b>LESS</b>													
Third-party revenue				5,955	6,312	6,691	7,093	7,518	7,969	8,447	8,954	9,491	10,061
<b>Subtotal: Base PSC</b>	29,333	76,143	77,903	27,036	9,721	48,042	10,923	11,578	33,311	13,009	13,790	39,674	15,494
Discount factor: 10%	1.0	0.91	0.83	0.75	0.68	0.62	0.56	0.51	0.47	0.42	0.39	0.35	0.32
<b>Discounted cash flow</b>	29,333	69,221	64,383	20,313	6,640	29,830	6,166	5,941	15,540	5,517	5,316	13,906	4,937
NPV of base PSC	277,043												

## Risk valuation

	Effect on PSC base cost assumption	Impact of risk (R 000s)	Likelihood of risk occurring (%)	Value of risk (R 000s)
<b>Design and construction (D&amp;C) risk</b>				
Cost overrun (percentage of D&C cost: R100m)				
Below base PSC	-5%	-5,000	5%	-250
No change from base PSC	0%	-	10%	-
Overrun: Likely	15%	15,000	50%	7,500
Overrun: Moderate	30%	30,000	20%	6,000
Overrun: Extreme	40%	40,000	15%	6,000
				19,250
Time overrun (% of D&C Cost: R100m)				
No time overrun	0%	-	15%	-
Overrun: Likely	10%	10,000	50%	5,000
Overrun: Moderate	15%	15,000	25%	3,750
Overrun: Extreme	20%	20,000	10%	2,000
* Likely: 1 year delay. Moderate: 1.5 year delay. Extreme: 2 year delay				10,750
Provision of similar service (R5m per year during delay)				
No delay	0%	-	25%	0.0
Cost: Likely	100%	5,000	40%	2,000
Cost: Moderate	200%	10,000	30%	3,000
Cost: Extreme	200%	10,000	5%	500
* Likely: 1 year delay. Moderate: 1.5 year delay. Extreme: 2 year delay				5,500
Upgrade costs (% of project cycle capital expenditure: R40m)				
Below base PSC	-5%	-2,000	5%	-100
No change from base PSC	0%	-	10%	-
Overrun: Likely	15%	6,000	50%	3,000
Overrun: Moderate	30%	12,000	20%	2,400
Overrun: Extreme	40%	16,000	15%	2,400
				7,700
Operating risk (% of direct operating costs: R8.25m p.a.)				
Below base PSC	-5%	-413	5%	-21
No change from base PSC	0%	-	25%	-
Overrun: Likely	15%	1,238	40%	495
Overrun: Moderate	30%	2,475	25%	619
Overrun: Extreme	40%	3,300	5%	165
				1,258
Performance risk (R5m p.a. for underperformance)				
No deviation	0%	-	70%	0.0
Overrun: Likely	100%	5,000	30%	1,500
Overrun: Moderate	0%	-	0%	-
Overrun: Extreme	0%	-	0%	-
				1,500
Maintenance risk				
General maintenance risk (% of maintenance cost: R4m per year)				
Below base PSC	-5%	-160	5%	-8
No change from base PSC	0%	-	25%	-
Overrun: Likely	15%	480	40%	192
Overrun: Moderate	30%	960	25%	240
Overrun: Extreme	40%	1,280	5%	64
Assume 80% of hospital is general area, thus base is 80% of R4m per year				488
Patient area maintenance risk (percentage of maintenance cost: R4m per year)				
Below base PSC	-5%	-40	5%	-2
No change from base PSC	0%	-	15%	-
Overrun: Likely	45%	360	45%	162
Overrun: Moderate	75%	600	25%	150
Overrun: Extreme	120%	960	10%	96
Assume 20% of hospital is patient area, thus base is 20% of R4m per year				406
Technology risk (percentage of plant and equipment: R50m)				
Below base PSC	-20%	-10,000	20%	-2,000
No change from base PSC	0%	-	10%	-
Overrun: Likely	30%	15,000	40%	6,000
Overrun: Moderate	40%	20,000	20%	4,000
Overrun: Extreme	50%	25,000	10%	2,500
				10,500

Base PSC: Nominal cash flow (R thousands)													
RISK	Year												
	0	1	2	3	4	5	6	7	8	9	10	11	12
<b>Design and construction risk</b>													
Cost overrun		3,061	7,570	8,024	3,645								
Time overrun			1,613	3,763	3,763	1,613							
Similar service provision			825	1,925	1,925	1,925							
Upgrade cost			8,652										
<b>Operating risk</b>				1,498	1,588	1,684	1,785	1,892	2,005	2,126	2,253	2,388	2,532
Performance risk				1,787	1,894	2,007	2,128	2,255	2,391	2,534	2,686	2,847	3,018
<b>Maintenance risk</b>													
General maintenance risk				581	616	653	692	734	778	824	874	926	982
Patient area maintenance risk				484	513	543	576	610	647	686	727	771	817
<b>Technology risk</b>				1,251	1,326	1,405	1,182	1,253	1,328	1,408	1,492	1,582	1,677
Subtotal: Risk	-	3,061	18,659	19,312	15,269	9,830	6,363	6,744	7,149	7,578	8,033	8,515	9,026
Discount factor: 10%	1.0	0.91	0.83	0.75	0.68	0.62	0.56	0.51	0.47	0.42	0.39	0.35	0.32
Discounted cash flow	-	2,783	15,421	14,510	10,429	6,104	3,592	3,461	3,335	3,214	3,097	2,984	2,876
Present value of risk	71,805												

## Risk-adjusted PSC model

Base PSC: Nominal cash flow (R thousands)													
	Year												
	0	1	2	3	4	5	6	7	8	9	10	11	12
Direct capital costs	28,333	75,083	76,779	17,865	-	37,738	-	-	21,039	-	-	25,058	-
Direct maintenance costs				4,764	5,050	5,353	5,674	6,015	6,375	6,758	7,163	7,593	8,049
Direct operating costs	-	-	-	9,528	10,100	10,706	11,348	12,029	12,751	13,516	14,327	15,186	16,098
Indirect costs	1,000	1,060	1,124	834	884	937	993	1,053	1,116	1,183	1,254	1,329	1,409
Less: Third-party revenue	-	-	-	5,955	6,312	6,691	7,093	7,518	7,969	8,447	8,954	9,491	10,061
Subtotal: Base PSC	29,333	76,143	77,903	27,036	9,721	48,042	10,923	11,578	33,311	13,009	13,790	39,674	15,494
Risk value	-	3,061	18,659	19,312	15,269	9,830	6,363	6,744	7,149	7,578	8,033	8,515	9,026
Total cash flows	29,333	79,204	96,562	46,348	24,990	57,872	17,285	18,322	40,461	20,587	21,822	48,189	24,520
Discount rate: 10%	1.0	0.91	0.83	0.75	0.68	0.62	0.56	0.51	0.47	0.42	0.39	0.35	0.32
Discounted cash flows	29,333	72,004	79,804	34,822	17,069	35,934	9,757	9,402	18,875	8,731	8,413	16,890	7,813
Present value of risk-adjusted PSC	R348,847												

## Risk matrix

Risk	Description	Consequence	Risk value (R thousands)	Mitigation	Allocation	Risk tracking (RFP and negotiation)
1. Design and construction risk	The risk that the construction of the physical assets is not completed on time, budget or to specification.	Cost and delay	43,200	Private party may pass risk to subcontractor but maintain primary liability. Institution will not pay until service commencement.	Generally allocated to Private Party (PP)	
1.1 Cost overruns	1.1.1 Increase in the construction costs assumed in base PSC model.	Cost	19,250	PP in fixed term, fixed price contract with subcontractor.	Transfer: PP (PP may pass risk onto subcontractor but remains liable for risk.)	
1.2 Time overruns	1.2.1 Increase in the construction costs assumed in base PSC model as a result of delay in the construction schedule	Delay resulting in additional cost	10,750	Institution will not pay until service commencement.	Transfer: PP + pass on to subcontractor	
	1.2.2 Cost of interim solution. Results in additional cost of maintaining existing building or providing a temporary solution due to inability to deliver new facility as planned.	Cost of interim solution	5,500		Transfer: PP	
1.3 Upgrade costs	1.3.1 Increase in construction costs if the planned facility is not sufficient and additional capacity needs to be added.	Cost of upgrades	7,700	Minimise likelihood by ensuring specifications meet Institution's needs; careful planning of Institution's likely output requirements over term of contract.	Retain: Institution	
2. Operating risk	The risk that required inputs cost more than anticipated; are inadequate quality or are unavailable.	Cost increases and may impact on quality of service. Cost p.a.	1,258	Managed by PP through supply contracts to assure quality/quantity. Can be addressed in design.	Transfer: PP	
3. Performance risk	Risk that services may not be delivered to specification	Service unavailability. Inability of Institution to deliver public service. Alternate arrangements may need to be made to ensure service delivery, with additional costs. Cost p.a.	1,500	Institution to carry out due diligence on selected PP for capacity. Guarantees and assurances by PP. Penalties for underperformance. Termination of agreement.	Transfer: PP	
4. Maintenance risk	Risk that design/construction is inadequate and results in higher than anticipated maintenance costs. Higher maintenance costs generally.	Cost increases. May impact on Institution's ability to deliver public services.	894	PP to manage through long-term supply and subcontracts.	Generally transfer: PP	
4.1 General maintenance risk	Risk that design/construction is inadequate and results in higher than anticipated maintenance costs in general area. Higher maintenance costs generally.	Cost increases. May impact on Institution's ability to deliver public services. Cost p.a.	488	PP to manage through long-term supply and subcontracts.	Transfer: PP	

ANNEXURE 1: A PSC MODEL

Risk	Description	Consequence	Risk value (R thousands)	Mitigation	Allocation	Risk tracking (RFP and negotiation)
4.2 Patient area maintenance risk	Risk of higher than anticipated maintenance costs in patient area for which Institution is responsible.	Cost increases. May impact on Institution's ability to deliver public services. Cost p.a.	406	Institution to ensure design is able to accommodate planned maintenance.	Retained: Institution	
5. Technology risk	Risk that technical inputs may fail to deliver required output specs or technological improvements may render the technology inputs in the project out-of-date.	Cost increases.	10,500	Obligation on PP to refresh technology. Penalty deductions for failure to meet output specifications.	Transfer: PP	

# THE SIGNIFICANCE OF THE DISCOUNT RATE

## Introduction

The PSC and PPP reference models are based on a discounted cash-flow (DCF) analysis, which sees the cost of a project as the net present value (NPV) of its future cash flows. Cash flows are forecast over the life of the project and then adjusted to a common reference date. The sum of the discounted cash flows for the full term of the project gives its NPV a Rand figure.

### The formula for calculating the NPV

$$\text{NPV} = \text{CFn} * [1/(1 + r)^n]$$

CF = cash flow for each period of the project

r = discount rate

n = number of periods over which the project is being considered

The NPV is a useful measure because it is easily interpreted and readily comparable to other projects or bids modelled in the same way for the same reference date. For example, the timing of the cash flows for a PPP and conventional public sector procurement are often quite different and therefore difficult to compare. Discounted cash flows take into account the time value of money, making the NPVs comparable. In the feasibility study phase, the NPVs of the PSC and PPP reference models need to be compared. In the procurement phase, the NPVs of the various private bids will be compared with each other and with the PSC model.<sup>23</sup>

## The discount rate

A Rand today is more valuable than a Rand at some future date. The discount rate is a measure of this time preference of money: the extent to which that Rand loses value over time. The higher the discount rate the less significant the present value of a Rand will be in the future. By the same token, the lower the discount rate, the higher the present value of the Rand will be in the future, although it always will be less than a Rand today. It is critical that an appropriate discount rate be used when constructing the discounted cash-flow models for the PSC and PPP reference models.

(There are several methods for determining an appropriate discount rate. National Treasury's recommendations are set out under Stage 4: Part 1.)

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23. See *Module 5: PPP Procurement*.

**Example 1: The effect of different discount rates on the value of cash flow**

Example 1 shows the effect of a change in the discount rate on the value of a constant cash flow of R100 per year for 15 years (including year 0). As the discount rate increases, the cumulative value of the cash flow decreases (shown at the bottom of the table). This is due to the reduced significance of the cash flows as time goes by. Therefore, the net present value (NPV) of a cash flow with a 20 per cent discount rate is about 50 per cent of the value of the same cash flow using a five per cent discount rate over 15 years.

Example 1						
Year	Cash flow	Discount rate				
		0%	5%	10%	15%	20%
0	100	100	100	100	100	100
1	100	100	95	91	87	83
2	100	100	91	83	76	69
3	100	100	86	75	66	58
4	100	100	82	68	57	48
5	100	100	78	62	50	40
6	100	100	75	56	43	33
7	100	100	71	51	38	28
8	100	100	68	47	33	23
9	100	100	64	42	28	19
10	100	100	61	39	25	16
11	100	100	58	35	21	13
12	100	100	56	32	19	11
13	100	100	53	29	16	9
14	100	100	51	26	14	8
<b>Total</b>	<b>1,500</b>	<b>1,500</b>	<b>1,090</b>	<b>837</b>	<b>673</b>	<b>561</b>

**Example 2: The effect of different cash flows on the value of cash flow**

On the other hand, Example 2 shows the effect of a change in cash flow on the value of discount cash flows. In all three scenarios, the aggregate value of the cash flows is R1,500 and the discount rate is 10 per cent. The value of a back-loaded cash flow, as seen in scenario B, is significantly less (about 1/3) than the value of the front-loaded cash flow in scenario C.

The concepts described above are applied in the following two examples. The significance of cash flows and the discount rate for analysing projects is clear.

## Example 2

Year	Scenario A		Scenario B		Scenario C	
	Cash flow	Discount cash flow (discount rate: 10%)	Cash flow	Discount cash flow (discount rate: 10%)	Cash flow	Discount cash flow (discount rate: 10%)
0	100	100	5	5	195	195
1	100	91	5	5	195	177
2	100	83	5	4	195	161
3	100	75	5	4	195	147
4	100	68	5	3	195	133
5	100	62	100	62	100	62
6	100	56	100	56	100	56
7	100	51	100	51	100	51
8	100	47	100	47	100	47
9	100	42	100	42	100	42
10	100	39	195	75	5	2
11	100	35	195	68	5	2
12	100	32	195	62	5	2
13	100	29	195	56	5	1
14	100	26	195	51	5	1
Total	1,500	837	1,500	593	1,500	1,080

**Example 3: Project generating insufficient revenue to cover costs**

The discounted cash flow in Example 3 is for a service for which the institution will be required to pay regularly over the 10-year life of the project. Any revenues (taxes and/or fees) that may be generated by the institution in providing the service are insufficient to cover the cost of the service. It should also be noted that the PSC model reflects a capital cost to the department in the first year (year 0), while the private sector project (Project A) will be responsible for financing the project and will recover the cost of the financing and the principal throughout the life of the project. An example of a PPP that would have these characteristics is an IT project that would require a significant capital investment at the beginning of the project if undertaken by the institution on its own behalf. If the IT project is undertaken by a private sector provider, it would finance the project and settle the financing over the life of the project.

## Example 3

Year	PSC			Project A		
	Net cash flow	Discount rate 10%	Net present value of cash flow	Net cash flow	Discount rate 10%	Net present value of cash flow
0	R2,500	1.00	R2,500	R500	1.00	R500
1	R450	0.91	R409	R550	0.91	R500
2	R400	0.83	R331	R600	0.83	R496
3	R300	0.75	R225	R650	0.75	R488
4	R300	0.68	R205	R650	0.68	R444
5	R300	0.62	R186	R650	0.62	R404
6	R300	0.56	R169	R650	0.56	R367
7	R300	0.51	R154	R650	0.51	R334
8	R300	0.47	R140	R650	0.47	R303
9	R350	0.42	R148	R650	0.42	R276
10	R375	0.39	R145	R650	0.39	R251
Total	R5,875		R4,612	R6,850		R4,362

Note that even though the cost of the project, in absolute terms, is greater for Project A than for the PSC (R6,850 vs. R5,875), the discounted cost of Project A is R250 less than if the institution were to undertake the project on its own behalf.

#### Example 4: Project generating revenue in excess of costs

In Example 4 the DCF is that of a 10-year project in which the institution continues receiving fees in excess of costs on providing an existing service. The private sector party, which will also benefit from the fees collected, will in turn pay the institution for the use of its assets and rights to the concession. An example of a PPP that may have these characteristics would be the granting of a concession on a toll road or port, in which the project revenues are derived from the fees charged to the users of the service. In this example, although the NPV of the future cash flow is slightly greater should the institution retain the service (PSC), the total value (not discounted) of the private sector providing the service will be greater.

Example 4						
Year	PSC			Project B		
	Net cash flow	Discount rate 10%	Net present value of cash flow	Net cash flow	Discount rate 10%	Net present value of cash flow
0	R500	1.00	R500	R350	1.00	R350
1	R500	0.91	R455	R400	0.91	R364
2	R500	0.83	R413	R450	0.83	R372
3	R500	0.75	R376	R500	0.75	R376
4	R500	0.68	R342	R550	0.68	R376
5	R500	0.62	R310	R550	0.62	R342
6	R500	0.56	R282	R550	0.56	R310
7	R500	0.51	R257	R550	0.51	R282
8	R500	0.47	R233	R550	0.47	R257
9	R500	0.42	R212	R600	0.42	R254
10	R500	0.39	R193	R600	0.39	R231
<b>Total</b>	<b>R5,500</b>		<b>R3,572</b>	<b>R5,650</b>		<b>R3,513</b>

Determining the discount rate that is to be used in producing a DCF analysis is one of the most contentious issues in this process. In the two examples above, should a 6 per cent discount rate have been used rather than 10 per cent, the results would have been reversed.

# HOW TO CALCULATE THE VALUE OF RISK

## Example: The construction of a new hospital<sup>24</sup>

A new hospital is to be built in Gauteng by the Gauteng Department of Health, with a construction cost of R100 million, and an expected 18-month construction period.

### Identify the risks

Construction risk

### Identify and cost the impacts of construction risk and strategies for mitigating these, and estimate the likelihood of the impacts occurring

Construction risk has four material impacts:

- cost overruns
- time overruns, which may result in increased costs
- the cost of providing an alternative solution in the case of delays
- the cost of upgrades should the facility not meet the needs of the Department of Health.

As these impacts cannot be mitigated, it is necessary to assess the likelihood of their occurrence.

### Cost overruns

Based on a similar project undertaken recently, the following probabilities show that the actual construction costs in relation to those assumed in the base PSC model:

- are the same as assumed in base PSC: 15 per cent likelihood
- exceed base PSC costs by 10 per cent: 40 per cent likelihood
- exceed base PSC costs by 15 per cent: 25 per cent likelihood
- exceed base PSC costs by 25 per cent: 15 per cent likelihood
- are less than base PSC by 5 per cent: 5 per cent likelihood.

### Time overruns

The cost of delay is assumed to be R4 million per year. The institution and its transaction advisor have assumed the following for the completion of the hospital:

- completed on time: 15 per cent likelihood
- delayed by 1 year: 50 per cent likelihood
- delayed by 18 months: 25 per cent likelihood
- delayed by 2 years: 10 per cent likelihood.

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24. Adapted from *Partnerships Victoria: Public Sector Comparator Technical Note*, p.45, published by the Department of Treasury and Finance, State of Victoria, Melbourne, Australia, in June 2001.

### Cost of providing similar services during the delay period, using the existing facilities

The increased cost of using the existing facilities is assumed to be R3 million per year. The likelihood is directly linked to the likely time overruns and therefore exactly the same.

### Calculate the value of construction risk

Calculate the value of each impact. The assumptions made by the Department of Health and its transaction advisor on the cost and likelihood of the impacts can be valued as follows:

Risk valuation table				
Scenario	Effect on base PSC construction cost (R million)	Cost of risk (R million)	Likelihood of risk	Value of risk [impact x likelihood] (R million)
<b>Cost overrun</b>				
Below base PSC	95	-5	5%	-0.3
No change from base PSC	100	0	15%	0.0
Overrun: Likely	110	10	40%	4.0
Overrun: Moderate	115	15	25%	3.8
Overrun: Extreme	125	25	15%	3.8
				<b>11.3</b>
<b>Time overrun</b>				
No time overrun	100	0	15%	0.0
Overrun: Likely	104	4	50%	2.0
Overrun: Moderate	106	6	25%	1.5
Overrun: Extreme	108	8	10%	0.8
				<b>4.3</b>
<b>Provision of similar service</b>				
No delay	10	0	15%	0.0
Cost: Likely	103	3	50%	1.5
Cost: Moderate	104.5	4.5	25%	1.1
Cost: Extreme	106	6	10%	0.6
				<b>3.2</b>
<b>Upgrade costs</b>				
No upgrade	100	0	20%	0.0
Cost: Likely	105	5	40%	2.0
Cost: Moderate	107	7	30%	2.1
Cost: Extreme	110	10	10%	1.0
				<b>5.1</b>
<b>Total value of risk</b>				<b>23.9</b>

The timing of each impact needs to be assessed. The different impacts of construction risk could each have different timing implications. For illustrative purposes, all impacts are assumed to occur between years 1 and 3. In reality these impacts may be distributed later in the project term.

Timing of impacts				
Impact	Year 1	Year 2	Year 3	Basis of allocation
Cost overrun	70%	30%		Pro rata construction period
Time overrun	70%	30%		Based on delays
Similar service provision		70%	30%	Based on delays
Upgrade cost		100%		Estimate of when upgrade may be necessary

Subtotal cost of each impact in time				
Impact	Subtotal (R million)	Year 1	Year 2	Year 3
<b>Cost overrun</b>	<b>11.3</b>			
Impact		70%	30%	
Cost of impact (R million)		7.9	3.4	0.0
Cost of impact calculation		(11.3x70%)	(11.3x30%)	
<b>Time overrun</b>	<b>4.3</b>			
Impact		70%	30%	
Cost of impact (R million)		3.0	1.3	
Cost of impact calculation		(4.3x70%)	(4.3x30%)	
<b>Similar service provision</b>	<b>3.2</b>			
Impact			70%	30%
Cost of impact (R million)		0.0	2.2	1.0
Cost of impact calculation		(3.2x70%)	(3.2x30%)	
<b>Upgrade cost</b>	<b>5.1</b>			
Impact			100%	
Cost of impact (R million)			5.1	
Cost of impact calculation			(5.1x100%)	

Construct a nominal cash flow for construction risk.

Nominal cash flow for construction risk (R million)				
Cost	Year 0	Year 1	Year 2	Year 3
Cost overrun		7.90	3.40	
Time overrun		3.00	1.30	
Similar service provision			2.20	0.96
Upgrade cost			5.10	
Real cost		10.90	12.00	0.96
Nominal cost (assume inflation at 6%)		10.90	12.72	1.08
Discount rate (assume 10%)	1.00	0.91	0.83	0.75
Discounted cash flows		9.91	10.51	0.81
<b>Net present value</b>	<b>21.23</b>			

Thus, the net present value of the identified components of construction risk for the new hospital project is R21.23 million.

The process discussed above for construction risk must be repeated for all material risks identified in the project. Through this risk valuation process, the intention is to arrive at a single net present value for all risks in the project, which can be added to the base PSC to arrive at a value for a risk-adjusted PSC.

## Construct the risk matrix

Risk matrix extract						
Risk	Description	Consequence	Value of risk (R million)	Mitigation	Allocation	Risk Tracking (RFP and negotiation)
1. Construction risk	The risk that the construction of the physical assets is not completed on time, budget or to specification.	Cost and delay	21.23	Private party (PP) may pass risk to subcontractor but maintain primary liability. Institution will not pay until service commencement.	Generally allocated to PP	
1.1 Cost overruns	1.1.1 Increase in the construction costs assumed in base PSC.	Cost	9.99	PP in fixed term, fixed price contract with subcontractor.	Transfer: PP (PP may pass risk onto subcontractor but remains liable for risk.)	
1.2 Time overruns	1.2.1 Increase in the construction costs assumed in base PSC as a result of delay in the construction schedule.	Delay resulting in additional cost	3.80	Institution will not pay until service commencement.	Transfer: PP + pass on to subcontractor	
1.3 Similar service provision	1.3.1 Cost of interim solution. Results in additional cost of maintaining existing building or providing a temporary solution due to inability to deliver new facility as planned.	Cost of interim solution	2.54	Transfer: PP		
1.4 Upgrade costs	1.4.1 Increase in construction costs if the planned facility is not sufficient and additional capacity needs to be added.	Cost of upgrades	4.21	Minimise likelihood by ensuring specifications meet Institution's needs; careful planning of Institution's likely output requirements over term of contract.	Retain: Institution	

# STANDARDISED PPP RISK MATRIX

Risk matrix				
No.	Categories	Description	Mitigation	Allocation
1.	Availability risk	The possibility that the Services to be provided by the Private Party do not meet the output specifications of the Institution.	Clear output specifications. Performance monitoring. Penalty Deductions against Unitary Payments.	Private Party.
2.	Completion risks	The possibility that the completion of the Works required for a project may be (i) delayed so that the delivery of the Services cannot commence at the Scheduled Service Commencement Date, or (ii) delayed, unless greater expenditure is incurred to keep to the Scheduled Service Commencement Date, or (iii) delayed because of variations.	Special insurance (project delay insurance). Appointment of an Independent Certifier to certify the completion of the Works. Liquidated damages, construction bonds and other appropriate security from the Private Party to achieve completion, unless caused by the Institution. Relief Event.	Private Party, unless delay caused by Institution (including, Institution Variations).
3.	Cost overrun risk	The possibility that during the design and construction phase, the actual Project costs will exceed projected Project costs.	Fixed price construction contracts. Contingency provisions. Standby debt facilities/additional equity commitments; provided that these commitments are made upfront and anticipated in the base case Financial Model.	Private Party.
4.	Design risk	The possibility that the Private Party's design may not achieve the required output specifications.	Clear output specifications. Design warranty. Patent and latent defect liability Consultation with and review by Institution (but review must not lead to input specifications by Institution). Independent Expert appointment to resolve disputes on expedited basis.	Private Party.
5.	Environmental risk	The possibility of liability for losses caused by environmental damage arising (i) from construction or operating activities (see operating risk) during the Project Term, or (ii) from pre-transfer activities whether undertaken by the Institution or a third party and not attributable to the activities of the Private Party or the Subcontractors.	Thorough due diligence by the bidders of the Project Site conditions. Independent surveys of the Project Site commissioned by the Institution at its cost. Institution indemnity for latent pre-transfer environmental contamination, limited by a cap (subject to value for money ("VFM") considerations), for a specified period. Remediation works to remedy identified pre-transfer environmental contamination as a specific project deliverable. Independent monitoring of remediation works.	In relation to (i), the Private Party. In relation to (ii), the Institution, but Institution's liability to be capped (subject to VFM considerations).
6.	Exchange rate risk	The possibility that exchange rate fluctuations will impact on the envisaged costs of imported inputs required for the construction or operations phase of the Project.	Hedging instruments (e.g. swaps).	Private Party.
7.	Force Majeure risks	The possibility of the occurrence of certain unexpected events that are beyond the control of the Parties (whether natural or "man-made"), which may affect the construction or operation of the Project.	Define "Force Majeure" narrowly to exclude risks that can be insured against and that are dealt with more adequately by other mechanisms such as Relief Events. Relief Events. Termination for Force Majeure.	If risks are insurable, then they are not Force Majeure risks and are allocated to Private Party. If risks are not insurable, then risk is shared insofar as Institution may pay limited compensation on termination.

## ANNEXURE 4: STANDARDISED PPP RISK MATRIX

No.	Categories	Description	Mitigation	Allocation
8.	Inflation risk	The possibility that the actual inflation rate will exceed the projected inflation rate. This risk is more apparent during the operations phase of the Project.	Index-linked adjustment to Unitary Payments or user charges.	Institution bears risk of inflationary increases up to the limit of the agreed index. Increases in excess of this are for the Private Party.
9.	Insolvency risk	The possibility of the insolvency of the Private Party.	SPV structure to ring-fence the Project cash flows. Security over necessary Project Assets. Limitations on debt and funding commitments of the Private Party. Reporting obligations in respect of financial information and any litigation or disputes with creditors. Institution has right to terminate the PPP Agreement. Substitution of Private Party in terms of the Direct Agreement. Substitution of the Private Party with a New Private Party if there is a Liquid Market and the Retendering procedure is followed.	Private Party.
10.	Insurance risk	The possibility (i) that any risks that are insurable as at the Signature Date pursuant to the agreed Project Insurances later become Uninsurable or (ii) of substantial increases in the rates at which insurance premiums are calculated.	In the case of (i), at the option of the Institution, self-insurance by the Institution or, if the uninsurable event occurs, then termination of the PPP Agreement as if for Force Majeure with compensation to the Private Party. Reserves.	In relation to (i), if the Private Party caused the Uninsurability or, even if it did not, but the Private Party cannot show that similar businesses would stop operating without the insurance in question, then the Private Party bears the risk. Otherwise, the risk is shared between the Private Party and the Institution. In relation to (ii), the Private Party (unless caused by Institution variations).
11.	Interest rate risk	These are factors affecting the availability and cost of funds.	Hedging instruments (e.g. swaps). Fixed rate loans.	Private Party.
12.	Latent defect risk	The possibility of loss or damage arising from latent defects in the Facilities included in the Project Assets (compare, the treatment of latent pre-transfer environmental contamination, see environmental risk).	Wherever possible, the design and construction of the Facilities must be performed or procured by the Private Party. If, however, a project involves the take-over by the Private Party of existing Facilities, then the bidders must undertake a thorough due diligence of these Facilities to uncover defects. The procedure for and cost of the remediation of such discovered defects can then be pre-agreed with the Private Party. Reporting obligation on Private Party to promptly disclose discovered defects.	If the Private Party (or any of the Subcontractors) designs and constructs the Facilities, the Private Party. If not, then the Institution, but only if there is no or insufficient insurances available to mitigate this risk and if the Institution's liability is capped (subject to VFM considerations).
13.	Maintenance risk	The possibility that (i) the cost of maintaining assets in the required condition may vary from the projected maintenance costs, or (ii) maintenance is not carried out.	Clear output specifications. Penalty regime and performance monitoring. Adequate O&M contract. Substitution rights. Special insurance and special security in the form of final maintenance bonds.	Private Party.

No.	Categories	Description	Mitigation	Allocation
14.	Market, demand or volume risk	The possibility that the demand for the Services generated by a project may be less than projected (whether for example because the need for the Services ceases or decreases, or because of competitors entering into the relevant market, or because of consumer opposition to the outsourcing of the Services).	In a Unitary Payment type PPP, the Unitary Payment must be paid based on availability (not actual usage by the Institution).	In relation to a Unitary Payment funded project, the Institution. In relation to a user-charge funded project, the Private Party.
15.	Operating risk	Any factors (other than Force Majeure) impacting on the operating requirements of the Project, including projected operating expenditure and skills requirements, for example, labour disputes, employee competence, employee fraud, technology failure, environmental incidents and any failure to obtain, maintain and comply with necessary operating Consent.	Clear output specifications. Penalty regime and performance monitoring. Adequate O&M contract. Substitution rights. Special insurance.	Private Party.
16.	Planning risk	The possibility that the proposed use of the Project Site in terms of the PPP Agreement and, in particular, the construction of the Facilities on the Project Site will fail to comply with any applicable laws relating to planning, land-use or building (for example, any town-planning or land-zoning scheme) or any Consent required pursuant thereto, or that any such Consent will be delayed or cannot be obtained or, if obtained, can only be implemented at a greater cost than originally projected.	The Institution must identify at the feasibility phase any macro-level planning Consents not required for the detailed design and construction proposal for the Project, such as, any land-use and zoning Consents. These Consents must be obtained before the Project is put to tender. The Private Party must identify all planning Consents that are required for the Project having regard to its design and construction proposal. It must make adequate provision in its Works programme for such Consents to be obtained. Relief Event for delays in Private Party obtaining Consents but only if the delay is not attributable to the Private Party.	In relation to any land-use and zoning Consent, the Institution, unless Project Site selection is the Private Party's responsibility. In relation to any building Consent or other design or construction specific planning Consent, the Private Party.
17.	Political risk	The possibility of (i) Unforeseeable Conduct by the Institution or by any other government authority that materially and adversely affects the expected return on Equity, debt service or otherwise results in increased costs to the Private Party, or (ii) expropriation, nationalisation or privatisation (collectively, "expropriating actions") of the assets of the Private Party. This risk overlaps with some financial risks (e.g. tax rate change risk).	Limit risk to Unforeseeable Conduct for which there is no other relief in the PPP Agreement and to expropriating actions. Distinguish between general and discriminatory Unforeseeable Conduct. In relation to discriminatory Unforeseeable Conduct, special compensation. In relation to expropriating actions, termination and compensation.	In relation to discriminatory Unforeseeable Conduct and expropriating actions, the Institution. In relation to general Unforeseeable Conduct, the Private Party.
18.	Regulatory risk	The possibility that Consents required from other government authorities will not be obtained or, if obtained, can only be implemented at a greater cost than originally projected (compare, the treatment of planning and environmental Consents, see planning risk and environmental risk).	During the feasibility phase of the Project, a legal scan is undertaken by the Institution to identify all such Consents. Implementation by the Institution of an inter-governmental liaison process with the responsible government authorities before the procurement phase. Due Diligence by Private Party to identify the Consents required for its operating requirements. If permitted under applicable law and if this is practical, obtain all such Consents before the Signature Date.	If any such Consents (other than those relating to Private Party's operating requirements) can be obtained before the Signature Date and they are capable of transfer to the Private Party, the Institution. In relation to the Private Party's operating requirements, the Private Party.

## ANNEXURE 4: STANDARDISED PPP RISK MATRIX

No.	Categories	Description	Mitigation	Allocation
19.	Residual value risk	The risk that the Project Assets at termination or expiry of the PPP Agreement will not be in the prescribed condition for hand back to the Institution.	Obligations on Private Party to maintain and repair. Audit of Project Assets towards the end of Project Term. Security by the Private Party in favour of the Institution, e.g. final maintenance bond or deduction from Unitary Payment. Reinstatement obligations on Private Party.	Private Party.
20.	Resource or input risk	The possibility of a failure or shortage in the supply of the inputs or resources (for example, coal or other fuels) required for the operation of a project including deficiencies in the quality of available supplies.	Supply contracts for supply of total project requirements, such as take and pay contracts. Relief Events but only if failure or shortage not attributable to the Private Party.	Private Party, unless the inputs are supplied by the Institution.
21.	Subcontractor risk	The risk of subcontractor (first-tier and below) defaults or insolvency. This risk may arise at the construction and/or operations phases of the Project.	Subcontractors must have expertise, experience and contractual responsibility for their performance obligations. Replacement Subcontractors to be pre-approved by the Institution. Due diligence by the Institution must include review of first-tier Subcontracts to confirm the pass through of risks down to the first-tier Subcontractors.	Private Party.
22.	Tax rate change risk	The possibility that changes in applicable tax rates (income tax rate, VAT) or new taxes may decrease the anticipated return on equity.	If change arises from discriminatory Unforeseeable Conduct, then special compensation.	In relation to tax increases or new taxes arising from discriminatory Unforeseeable Conduct, the Institution. Otherwise, the risk is the Private Party's.
23.	Technology risk	The possibility that (i) the technology inputs for the outsourced institutional function may fail to deliver the required output specifications, or (ii) technological improvements may render these technology inputs out-of-date ("technology refresh or obsolescence risk").	Obligation on Private Party to refresh technology as required from time to time to meet the output specifications. Penalty Deductions for failure to meet output specifications.	Private Party.
24.	Utilities risk	The possibility that (i) the utilities (e.g. water, electricity or gas) required for the construction and/or operation of a project may not be available, or (ii) the project will be delayed because of delays in relation to the removal or relocation of utilities located at the Project Site.	Emergency back-up facilities, e.g. generators. Emergency supply contracts. Special insurance (project delay or other business interruption insurance). Provision by the Institution of off-site connections. In the case of (i), Relief Event for off-site interruptions in the supply of utilities (unless attributable to the Private Party). In the case of (ii), Relief Event for delays in the removal or relocation of utilities (unless attributable to the Private Party).	Private Party unless the Institution is the responsible Utility. In the case of (i), even if the Institution is not the responsible Utility, the Institution may share in this risk in circumstances where insurance is not available or unaffordable, but only if this will ensure better VFM.



