

Understanding Options for Public-Private Partnerships in Infrastructure

Sorting out the forest from the trees:
BOT, DBFO, DCMF, concession, lease...

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Abstract

This paper provides a methodology for categorizing public-private partnerships in infrastructure, based on the following key characteristics: whether the project involves new or existing business, the nature of the private sector's construction obligations, the need for the private sector to mobilize significant private funding ab initio, the nature of the private sector's service delivery obligations, and the source of the project revenue stream. The purpose

of this methodology is to facilitate mapping, referencing, cross-comparison, analytical studies, and descriptions of public-private partnerships in infrastructure projects with similar key characteristics across sector, commercial, regional, and geopolitical lines. The methodology is tested against 15 case studies representing different infrastructure sectors, regional applications, and commercial approaches to public-private partnerships.

This paper—a product of the Finance and Guarantees Unit, Finance Economics & Urban Department—is part of a larger effort in the department to develop best practice and latest technology in public private partnerships for infrastructure. Policy Research Working Papers are also posted on the Web at <http://econ.worldbank.org>. The author may be contacted at jdelmon@worldbank.org.

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Jeffrey Delmon¹

“When I use a word” Humpty Dumpty said in a rather scornful tone,
“it means just what I choose it to mean – neither more nor less.”²

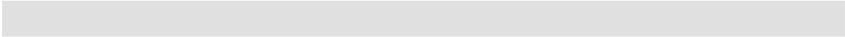
¹ The findings, interpretations, and conclusions expressed herein are those of the author and should not be attributed in any manner to the World Bank or to PPIAF, their affiliated organizations, or to the members of their Board of Executive Directors or the countries they represent. The author would like to thank Andres Londono for his assistance in writing this paper, and in particular developing the case studies. He would also like to thank Mark Moseley, Katharina Gassner, Clemencia Torres, Art Smith, Rob Lalka, Victoria Delmon, Clive Harris, Jose Luis Guasch, Alex Jett and Govindan Nair for their review and comments on different drafts of this paper. Any errors or mistakes remain those of the author.

² Carroll, Lewis, *Through the Looking Glass*, at chapter 6.

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Executive Summary

The following provides a categorization methodology for public-private partnerships³ in infrastructure (PPP), classifying the different design options for PPP based on their most salient elements, those characteristics fundamental to the nature of PPP and therefore the character of the project in question. Lack of an agreed categorization methodology has created confusion and limited the ability to cross-fertilize, learning lessons from different regions and sectors who use different terminology, making it difficult to know, without in-depth analysis, if the structures being used are similar or not.

There is no universal norm as to the most appropriate approach to PPP. That analysis needs to be made on a country-by-country, sector-by-sector and project-by-project basis. The model is therefore not meant to be normative, i.e. it does not identify which PPP option would be the most appropriate, most efficient or most effective nor does it try to be comprehensive (nor uncontroversial). Instead, it serves three key purposes. It:

- facilitates the task of practitioners when seeking to identify relevant lessons learned from other projects, sectors, countries, legal systems and cultures;
- helps mapping, referencing and analytical studies by providing a practical, descriptive nomenclature; and
- assists in the description of a given PPP structure, e.g. for policy or decision makers without the confusion of political, nationalistic or cultural labels often associated with other terminology.

For example, when technical experts need to discuss PPP options with policymakers, using this classification model will facilitate the process by avoiding misunderstandings associated with tired or misused vocabulary. Equally, when designing PPP structures to fit the needs of a given country, sector or project, the design team will want to take advantage of the lessons learned from similar exercises. The model will help the application of lessons learned from other similar structures across the globe by identifying commonalities amongst those structures

³ This paper uses a broad definition of PPP to be relevant across the largest sample of projects.

and enabling the design team to utilize good practice associated with the relevant elements of those structures.

The classification model addresses five key parameters that may or may not be relevant to any given PPP project. These parameters identify the most fundamental characteristics of a PPP project.

1. New or existing business – taking over existing revenues, customers, assets or employees represents a different risk profile than a new business.
2. The nature of project company construction obligations – implementing a significant construction program carries with it a host of construction and performance related risks that will be essential to understanding the role of the project company.⁴ This obligation differs fundamentally if it is a new build, or the refurbishment of existing assets.
3. The need for the project company to mobilize significant private funding ab initio - where the project company is required to mobilize private finance for any significant up-front costs (including fees, acquisition of assets and construction costs), the risk profile for the project company and the influence of the financiers will alter fundamentally the nature of the project.
4. The nature of the project company’s service delivery obligations – refers to the extent to which the project company is delivering services directly to consumers “*User*” or only to a single user, such as the utility “*Bulk*”. Delivery of services to a large number of consumers represents a more complex context for the project company, and its financiers.
5. The source of the project revenue stream – the source of the revenue stream influences the certainty, size and nature of that revenue stream, e.g. the collection risk associated with the revenue stream and the likelihood that the obligor will be available to pay on its obligations. “*Fee*” refers to a single or small number of purchasers of the offtake or

⁴ For ease of reference, this paper refers to the “grantor” as the public initiator of the project and the “project company” being the private company undertaking the project.

service, while “*Tariffs*” refers to collection of revenues from a large number of consumers or users.

The Classification Model

Business	Construction Obligations	Private Funding	Service Delivery	Source of Revenues
New	Build	Finance	Bulk	Fee
Existing	Refurbish		User	Tariffs

For example, a project where the project company builds a new power plant, operates it and sells the power to the local utilities, would be a *New-Build-Finance-Bulk-Fee*. The refurbishment of an existing hospital, financed by the project company, where the project company does not provide clinical services, but instead makes the refurbished hospital available to the local health authority for a fee and the grantor delivers clinical services out of the hospital. This project would be a *New-Refurbish-Finance-Bulk-Fee*. The management of an existing water company and refurbishment of assets, financed by the grantor, with revenues collected from the consumers, would be an *Existing-Refurbish-User-Tariffs*. The management of an existing waste management plant for the local utility with no capital expenditure, but an up-front concession fee, with revenues from anyone wanting to deposit waste at the facility, would be an *Existing-Finance-Bulk-Tariffs*.

1. Introduction

The public sector provides financing for the vast majority of infrastructure services. The government analyzes, chooses, and implements policies intended to improve infrastructure delivery, increase access to financing, reduce waste and corruption, and develop the information and data to manage infrastructure effectively and efficiently. Public-private partnerships in infrastructure (PPP) are one of the tools in a policymaker's arsenal.⁵ PPP, in this paper, means any contractual or legal relationship between public and private entities aimed at improving and/or expanding infrastructure services.

The decision to adopt PPP must be political, first. The government must consider the political and social implications of PPP and whether there is sufficient political will to implement PPP. Next, consideration needs to be given to the institutional, legal and regulatory context - the extent to which government institutions have the needed skills and resources, the financial and commercial markets have needed capacity and appetite, and laws and regulations encourage or enable PPP - and whether changes need to be made to the institutional, legal and regulatory climate in order to provide the right context for PPP. Once these basic issues have been addressed, those designing the PPP solutions available to policymakers must consider the most commercially and financially viable and appropriate structures. This must involve consideration of cost benefit, value for money, the sources of finance, the commercial arrangements, the nature of investors and government participants, and a variety of other circumstances that need to be addressed in the design of appropriate PPP structures. This latter process is where a robust classification model can help.

For too long the methods available for structuring the involvement of the private sector in the provision of infrastructure services has been constrained by the confusing lack of a common terminology. We use terms such as privatization, divestiture, concession, lease, affermage, BOT, BOOT, ROT, BOO, ROO, DBO, RBO, DCMF, BTL, RTL, BTO, RTO, DBFO, PFI, outsourcing, delegation of services, management contract, operation and maintenance contract, service contract, operating contract, performance contract and the list goes on. Yet there is

⁵ This paper will not describe PPP projects in detail. For further discussion of PPP and the nature of the project structures often encountered in such projects, see Delmon, Private Sector Investment in Infrastructure: Project Finance, PPP Projects and Risk (2009).

no clear agreement on what these terms mean. Each term can be used for a number of different structures. These different terms become even more confusing across national and regional divides, and as between different sectors.

Box 1: The Mighty Concession

The term “concession” is used globally for a number of different purposes. At its most basic, the term means the grant by a government of a right to provide a service or to use an asset, for example the grant of the right to exploit natural resources located on or under a particular plot of land. It is also used to refer to different PPP structures. In Russia, a “concession” is a federal government structure whereby the project company builds a facility, transfers it to the grantor and operates it over a long period. In France, also defined by law, it means giving a private entity the right to use government owned assets for their maintenance, operation and management over a period. The French model does not usually involve a significant investment obligation of the concessionaire. In Brazil, a managed concession is one where the concessionaire runs public assets and earns its revenues from tariffs charged to consumers, while a sponsored concession includes a payment by the grantor to top up the revenue stream. In Chile the concession is used for refurbishing and building toll roads and for the privatization of the water sector. The water concessions in Manila involved the transfer of existing assets to the project company, as well as a large amount of existing debt, with the project company responsible for operation, maintenance and expansion of the system and delivery of services to consumers. And, of course, in the extractive industries (e.g. oil, gas and mining) it means having the right of extraction in a given area, usually against a royalty paid to the government. The word "concession" is the most common and probably the least precise of the PPP terminology.

The lack of clear terminology has limited the development of PPP, and has made the study of PPP more complicated. It makes comparing structures (in particular in different countries and sectors) more difficult, as similar structures often use different terminology, while dissimilar projects may use similar terminology. By creating a common terminology, more work can be done adopting the lessons

learned from one sector or region to projects of a similar design in another sector or region. It will also simplify dialogue between policymakers and practitioners, allowing them to express ideas and complex structures in simple, common terminology.

This paper proposes a methodology for classifying the different design options for PPP based on their most salient elements, those characteristics fundamental to the nature of PPP and therefore the character of the project in question. It also discusses in further detail why some of these characteristics are so important, and why other characteristics commonly thought to be essential to PPP have not been used.

Box 2

For ease of reference:

- The entity that undertakes the delivery of infrastructure services can take a number of forms and goes by different names, such as project company, concessionaire, déléguée, asset holding company, utility, or operator. This paper will use the term “project company”.
- The entity that lets, creates or grants the project may be a local utility, a state owned enterprise (SOE), a government department, a private asset owner or some other form of interested party. In this paper, it will be called the “grantor” without limiting its scope to a public or private grantor.
- Of the generic terms for private sector involvement in infrastructure, this note will use the one that carries the least political and psychological baggage, the least contentious and the most generic: PPP.

The paper is organized as follows: this section 1 introduces the need for categorization and describes the model. Sections 2-6 provide a more detailed discussion of each of the key elements of the model:

- New or existing business (section 2)
- Construction obligations (section 3)

- Private financing (section 4)
- Service delivery (section 5)
- Source of revenues (section 6).

A seventh section shows how the model would be applied to a series of case studies.

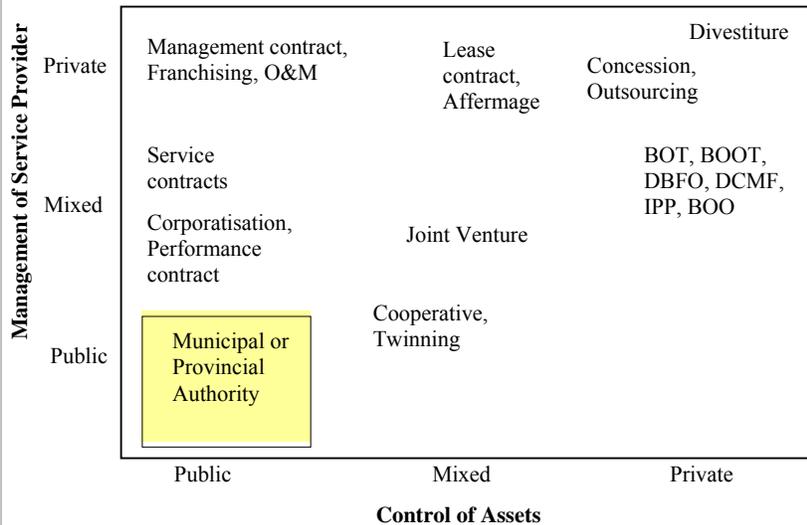
1.1 CONSTRAINTS OF CURRENT MODELS

The lack of understanding amongst those implementing PPP and those external to the PPP process endeavoring to assess whether PPP is a good thing is exacerbated by the use of terms of art that are at best inexact. Even the French terms like “concession” and “affermage” defined over the centuries by French administrative law have lost their strict meaning outside of France.

Generic terms for private sector involvement in the provision of infrastructure services, such as PFI, private concession, privatization and PSP can have complicated and unhelpful connotations. “PFI” tends to mean a specific UK model, “private concession” is confused with the English, French and a variety of Latin American models of concessions. Significant PPP projects have been delayed by debates over whether a “concession” or a “lease” or a “management contract” should be used. These debates often become matters of institutional philosophy or pride, yet their meaning is rarely unpacked and is often misunderstood. Often both sides of the debate intend the same result, but use different labels. The misuse of the term "privatization" and the difficulty in analyzing its relative advantages and disadvantages suffers from many of the same challenges.

A number of efforts have been made to order PPP. For example, in different books and articles this author used a field, with points plotted on it trying to indicate how different PPP structures might fit in the context of responsibility for service provision and control of assets. While the implication was that PPP is ultimately flexible, evidenced by the use of a field, the implication is still that the relevant terminology actually means something specific. (See Box 3).

Box 3: Variety of Available PPP Arrangements



The terms in the diagram above are some of those frequently used in PPP:

- Management or operation and maintenance (O&M) contract – where a private entity provides some operation and maintenance services for a fee, usually based on delivering satisfactory services.
- Affermage – where a private entity builds and/or refurbishes and operates a service usually delivered directly to consumers, and the grantor finances any major capital expenditure. The private entity generally collects tariffs directly from consumers.
- Build-Operate-Transfer (BOT), Build-Own-Operate (BOO), Build-Own-Operate-Transfer (BOOT), Design-Build-Finance-Operate (DBFO), Design-Construct-Manage-Finance (DCMF) – where a private entity finances and builds/refurbishes a facility that provides services to a single or small group of large offtakers (often a public utility) or directly to consumers (e.g. toll roads).
- Lease – where existing assets and/or land is leased to a private entity for construction of assets to provide services to offtakers or directly to consumers.
- Concession - where a private entity finances and builds and operates a service usually delivered directly to consumers. Divestiture is where the assets are sold to a private entity, who provides services directly to consumers.

Another popular approach is to plot the forms of PPP against a continuum (see Figure 1) - this model is used for the World Bank's PPP Resource Center Website⁶, the UNCITRAL model law⁷, PPIAF PPP toolkits⁸ and others. Similar to the field discussed above, the continuum endeavors to show the flexibility of PPP, and the lack of clear delineation between different forms of PPP, by demonstrating the movement of PPP structures across the continuum. However, it clearly provides only very rough classification against the general concepts of private sector risk and control. It also implies that the sub-parts of the continuum are subject to clear and exact definition.

Each of the existing structures endeavors to capture the flexibility of PPP while providing the order and structure, despite the lack of clarity. While good pedagogical tools, these tables are not useful for analytical purposes, and would not achieve the aims set out above.

The creation of a practical, descriptive terminology will help

- i) Reinvest PPP with the innovative and creative capacity that it is meant to embody
- ii) Facilitate analysis and comparison across sectors and regions, permitting lessons learned to cross these often confusing barriers
- iii) Decouple terms of art from specific examples whose specificity may influence assessment of other similarly named but fundamentally different structures.

This paper proposes a categorization model, i) a snap shot of the most important characteristics of a PPP project, while ii) maintaining the simplicity necessary for it to function effectively. These twin functions necessitate including only the absolutely critical characteristics of PPP in the model.

⁶ www.worldbank.org/inflaw

⁷ www.uncitral.org

⁸ www.ppiaf.org

Figure 1



1.2 PURPOSE OF THE CLASSIFICATION MODEL

There is no universal norm for the most appropriate approach to PPP. While a variety of successful projects can be used to demonstrate elements of PPP that may potentially add value, it is not possible to say that one structure or model is necessarily more universally appropriate than another. While much time has been spent debating the relative merits of different models, particularly those developed by national bodies or historically through specific legal systems, at the end of the day nationalism should bend to commercial and political practicality when designing an appropriate PPP structure. In fact, rather than identifying one specific approach to emulate, designers of PPP projects need to consider advantages offered by numerous projects and approaches. The analysis of what is needed for a particular project or program needs to be made on a country-by-country, sector-by-sector and project-by-project basis.

The model is therefore not meant to be normative, i.e. it does not identify which PPP option would be the most appropriate, most efficient or most effective in any given situation. It does not specify what should be, its task is to report on the nature of a given PPP structure and its key characteristics. The model serves two key purposes. It:

- Facilitates the task of practitioners when seeking to identify relevant lessons learned from other projects, sectors, countries, legal systems and cultures
- Enables the description of a given PPP structure without the confusion associated with political, nationalistic or cultural labels applied to such structures.

For example, when technical experts need to discuss PPP options with policymakers, using this classification model will facilitate the process by avoiding misunderstandings associated with tired or misused vocabulary. Policymakers need a mechanism to compare solutions easily and clearly. The current complexity and confusion of terminology does not help. The classification model allows policymakers to break projects down into their key constituent elements and to compare and contrast such models. It is also a pedagogical tool. By breaking projects down into their key characteristics, it will be easier to explain the importance of these characteristics and how they influence the nature of the project.

Equally, when designing PPP structures to fit the needs of a given country, sector or project, the design team will want to take advantage of the lessons learned from similar exercises and experiences. The model will help the applications of lessons learned from other similar structures across the globe by identifying commonalities amongst those structures and enabling the design team to utilize global good practice.

This exercise, of course, comes with a serious caveat. Delivering infrastructure services is hard to get right, whether they are delivered by the public sector or through PPP. Even where the classification model shows commonalities between structures used in different places in different contexts, the design team needs to be very clear that the context of those projects can have a significant influence on the efficiency of a given PPP structure. It is never enough to simply copy things that have been done successfully in other places; a well-designed PPP project is specifically contextual.

1.3 NATURE OF CLASSIFICATION MODEL

A new classification model will need to focus on the most important issues in PPP projects: existing business risks, construction obligations, the need to arrange private financing, to whom the services are delivered and source of the project revenue stream; while avoiding the sometimes popular, but less important, issues. By focusing on these key issues, the classification model permits a comparison of projects across regions and sectors by identifying their key characteristics and classifying them accordingly. It allows the communication of these key issues in a coordinated manner, facilitating analysis, and comparing and contrasting different PPP models. The name given to a project thereby communicates a wealth of key information. This represents a significant change from the current terminology which, by using a limited number of terms interchangeably, creates confusion.

The classification model (Figure 2) has been kept as simple as possible to facilitate its use. While not exhaustive, it identifies the key PPP issues, providing a platform for more in-depth analysis and in particular comparison of similar structures in different sectors or regions where terminology might otherwise hinder such assessment.

Figure 2: The Classification Model

Business	Construction Obligations	Private Funding	Service Delivery	Source of Revenues
New	Build	Finance	Bulk	Fee
Existing	Refurbish		User	Tariffs

The classification model addresses five key parameters that may or may not be relevant to any given PPP project. These parameters identify the most fundamental characteristics of a PPP project. These issues are discussed in more detail in sections 2-6 below.

New or existing business

Where PPP involves the project company taking over an existing business (“*Existing*”), a number of additional risks arise (e.g. existing liabilities) as well as a number of benefits (e.g. existing revenue stream). Existing business means employees, contracts, undertakings, commitments and other issues requiring due diligence by prospective investors, and more complexity in the preparations required from the Government. A new business (“*New*”) will be easier for project finance lenders to ring-fence with security rights and other control mechanisms. But an existing business, while hard to ring fence, offers an existing revenue stream, tested cost data, historical demand data and other useful evidence of

viability and sustainability, which might allow lenders to treat the project as a hybrid acquisition financing and project financing.

Construction commitments

This part of the classification model asks whether the project company's obligations include significant new capital investment and/or refurbishment of existing assets in the early stages of the project, in particular where consideration of such construction obligations form a key aspect of a potential investor's assessment of the project. A new build obligation ("*Build*") will differ significantly in complexity and risk profile from construction involving existing facilities ("*Refurbish*"). The responsibility for procurement and management of major construction, in particular in the early phases of the project where the project revenue stream depends on the timely and successful completion of such capital expenditure, is a key driver of the risk profile for an infrastructure project. These construction obligations create a different risk profile for the project company, including managing construction contractors, increased cost risk and coordinating funding for such investment. The revenue profile of the project will often change significantly after completion of construction, making completion risk key to the financial viability of the project.

Source of private financing

The project company may be required to provide significant financing at the outset of the project ("*Finance*"), for example for investment in assets, refinancing existing debt or paying a purchase price. Requiring the project company to have significant financial exposure to the project can help reinforce the project company's incentives, if properly structured, but will certainly alter the risk allocation of the project as lenders and equity investors impose their requirements on the project company. *Finance* obligations tend to extend the time for procurement in order to allow more robust risk assessment and allocation and for lenders to perform due diligence.

Service delivery

Where the project company delivers its services directly to consumers ("*User*"), its relationship with those consumers can raise specific complexities associated with the diversity of that customer base, the differing demands made by customers, the involvement of regulatory agencies designed to protect consumers, public and natural resources. On the other hand, the project company may be required to deliver services in bulk to a single utility ("*Bulk*"), in which case the interfaces between the project company and its client are easier to define and manage. The nature of the service delivery obligation is associated with specific risks, for example customer service functions, regulatory interfaces, financial management and accounting.

Source of revenue stream

The source of the revenue stream (from consumers or from a limited number of large offtakers) influences the certainty, size and nature of that revenue stream, e.g. the risk of collecting revenues from users and the likelihood that the obligor will be available to pay on its obligations. "*Fee*" refers to a single or small number of purchasers of the offtake or service, while "*Tariffs*" refers to collection of revenues from a large number of consumers or users. The source of revenues will therefore specifically alter the mechanisms that the project company will need to implement to manage that risk, for example billing functions and collection methodologies. He will also have a critical influence on the credit enhancement and security rights that investors and financiers may require, for example where collection risk for the privatization of the obligor of the revenues is insufficient, the need for a score arrangements for the credit enhancement may arise.

The service delivery and revenue source columns could in theory be combined. They both relate to the relationship between the project company and individual consumers. However, often the financial and service delivery relationships are different, for example a home-based road (*User-Tariff*) and unavailability fee-based road (the *User-Fee*), these are very different structures that can be clearly differentiated by using separate columns for service delivery and revenue.

1.4 USING THE CLASSIFICATION MODEL

A few precisions should be made on the application of the model:

- A project need not include each parameter; in fact many projects do not include each of the parameters indicated.
- If a project satisfies more than one row in a given column, reference is made to the bottom row. Therefore a toll road project involving both Build and *Refurbish* would be referred to as a *Refurbish* project. This is because the bottom row represents the greater amount of risk allocated to the project company, and therefore reflects better the key issues associated with that parameter.
- There is a clear level of subjectivity to the application of this model, and therefore its results should be considered accordingly. For example, where the project company bears an obligation to finance the project, but the amount of financing required (beyond that available from project revenues) is not relatively significant, the model should not reference “*Finance*”. This will entail a subjective assessment as to the relative significance of the amount of financing required from the project company.

1.5 ISSUES EXCLUDED FROM THE MODEL

The following are some of the issues that were intentionally excluded from the model, for the reasons set out below. Many of these excluded issues will be controversial. Some of these issues are relevant, but not sufficiently critical to merit inclusion in the model. In other cases, a proper treatment of the issue would require a level of complexity in the model that would defeat the central goal of simplicity.

Hand-over

At the end of the project period, the project assets and business need to be handed to the grantor or to another project company (maybe even the same project company). The nature of hand-over, while it may be complex in design and implementation, is more important in its significance in the treatment of public assets and public perception of the nature of the project, in particular whether the project will be considered a quasi-privatization (which may raise public resistance) and does it satisfy public accounting rules (e.g. where return to the public sector might result in the project debt being counted as Government debt). However, the actual impact of reversion on the risk profile of the project and the relevance of the

project to the government are limited. Every PPP project involves handover of some sort, whether to the government or to another private company, unless the project involves full the vesture by the government, or where the assets have reached the end of their lifecycle. But even then, most projects will contemplate some reversion right of the government, even if it is just in the event of project company default. Any additional information provided by including hand-over in the classification model would be outweighed by the added complexity of the model and was therefore rejected.

Who owns the assets?

Transfer of asset ownership to the project company may be done for a number of reasons, for example to

- i) Keep debt off balance sheet, where government ownership of assets might result in project debt associated with the assets being treated as government debt
- ii) Allow the project company to account for depreciation and other tax benefits to the extent these are reserved for owners of the underlying property
- iii) Provide the project company with regulatory/legal rights (e.g. for simplified access to third party land, disconnection of services or legal “standing” to challenge regulatory decisions) to the extent these attach only to the asset owner
- iv) Give investors and lenders security of legal title

However, the implications of asset ownership are relatively limited, and in fact are only slightly different than other rights that might be created over the assets (like leases and licenses). The regulatory and accounting issues discussed above aside, the key concern associated with asset ownership is the enforcement of government reversion rights or whatever transfer arrangements there may be at the end of the project period. Where the project company owns the assets, enforcing such transfer obligations may be more difficult unless specifically supported by law or the legal system. However, most legal systems allow governments to seize assets used for public services, including roads, water, power and similar facilities. And every jurisdiction allows the government to seize private assets for reasons of

public or national interest. In some cases, the government will have a legal right to seize assets associated with important public services, in urgent cases, for example the UK government seized the assets of Railtrack under a similar legal right.⁹

Therefore, asset ownership is an illusory comfort. Lenders will often proclaim the importance of asset ownership and security for their loans, but such rights are rarely more effective than other security rights. Lenders will generally not be able to remove assets to dispose of them or sell the whole project, therefore such security rights are more often defensive in nature - to protect against those who would want to seize project assets or stop project operations. Therefore, so long as other creditors are junior to the lenders, and they have stepping rights to ensure that they can maintain project operations, asset ownership is not needed. And, in practice, most projects do not benefit from asset ownership.

Scope of work

The exact nature of the services to be provided by the project company differentiates projects and provides specific understanding of the commercial and technical risks likely to be encountered by the project company. For example, two different PPP projects may allocate to the project company the task of managing power distribution in a given area. However, one PPP allocates all management functions while the other relates only to billing and collection. It would be possible to devise a model that would differentiate even the most subtle differences in scope of work; however, such a model would be too complex to be useful. For this reason, the detail of the scope of work demanded of the project company is not included in this model.

⁹ <http://en.wikipedia.org/wiki/Railtrack>.

Design risk

PPP projects will allocate very different levels of design risk to the project company, whether the project company provides the preliminary design, the detailed design and/or the working drawings, in particular the extent to which the project company warrants the design, the site data and concept that underlies the design. The project company may also take the risk of obtaining approvals for the design and its different elements. While design risk is an important measure for an investor considering a PPP project, it is not as useful when comparing projects across sectors and regions, would complicate the model significantly given the many different variations of design risk that may be taken by the project company.

Ongoing asset renewal/maintenance

The model addresses investment in new assets or significant, predefined refurbishment of existing assets in the early stages of the project, but it does not address on-going asset maintenance or replacement. This is typically a project company risk where the project company provides asset management functions. While this risk is an important aspect of a PPP project, it was considered so common that it was not included as a separate category to avoid diluting its relevance. Providing a separate category for this function was considered insufficiently critical when balanced against its complexity and the underlying pursuit of simplicity.

Access to grants/subsidies

The grantor or some government entity may provide funding such as subsidies, financing, and/or investment. While government money is clearly an important part of any project, this model focuses instead on the risks and obligations placed on the project company, with the clear implication that all other risks and obligations will be borne by the grantor. For this reason, the model focuses on private financing mobilized by the project company.

2. Business

The project company will take responsibility for an existing business (“*Existing*”) or a new, greenfield function (“*New*”). A project involving the creation of a new

water treatment facility to provide bulk water to the water utility would be a *New* project, while the extension and operation of an existing airport would be an *Existing* project.

Projects which involve an existing business can be more complex to implement, requiring assessment of risks associated with, for example, existing assets, employees and business liabilities. Each of these issues will necessitate a more extensive due diligence process than would a *New* project. However, an *Existing* business can also bring with it a better understanding of demand, an existing portfolio of assets and business, more certainty as to project data (since it will have been tested) and an existing revenue stream; all of which can make for a significant benefit for investors and the financial viability of the project.

2.1 NEW

In the case of a *New* project, the investors need not perform significant due diligence on what went before. Risks, in particular liabilities, can be considered on a prospective basis, ring fencing the investors, and in particular the lenders. It is also easier to replicate *New* project structures in different places, for example the successful IPP and toll road programs that have been developed in Chile and other countries. The key benefits of a *New* PPP include:

- *Defined capex* - the single purpose nature of a *New* PPP project allows the investors and lenders alike to identify with some accuracy the total debt and equity requirements of the project. The design of solutions can start from the more or less blank page, without the complication and uncertainty of the series of interactions and relationships typical of existing commercial functions. Though there may be *some* slippage in construction cost, the capital expenditure required for the project is defined in advance, and therefore allows greater certainty and foreseeability.
- *Ring-fenced operation* – since they involve a new legal entity and a new commercial undertaking, *New* projects provide a more straightforward opportunity for project assessment, due diligence, security rights, risk assessment, forecast of financial viability, isolation of the revenue stream. Investors and lenders need not be concerned with historical liabilities, rights created in third parties, defects caused by third parties, etc.

- *Isolated services* - utilities are often loathe (or may find it unwieldy) to outsource management or decision-making processes, but are more comfortable isolating specific tasks for private sector involvement. Since New PPP usually involves identified structures or services, this may fit more easily into the context of utility management.

2.2 EXISTING

Existing projects involve a project company taking over an existing task or function and possibly refurbishing or expanding them. It may relate to a whole task or whole business structure, outsourcing to the private sector the delivery of services needed to perform that task or manage the business.

Existing projects can involve the following:

- Reallocation of management functions
- Outsourcing and repackaging of services
- Reform of recruitment policy and incentive structures
- Improving customer relations
- Reforming corporate objectives.

The projects therefore have the ability to improve corporate and management capacity. This also allows the government to isolate cost centers within the corporate and management structures, thereby

- Identifying inefficiencies
- Allowing the measurement of outputs per unit of subsidy provided
- Enabling the government to reform the way it gives subsidies and incentives to management in the context of infrastructure service delivery.

The clear benefit of PPP in *Existing* projects is to encourage reform of infrastructure service delivery at the most fundamental levels. Infrastructure service delivery is primarily in need of improved management (financial, technical

and labor),¹⁰ this implies greater use of *Existing* projects. Some of the most common services allocated through *Existing* projects include:

- Management of distribution systems/assets - using performance-based incentive mechanisms to achieve greater efficiency in the management and replacement of assets, responding to end-user complaints, requests for new connections and other asset related services.
- Exploitation of commercial opportunities – certain assets, like airports and toll roads, present opportunities for affiliated commercial undertakings, e.g. using available land, excess asset capacity, or selling additional goods and services to end-users. This is of particular interest in airports and ports where a number of commercial services can be sold using the property available for the project.
- Billing and collection - public service providers are often inefficient when collecting tariffs from end-users due to a lack of incentives created for the public utility to improve its revenue stream and the potential political ramifications. By outsourcing billing and collection, collection risk can be allocated to the private sector as can enforcement penalties, disconnection, etc. The incentive mechanisms for such arrangements need to be developed carefully to avoid overly vigorous application of police powers and the health and safety ramifications of overly aggressive collection methods leading to unnecessary disconnections or excessive (and possibly unhealthy) usage reduction.
- Reduction of operating costs – the project company, in its pursuit of profitability, is generally more experienced at maximizing efficiency than are public utilities. By providing the project company with properly balanced incentives, the grantor can benefit from greater efficiency.
- Customer service - private sector commercial entities are often more focused on customer service, in order to improve profitability and attract a greater customer base. By outsourcing such customer services, public utilities can benefit from the greater experience of the private sector.

¹⁰ Gassner, Popov and Pushak, “Does the Private Sector Deliver on its Promises? Evidence from a global study in water and electricity distribution”, (World Bank, December 2007). www.ppiafdev.org.

This *Existing* model raises a number of complications not encountered in *New* projects, for example

- Social risk - Existing projects involve a more extensive interface between the private sector and the general public. Since infrastructure services are often historically provided by public entities, the difference in approach to service delivery and customer relations between private and public sector entity may result in considerable backlash from consumers.¹¹
- Existing activities - Consideration may need to be given to the transfer of public sector employees, existing liabilities, unidentified liabilities and contractual or other obligations which may constrain the project company's activities in the future. Existing projects are vulnerable to the implications of current and past activities.
- Existing assets - Existing assets may not be identified and categorized in advance. Further, the condition of those assets and need for replacement or refurbishment may not be clear until well into the project. The potential for any defects or shortcomings in these assets creates a significant risk for all parties.
- Future expansion - Rather than being bound to a strict scope of works to be built or improvements to be made, the project company may be bound to more general obligations to improve the quality of services delivered, e.g. the level of losses from the distribution system or the quality of services rendered to consumers. The need for capital expenditure may not be clear at commencement of the project. This may necessitate the project company agreeing with the grantor on rolling programs for capital investment based on the amount of income obtained by the project company or as required to satisfy the performance criteria placed on the project company.
- Customer services – The project company will need to comply with public and social obligations associated with the delivery of infrastructure services. Where the regulator is technically competent and genuinely

¹¹ Delmon, "Implementing Social Policy into Contracts for the Provision of Utility Services", in Dani, Kessler and Sclar eds., *Making Connections: Putting Social Policy at the Heart of Infrastructure Development* (2007).

independent from the political establishment, the regulator may provide a practical buffer for the project company against interference from government bodies. In the absence of an adequate regulatory framework, a specific regime will need to be included in the project agreements, and may be reinforced by government shareholding in the project company.

3. Construction obligation

The second key characteristic of a PPP project is the allocation of a major construction obligation, focused on either *Build* (obligation to construct capital assets – also known as a greenfield project) or *Refurbish* (a significant obligation to refurbish or expand existing assets – also known as a brownfield project). So a greenfield power plant would be a *Build* PPP while the refurbishment of an existing hospital would be a *Refurbish* PPP.

These construction obligations are limited to significant undertakings occurring early in the project, such that prospective investors will plan and possibly prepare preliminary designs for such works in advance and will consider carefully such works as a part of project assessment. Such construction obligations would therefore have a more considerable impact on the risk allocation set out in project agreements and risk perceptions of potential investors. The more a capital expenditure obligation is delayed in time after commencement of project, the more uncertain will be the nature of that obligation, and the less specific will be its implications to an investor evaluating the potential of a project. Where the obligation does not arise until some time after commencement, it may not be feasible to enter into a fixed price / fixed time construction contract. The model therefore highlights the difference in risk profile of projects that involve a significant construction obligation in the early part of the project.

The financing for the project will assume a date for completion of the works. Any failure to complete the works by this date will have a direct impact on the sufficiency of revenues to repay debt and accumulate return on equity. Given the generally fixed duration of a PPP project, every day of delay reduces total revenues for the project. Similarly any increase in cost of the works will have a direct impact on the extent to which revenues are sufficient to satisfy debt repayment and to earn a profit for the equity holders. Therefore a project company undertaking a significant capital expenditure obligation will be subject to market risk

implications, such as the market cost of labor, materials, and technology. Underperforming works reduce revenues (which are generally output based) and therefore undermine financial viability of the project.

But undertaking major construction works also represents a significant commercial opportunity from the construction and associated contracts. The profit margins on turnkey, also known as engineer -- procure -- construct (EPC), contracts are usually significantly higher than the profit margin items earned by contractors on traditional construction contracts. Bidding consortia for a project involving a significant construction obligation are often led by construction contractors interested primarily in winning the construction contract. This raises conflict of interest and control issues for the grantor, shareholders and the lenders.

3.1 CONSTRUCTION RISK

The construction phase involves potentially the most costly project risk. The nature of PPP projects is such that an incomplete project will be of limited value. Therefore, both the grantor and the lenders will have a significant interest in ensuring that the works are completed in accordance with the project specifications. Construction risk includes:

- The adequacy of the design of the works
- The nature of the technology to be used and the risk of defects in equipment or materials
- Unforeseen events or conditions, such as extreme weather or unforeseen subsurface conditions
- Environmental risks arising during construction
- The availability of labor and materials, whether skilled labor can be procured locally, to what extent both labor and materials will need to be imported, visas and licenses for such importation and restrictions imposed by local labor laws (including working hours and holiday entitlement)
- The availability of experienced management, committed to the project

- The availability of associated infrastructure and services, such as access roads, the provision of services to the site (including water, electricity and other utilities) and transportation to the site for labor and materials
- The program for completion, whether the time for completion is realistic in view of the labor and materials required for the project, the technology in question, the limitations of the host country infrastructure, climate and market, design requirements, and testing and commissioning
- The cost of completion, changes in the market for labor and materials, services necessary for construction, financing costs, administrative costs and other costs subject to change over the period of the construction contract
- Political and natural force majeure.

The project company may want to impose a fitness for purpose standard on the construction contractor. A fitness for purpose obligation will help maintain the fixed price, by placing on the construction contractor the obligation to ensure the design is sufficient for the purpose intended for the project, and therefore decrease the need for variations in the scope of works.

The construction contractor will be responsible for designing and building a project capable of performing in accordance with the specified standards. After the construction contractor has finished construction of the project, it must satisfy certain tests and inspections in order to demonstrate compliance with the project specifications, successful connections with any external network (such as a power grid or a water system), and proper management of interfaces between different equipment and technologies used in the project. This commissioning process will often involve a performance component to ensure that minimum levels of performance are achieved before taking over by the project company.

The time for completion will be of great importance for the project company and the grantor. The project company will want to commence operation of the project as soon as possible in order to earn maximum revenue and improve return on investment. The grantor will have put the project out to tender owing to a pressing need for the service to be rendered and will therefore want the construction completed in the least possible time. The government may have given political

undertakings to complete the project within a specific time frame or before the next election.

Cost increase risk will also arise as between financial close and from time to time throughout project implementation. This risk is also generally shared between the grantor and the project company, but with the grantor taking a markedly smaller portion of this risk. Certain of the elements of post-financial close cost increase risk are discussed below. Change in law and other similar events which can increase the project cost will be discussed later.

Given the time frames involved in PPP projects and the construction period, costs specific to construction, such as the cost of labour and materials, are likely to change. The project company and the lenders will want the construction contract to be let for a fixed price with extremely limited opportunities for the construction contractor to increase the contract price.

3.2 BUILD

A greenfield project, where new assets are built, a *Build* classification, implies significant project company risk, associated with design risk, permitting, construction cost and time for completion. The project company will need to invest significant efforts into a *Build* facility, often with little information on site conditions, how the chosen technology will work on the site and how different construction methodologies will work given the context of the site. *Build* projects will therefore raise a number of specific issues:

- Site conditions risk – A Build obligation often involves a greenfield site, one where complex works or structures have not existed before. The site would therefore involve little if any risk of existing structures, but equally there may be limited information on the nature of the site, in particular subsurface and hydrological conditions. What information there is may not be proven and may therefore involve the risk of inaccuracy or incompleteness. This raises specific concerns for project companies and potential investors, who may need to perform surveys and studies in advance of making an investment decision to assess this risk.
- Design flexibility – A Build scenario often involves a high degree of flexibility for the project company to adopt the technology most appropriate to the services to be performed, with the opportunity for

private sector innovation and efficiencies. The challenge is encouraging such innovation while maintaining on the project company the risk of performance of the works.

- Certainty of time and cost – a greenfield project, with limited interface with other works, flexibility in design and a well defined scope of works, as is often the case for Build projects, makes it easier for the project company to enter into a fixed price and time construction contract (also known as an engineer-procure-construct (EPC) or turnkey contract). This will then facilitate the grantor placing more strict obligations on the grantor to deliver the works to a fixed price and by a fixed date.

3.3 REFURBISH

The *Refurbish* obligation involves refurbishment or expansion of existing assets. These existing assets may have been recently built another contractor or may have been in place for some time. *Refurbish* involves similar risks to the *Build* obligations, while the presence of existing assets raises a number of additional risks associated with

- The condition of existing assets - their lifecycle, appropriateness for the intended purpose and for the refurbishment or expansion works planned. There may not be an up to date asset register or any other record of the condition of those assets, and therefore this risk can be difficult to manage.
- Any latent defects that may exist in the existing assets– even where the assets have been well maintained, defects may exist from their manufacture or construction. With existing works, it is often difficult to identify such defects, or to confirm the quality of existing construction. Also, the construction contractor for those works is unlikely to make available warranties as to the quality of the works unless such warranties are obtained in advance of the work they perform.
- Design of the existing assets and interfaces with the refurbishment, since the new works must interface with the design of the existing works, the materials used, the technology adopted, etc. The design of the existing works may limit the design options for the refurbishment of those works,

limiting the technology that can be adopted, the construction methodologies that can be followed and the materials that can be used.

- Permits or regulations applicable specifically to the existing works, that would limit the use, change in use or refurbishment of those existing assets.
- Existing site and environmental conditions, often associated with the construction or use of existing works, for example the presence of asbestos, or the disposal on the site of chemical waste.
- The appropriateness of those existing assets for the works to be built, for example do the existing works fit with the technical solution or design of the new works such that the completed, refurbished works will perform in accordance with applicable specification.

In general, a *Refurbish* project raises the risk that the nature of the existing assets will cause a delay, increased cost of or reduce the performance of new works. The project company will generally have limited time or opportunity to review existing works and is likely to have limited information on the existing works, their conditions and any existing defects.

4. Private funding

A project is *Finance* when the project company must provide a material amount of private financing in the early stages of the project, that cannot be addressed using available project revenues, for example:

- Predefined, upfront financing of construction obligations, equipment or supplies
- Investment needed to address operating losses until the revenue stream can be improved or costs reduced
- A purchase price for the project, land or other essential assets, paid to the grantor or anyone else

- An obligation to refinance existing debt.

Therefore, *Finance* would not include normal funding facilities associated with the project company's business, for example working capital facilities, or lines of credit to be sourced at some point in the future but with no firm undertaking by lenders (e.g. financial close) in the beginning of the project.

Risks associated with a *Finance* obligation relate primarily to the availability of funding, cost of funding, the cost and time associated with arranging funding and the risk that the project will not be able to satisfy debt service obligations. Lenders will have their own requirements for the project, the security rights they will seek and any undertakings required from the grantor and shareholders.

The risks associated with *Finance* will depend partly on the nature of the funders (debt and equity) and its influence on the project. Each funder (whether domestic or foreign; private, public or institutional; bank or non-bank) will have its own particular requirements, interests, concerns and strengths. Integral to the provision of debt to the project company is the need for the project company to give up control of its assets, finances and even operations to the lenders, who will want to keep control of certain of these key decisions, and of the monies available to the project company.

The classification methodology uses the term *Finance* to include both debt and equity funding.

4.1 SOURCES OF FINANCING

A PPP project will involve financing from various sources, in some combination of equity and debt.

Equity contributions

Equity contributions are funds invested in the project company which comprise its share capital and other shareholder funds. Equity holds the lowest priority of the contributions, e.g. debt contributors will have the right to project assets and revenues before the equity contributors can obtain any return; or, on termination or insolvency, any repayment, and equity shareholders cannot normally receive distributions unless the company is in profit. Equity contributions bear the highest risk and therefore potentially receive the highest returns.

Debt contributions

Debt can be obtained from many sources, including commercial lenders, export credit agencies, bilateral or multilateral organisations, bondholders (such as institutional investors) and sometimes the host country government. The source of debt will have an important influence on the nature of the debt provided. Unlike equity contributions, debt contributions have the highest priority amongst the invested funds (e.g. senior debt must be serviced before any other payments are made). PPP generally involves the construction of high value, long life assets with stable revenues, and therefore seeks long-term, fixed interest debt.

Mezzanine/subordinated contributions

Located somewhere between equity and debt, mezzanine contributions are accorded lower priority than senior debt but higher priority than equity. Examples of mezzanine contributions are subordinated loans and preference shares. Subordinated loans involve a lender agreeing not to be paid until more “senior” lenders to the same borrower have been paid, whether in relation to specific project revenues or in the event of insolvency. Preference shares are equity shares, but with priority over other “common” shares when it comes to distributions. Mezzanine contributors will be compensated for the added risk they take either by receiving higher interest rates on loans than the senior debt contributors and/or by participating in the project profits or the capital gains achieved by project equity.

Project Finance

One of the most common, and often most efficient, financing arrangements for PPP projects is “project financing”, also known as “limited recourse” or “non-recourse” financing. Project financing normally takes the form of limited recourse lending to a specially created project vehicle which has the right to carry out the construction and operation of the project. Limited recourse means that the lenders look only to the assets and revenues of the project for repayment of debt and interest; and not to the shareholders. One of the primary advantages of project financing is that it can provide off-balance sheet financing, which will not affect the credit of the shareholders or the grantor, and shifts some of the project risk to the lenders in exchange for which the lenders obtain a higher margin than for normal corporate lending. This motivates the lenders to require a detailed assessment of risk management and allocation before financing is committed to the project. Thus major project challenges are identified and addressed early in the project. Normal

public procurement does not achieve this, leaving risks to be discovered later, often when it is too late, or far more costly to address.

4.2 LENDING

The profile of a lender group can range from project to project, and may include a combination of private sector commercial lenders together with export credit agencies, and bilateral and multilateral finance organizations. These international, often political, entities are frequently involved in PPP projects and can have an important impact on the risk allocation and financing used in a project. When involved in such projects, these agencies will place strict requirements on the project structure and lending arrangements, in particular in relation to environmental and social safeguards). Lenders anxious to benefit from such involvement (and the potential mitigation of political risk) will make it a priority to ensure that these requirements are satisfied.

Funding is sometimes provided by project bonds, sold on the capital markets, or by sovereign wealth funds and other financial intermediaries. As a general premise, the lenders will only want to take those risks which are measurable and measured. The lenders will not be in the operation, construction or insurance business and therefore will not want to bear risks with which they are unfamiliar and which are more appropriately borne by other parties. Nevertheless, the lenders will be involved in most of the important phases of the works, including the financial structuring, the drafting of the project documents and certification of completion. They will generally maintain their review powers over the project with the assistance of an independent engineer (a specialist technical adviser who monitors construction and approves completion of milestones, amongst other things). The lenders may require that direct agreements be entered into between themselves and each of the project participants.¹²

The terms and conditions that lenders will be willing to give for a specific project will depend primarily on the nature of the borrower, in particular the borrowers credit position and the nature of any other security, credit enhancement or support the project may have. However, the nature of the lender will have a lot to do with the terms and conditions offered. For example,

¹² For further discussion, see chapter 29 of Scriven, Pritchard and Delmon (eds), *A Contractual Guide to Major Construction Projects* (1999).

- The conditionalities applied to any loan will depend very much on the goals of the lender. Commercial lenders will apply conditionality focused on improving revenues, managing costs and protecting the lender's cushion. Lenders whose focus is national interests, for example encouraging exports such as export credit agencies, will focus more on the nationality of contractors and suppliers and their interests. Finally, lenders whose reason for being is tied to development will be concerned more with sector reform, economic growth and poverty reduction.
- Bankability requirements and lender appetite will depend on the nature of the lender, their existing loan portfolio, their strategy for portfolio development and their desire to enter into new markets. Lenders will react to political risk in different ways, those familiar with the country or a region may approach the risk in a less risk-averse manner than others. Lenders with a bilateral or multilateral origin may have better relationships with the relevant government, and will therefore view political risk in a different way.
- Price and fees will clearly vary based on market practice and on the nature of the lender in question. Similarly, some lenders will be more efficient than others, and therefore the cost to the borrower of managing lender involvement and due diligence can differ significantly. For example, some lenders will accept common lender technical and legal advisors, while others will insist on having their own lawyers and technical team.
- The flexibility exhibited by different lenders can vary, for example the ability of the borrower to renegotiate or reschedule debts terms and conditions. To this extent, banks are usually more flexible than bondholders.
- The complexity, sophistication of the type of debt available to borrowers will depend on the nature of the lender, their experience in such products and the depth of financial market in which the lender operates (see section 4.4 for further discussion of this issue).

Lenders will often not act alone, and the grouping of lenders, the relative weight of each lender's involvement and the role such lenders play will have a significant influence on the nature of the debt available. For example, some lenders act as

arrangers, providing the service to the borrower of interfacing with different lenders and helping to coordinate access to debt. This may involve underwriting, according to which the lender promises to provide access to all of the debt needed. Lenders may choose to club together, whereby they will agree amongst a small group of lenders to each take a certain proportion of the project requirements. Once a lender has agreed to provide debt, it may choose to syndicate some or all of its position, by selling its debt onto the financial market to other lenders. Where multiple lenders are involved in a project, they will agree together on a common lender position on certain issues, for example management of security rights, which is usually formalized in an intercreditor agreement.

4.3 EQUITY INVESTORS

The sponsors will identify a project and put together a bid in an effort to be awarded the project. This typically means the private sector investors will create a new company (the “project company”) – usually a limited liability special purpose vehicle (SPV) - which will contract with the grantor to design, construct, operate, maintain and transfer the project. The use of an SPV is likely to enable the sponsors to finance the project on a limited recourse basis. The grantor may require that the project company includes local investors in order to improve transfer of technology, and provide jobs and training to local personnel. Most shareholders will want to be able to divest their shareholding as early as possible, in particular commercial/construction companies that are not accustomed to long-term shareholding. The grantor, on the other hand, will want the shareholders tied to the fortunes of the project company as long as possible, to align their interests more with those of the grantor (a financially viable project over the long term). Shareholders of the project company will often be both shareholder in the SPV and a contractor to the SPV. This conflict of interest will need to be managed amongst the shareholders, the grantor and the lenders, for example the conflicted shareholder should not be in a position to negotiate or influence the negotiation of their contract or set prices.

The nature of equity investors (public, private or mixed) in the project company will have specific relevance to the decision making within the project company, for example through the allocation of shareholder voting rights, right to elect board members, minority shareholder rights, different classes of shares, control through subcontracts and outsourcing. Rights, shares may be controlled through trusts or other vehicles, possibly to provide lenders with additional security. The

shareholding arrangements are often complex, including the use of multiple subsidiaries, cross-shareholding, etc. These structures are often developed to improve accounting and tax efficiency.

The project company may also be subject to public control, for example through a joint stock company. This approach, while not common globally, is found in many developing countries. Key challenges associated with government shareholding in the project company include conflicts of interest between the government as shareholder and the government as grantor, for example difficulties for the government as shareholder to agree for the project company to sue the government as grantor.

5. Service delivery

The project company may be required to deliver services in bulk to a single offtake or ("*Bulk*"), or directly to consumers ("*User*"). Under a *Bulk* project, the project company delivers services to a utility or a single off-taker, the project company's obligations and the management of the service delivery is generally more straightforward. A *Bulk* project usually means that the project company is not responsible for customer service, mitigating social risk, the implications of social policy and a comprehensive intervention of a regulatory authority.

A *User* project involves a project company that delivers services directly to consumers, with all associated customer service, billing and collection risks. This involves a complex relationship with individual consumers, consumer groups, the local community, and political authorities associated with those consumers, in particular regulatory authorities. The definition of service delivery and the mechanisms for monitoring and managing that service delivery may need to be flexible in order to adapt as consumer requirements change, for example as demographics change.

So, the construction and operation of a power generation facility that delivers electricity to the local utility would be a *Bulk* project; while the running of a water utility, delivering water to consumers would be a *User* project.

It should be noted that a variety of services may fall under the *User* structure. A *User* project may only require the project company to take on billing and collection

obligations, with no real service provision to consumers.¹³ Equally, a *Bulk* project places an obligation on the project company to deliver services to the grantor or an offtaker. However, often, the revenue stream for a *Bulk* project comes from the grantor or offtaker, but the service is delivered to consumers (a *User-Fee* project). The credit risk of the offtaker may suffer if it is not able to collect from consumers, or if consumer tariffs are too low (see discussion below of revenue sources).

5.1 BULK

Bulk is generally less risky for investors and lenders alike. Risk assessment is easier in *Bulk* projects, where offtake or credit risk, demand history, etc. is easier to analyze. *Bulk* delivery will involve managing the operation of the project, providing maintenance for and replacing materials and equipment, receiving and managing inputs and developing the relationship with the offtake purchaser.

Bulk risks will include:

- Performance risk - the proper operation and maintenance of the works to achieve the required levels of output or availability. Where the works do not operate at the levels required, the offtake purchaser will, unless it is at fault, have some right to withhold payments or collect damages from the project company in relation to the amount of the damages incurred, or (subject to certain requirements) terminate the offtake purchase agreement.
- Increase of cost risk - including the effects of inflation, increases in the market price of materials or labor or increases in the cost of other required services, such as insurance.
- Operation risk - operating the project in accordance with the standards and performance levels set out in the concession and the offtake purchase agreements, including the impact of defects associated with the construction of the works, shortcomings in inputs (such as fuel and chemicals) used to produce outputs, etc..
- Political risk – including the risk of change in the political climate of the host country. The project company's methods of operation and its

¹³ This formulation is used in water and electricity distribution systems to help improve billing and collection where public utilities are often weak.

relationship with its employees and the local and national communities will be under close observation by both the local population and the host government to ensure that the services rendered by the operator are consistent with public expectations. The project company's services can have an impact on the popular perception of the grantor.

- Commercial interfaces – the project company will need to liaise with all of the project participants, manage the input and output needs of the project, and manage the transfer of care for the project from the construction contractor at completion of construction and to the grantor at the end of the concession period. These project participants include:
 - Operation and maintenance (O&M) contractor – the project company may outsource some of the operation tasks to an O&M contractor. In this event, the project company will need to manage carefully the interfaces with this contractor to ensure proper performance.
 - Construction contractor – the project company will be responsible for delivery of services and output, therefore the performance of the construction contractor (whether or not hired or paid by the project company) will be key to fulfilling these obligations. The project company will therefore want to manage carefully the construction contractor's activities, and testing the completion of the works to avoid the need to address defects or performance shortfalls.
 - Offtake purchaser – the purchaser of the output or services provided by the project company. The offtake purchaser and the project company will need to maintain a constant relationship throughout the concession period. They will need to develop an efficient mechanism to facilitate the communication to the project company of the offtake purchaser's needs. The parties will then have to organize the delivery and receipt of the output provided, including inspections and testing.
 - Input supplier – the supplier of materials, equipment, spares, fuel, electricity and any other inputs needed to produce the services or outputs to be sold to the offtaker,

- Grantor - The grantor will have an interest in the proper operation and maintenance of the project, to ensure that the assets it receives at the end of the concession period are in an appropriate condition and will not require extensive replacement or repair. Therefore, during operation, the grantor may wish to review to some extent the testing carried out, and to perform testing of its own, on the works to confirm the general operating condition of the project; although it will probably not want to be involved in the more detailed testing.

5.2 USER

The *Bulk* approach does not necessarily provide the flexibility and range of services sought from PPP, for example where the grantor wants to improve service distribution in public utilities like water, power, waste collection and fixed line telecommunications. For this reason, *User* structures have become more common, permitting the grantor to involve the project company in

- Implementing modern management approaches, particularly where the company's historic operating methods are unnecessarily labor intensive and not orientated towards the needs of consumers
- Improving distribution capacity, reducing leakages/losses, improving billing/collection and providing long term maintenance to ensure that the condition of the distribution system is consistently monitored and improved.

A project company undertaking a *User* project will encounter certain issues which are not commonly encountered in *Bulk* projects. The following is a discussion of a few of these issues.

Future expansion

The need for capital expenditure over the life of a *User* project may not be clear at commencement of the project. Therefore, the project arrangements must be flexible to allow the project company to manage the circumstances encountered on site, rather than being bound to a strict scope of works to be built or improvements to be made. The obligations placed on the project company will more likely reflect general obligations, e.g. to improve the quality of services delivered, reduce

losses/leakage and improve cost recover through tariffs. This may necessitate the project company agreeing with the grantor on rolling programs for capital investment against an investment program or budget based on the amount of income obtained by the project company or as required to satisfy the performance criteria placed on the project company. The permitted level of tariffs charged to consumers is also likely to have an important impact on the value and nature of capital works undertaken by the project company. This means that the project company may only be committed to mobilize financing at bid stage for the first works program.

Existing assets

The grantor will usually transfer ownership, or use, of existing assets to the project company (whether or not this involves a transfer of legal title) for the purpose of performance of its obligations. These assets may not be identified and categorized before the project company takes over control. Further, the condition of those assets and need for replacement or refurbishment may not be clear until well into the project. The condition of existing assets represents a serious risk for the project company and one which it will be difficult to pass on to any construction contractor or operator. The grantor's requirements will need to allow the project company sufficient flexibility to manage these conditions.

Tariff levels and payments

The level at which tariffs are set for services can be an extremely political issue. Historically, utility tariffs may have been used to subsidize certain elements of society, specific industries or public sector entities. More often, public utilities are subsidized and tariffs are not charged, charged at very low rates or not collected. PPP may necessitate formal arrangements with the project company for government subsidies or financing, particularly where the government is not willing to put tariffs up to profitable levels or where substantial investment in capital works is needed or desired. Though challenging, this can be a healthy transition for the utility, formalizing the subsidy for the water sector and rendering transparent the burden on the public purse represented by artificially low tariffs. While this will be of particular concern for the *Fee vs Tariff* paradigm discussed below, it is also important for setting tariffs and any tendency to politicize this function can complicate the project company's task of invoicing consumers and collecting tariffs.

Regulation

In order to protect consumers and ensure that key infrastructure is operated to a standard consistent with modern industry practice, the grantor may want to establish a progressive and reasonable regulatory structure, giving the regulator sufficient latitude to supervise the activities of the project company without unreasonably restricting competitiveness or the ability of the project company to operate or finance its activities within the context of the market. Creating a regulatory structure can involve a substantial investment of resources by the grantor or the government.

Equally, in view of the political, health and safety sensitivities triggered by infrastructure services, the grantor or some other public sector entity will need to monitor carefully the sector and therefore the project company's operations. This may involve regulating, for example, the level of tariffs to be charged to customers, the performance of the project company's operations, or the standard of services to be delivered for public consumption.

Regulation is of particular interest for the operation function as the regulator is likely to need to work closely with the project company, and to impose record keeping, reporting, application and other procedural requirements on the project company as part of the regulatory function. This will complicate the project company's management task.

6. Source of revenue

The private sector will seek a secure revenue stream to ensure repayment of debt (and hence lower interest rates) and profitability over time. Given the limited sources of revenues, and structure of financing, any reduction in revenues has a direct and significant impact on the ability of the project company to repay debt and on the return the shareholders will earn on their investment. Therefore, when structuring a project, the private sector will want to see a clearly defined revenue stream, limiting as much as possible the risk that calculations of revenues or tariffs will not achieve the levels anticipated.

“*Fee*” relates to a revenue stream originating from one offtaker/public entity. This structure provides the project company with simplified billing and collection, and assessment of credit risk.

“*Tariffs*” relates to a revenue stream sourced from consumers. A project company with a *Tariffs* revenue profile will face more complex billing, collection and credit risk due to the interfaces with consumers and the large number of offtakers. This complexity will complicate the due diligence process, requiring to assess demand profiles, collection rates, opportunities to improve billing and collection and assessment of late payments and the ability to sanction nonpayment and non-performing debts.

So, the construction and operation of a power generation facility that sells electricity to the local utility would be a *Fee* project. While a project company delivering water to consumers and collecting tariffs from them would be a *Tariffs* project.

6.1 FEE

A *Fee* arrangement provides for a purchaser (usually a sole entity) to manage market risk of demand and price for project output (including products and services). The purchaser is generally a local utility, public service provider or operator which will purchase the output from the project company and then use the output for its own purposes or sell the output, either directly to end users or to other aggregators.

The purchaser will enter into an agreement with the project company to use and pay for project output. The purchase agreement defines and delimits the revenue stream to be received by the project company over the life of the project. It will define not only the amount of the revenue stream but also when it can be interrupted, modified or terminated. A common method of defining the amount to be paid by the purchaser to the project company is by way of a dual payment system, commonly including a capacity (or availability) charge and a usage (or offtake) charge.

The capacity charge is that amount paid by the purchaser to the project company for making the project available to the purchaser and on the amount of capacity the project places at the disposal of the purchaser. For example, a PPP hospital project

would include a capacity payment based on the availability of hospital facilities to the purchaser irrespective of actual usage.

The capacity charge will compensate the project company for the fixed costs it incurs in producing the output including, for example, financing charges, labor and insurance. Therefore, no matter what amount of output the purchaser decides to draw, it must pay for the fixed costs of the project company in consideration of the project company making the project available to the purchaser. Where the project does not perform sufficiently well and does not make available the capacity required, then the capacity charge can be reduced.

The usage charge is that paid for the amount of project output actually taken, or used, by the purchaser during the payment period. This payment will cover the variable costs of operation, such as the cost of input, some or all of the equity return and variable maintenance costs. The input cost may simply flow through to the purchaser; however, care should be taken in case the cost of input increases owing to inefficiency of the project, such as high heat rate in the case of a power plant (where the power plant requires more fuel per unit of energy than was intended, or where the fuel is of an insufficient quality requiring more fuel to be burned).

Fee projects involve only one or a limited number of large offtakers, which simplifies the assessment of revenue risk, including collection risk and credit risk of offtakers. It also allows long-term, financially viable offtake arrangements to protect investors from demand and market risks (where offtakers have more familiarity and are more comfortable with these risks).

6.2 TARIFF

A *Tariff* project involves greater exposure of the project company to market risk. When collecting tariffs from consumers, the project company will need to manage risks associated with:

- Demand for output and services, including changes in demographics, technology and usage patterns
- Tariff levels, in particular where a regulator sets or adjusts or approves adjustment of tariffs

- Billing, including identifying consumers, keeping track of consumption/metering, and delivering billing statements
- Collection of debts due, including the physical process of collecting bills, the credit risk of consumers, and the design and implementation of penalty mechanisms for those who fail or refuse to pay.

The demand profile is often very difficult to assess. For example, demand for transportation infrastructure is influenced by competing modes of transportation, demographic shifts, economic conditions, the cost of the facilities to end-users, convenience, individual preference, speed and a number of other, often interrelated factors that make accurate demand forecasting difficult at best. The inherent vulnerability of traffic forecasts to optimism bias was demonstrated in a Standard & Poors study from 2002 of traffic forecasts in user-fee based toll road schemes, in particular out of 32 different projects, actual traffic was on average only 70% of that forecast, with a large majority of projects not reaching even 90% or the forecast traffic. Lenders achieved the greatest accuracy in their forecasts, but still only achieved an 82% performance ratio, while sponsors and investors were down at 66%.

Tariff levels and payments

The level at which tariffs are set for services can be an extremely political issue. Historically, utility tariffs may have been used to subsidize certain elements of society, specific industries or public sector entities. More often, public utilities are subsidized and tariffs are not charged, charged at very low rates or not collected. PPP may necessitate formal arrangements with the project company for government subsidies or financing, particularly where the government is not willing to put tariffs up to profitable levels or where substantial investment in capital works is needed or desired. Though challenging, this can be a healthy transition for the utility, formalizing the subsidy for the sector and rendering transparent the burden on the public purse represented by artificially low tariffs.

Regulation

Regulation is of particular interest for the operating function, as the regulator is likely to need to work closely with the project company to establish a baseline of data to be used for tariff setting, arguing for additional tariff increases, coordinating tariff with capital investment plans and responding to changes in law

and the requirements for improved performance through additional investment. This will complicate the project company's assessment of financial viability and profitability of the project, which will be subject to the risk of tariffs set below anticipated or required levels.

Rights of collection

Where the project revenue stream comes from tariffs charged by the project company directly to consumers, the risk of collection shortfalls must be allocated. Where the project company is to bear this risk, the project company will need to have the right to collect tariffs directly from consumers and to impose sanctions on consumers for failure to pay tariffs, although in certain cases such sanctions may not be effective. For example, in certain legal systems it may be unlawful or impossible to cut off the services supplied to certain public establishments, such as schools and hospitals, or to individual households in which, for example, resides a registered dialysis patient.

Improving billing and collection can be politically challenging. In many cases, the people that do not pay their bills are government agencies who may feel that public agencies should not pay for public services. However, once PPP is implemented, those public agencies are generally expected to pay their bills. It will be difficult for a private sector operator to confront a government agency (for example, the Ministry of Defense or the Police Department) and demand payment.

Exclusivity

Where the project company's revenue source is to be generated from the tariffs collected from consumers in a given area, or where the rate of use of services consumed dictates a part of the payment stream, the project company may seek an exclusive mandate to provide the services within that area. This may be difficult for the grantor to accept where it wishes to cultivate competition and create as realistic a free market as possible. The grantor will need to consider carefully the issue of exclusivity and where exceptions to such exclusivity might arise.

7. Application of the Model to the Case Studies

The following applies the classification model to a number of case studies to see how projects from different regions and sectors can be categorized in practice and how this will help compare across these different projects.

- Dhabol power generation project
- East Manila water concession
- Thames water privatization
- Santiago – Valparaiso tollroad
- Pulkovo airport
- Athens airport
- Royal Victoria Infirmary and Freeman Hospital
- TANESCO management contract
- Cartagena water project
- Southern Africa regional gas project
- São Paulo metro line 4
- Skikda desalination project
- Zagreb-Macelj tollroad
- Panagarh to Palsit tollroad
- Orlovski Tunnel concession

These are well known projects with sufficient information available publicly to permit open discussion without betraying confidentiality, and represent a cross-section of sectors and project structures.

These case studies cut across some familiar lines, in particular those that demonstrate common terminology confusion. Projects that are usually thought of as relatively standard “Build-Operate-Transfer” or “BOT” projects turn out to have different characteristics, differences that might be missed when using classical terminology. Some of these “BOT” projects are actually closer in design and commercial drivers to some arrangements often thought of as “concessions”. Equally, the case studies demonstrate the significant differences between various forms of “concession”, for example

- A Russian tunnel “concession” – *New-Build-Finance-User-Fee*
- A Greek airport “concession” – *Existing-Build-Finance-User-Tariff*
- A Chilean road “concession” – *Existing-Refurbish-Finance-User-Tariff*
- A Filipino water “concession” – *Existing-Refurbish-Finance-User-Tariff*
- A Brazilian Metro “concession” – *New-Finance-User-Tariff*

The case studies also show the important variances within sectors, and similarities between some projects in different sectors that are not often considered when analyzing the opportunity for cross-fertilization in the design of PPP projects. For example, the case studies include:

- Two hospitals, one with the project company delivering just the facilities, with the grantor providing medical services (*New-Build-Finance-Bulk-Fee*). The second has the project company providing all services (*Existing-Build-Finance-User-Fee*).
- Two power projects, one a classic IPP (*New-Build-Finance-Bulk-Fee*), and the other the outsourcing of management functions (*Existing-User-Fee*) and one gas pipeline (*New-Build-Finance-Bulk-Fee*).
- Four water projects, one called a concession (*Existing-Refurbish-Finance-User-Tariff*), one called a privatization (*Existing-Finance-User-Tariff*), one called a PPP project (*Existing-Refurbish-Finance-User-Tariff*) and one a desalination plant (*New-Build-Finance-Bulk-Fee*).

- Two airports, one a new build (*Existing-Build-Finance-User-Tariff*) and the other a refurbishment of an existing airport (*Existing-Refurbish-Finance-User-Tariff*), one metro (*Existing-Finance-User-Tariff*), and three toll roads, two toll-based refurbishments (*Existing-Refurbish-Finance-User-Tariff*) and the other an annuity or availability payment new build (*New-Refurbish-Finance-User-Fee*).
- The model also shows the structural similarities between the Manila water concession (*Existing-Refurbish-Finance-User-Tariff*), Thames water privatization (*Existing-Finance-User-Tariff*), and the Cartagena water PPP (*Existing-Refurbish-Finance-User-Tariff*), yet they are each known by a different name: concession, privatization and PPP respectively.

7.1 DHABOL POWER CORPORATION, INDIA

Pursuing a policy of economic liberalization by the Indian government to open up the electricity sector to foreign investment, a senior Indian delegation invited Enron, along with other international investors to participate in the country's sector reform. As a result, the Power Purchase Agreement (PPA) for the Dhabol Power Project was signed in 1993 for a \$2.8 billion combined-cycle 2,000 megawatt LNG power plant in Maharashtra, India's third largest state. Under the renegotiated PPA in 1995, Enron, GE and Bechtel, through their 8-1-1 joint-venture Dhabol Power Corporation (DPC), signed a take or pay off-take agreement to sell all the electricity to Maharashtra State Electricity Board (MSEB) for 20 years. The MSEB PPA is counter-guaranteed by the state and federal governments.

Since the Dhabol project went through various iterations, this paper will use the original structure as a basis for analysis.

BUSINESS	CONSTRUCTION OBLIGATIONS	PRIVATE FUNDING	SERVICE DELIVERY	SOURCE OF REVENUE
New	Build	Finance	Bulk	Fee
Existing	Refurbish		User	Tariffs

BUSINESS – New: The project involves the construction of a power plant facility on a Greenfield basis by the project company and assumes no previous or existing business or customers.

CONSTRUCTION OBLIGATIONS – Build: The project company, Dhabol Power Company (DPC), assumes significant risk in association with the construction of a new power plant; these involve inherent risks during the construction of a major infrastructure project, including geological and design risk, cost overruns, delays etc.

PRIVATE FUNDING – Finance: The project entitles significant contribution from the consortium in the form of equity and diverse sources of financing including commercial banks, export credit agencies (ECAs).

SERVICE DELIVERY – Bulk: Project Company DPC is responsible for delivering services directly to a sole offtaker, in this case public entity Maharashtra State Electricity Board (MSEB), and does assume additional responsibility for customer service

SOURCE OF REVENUE – Fee: Since revenue stream for the project originates from a sole offtaker, in this case public entity Maharashtra State Electricity Board (MSEB), and the project company does not assume responsibility for customer service.

7.2 EAST MANILA WATER CONCESSION, PHILIPPINES

In February 1997 the Government of the Philippines awarded a contract to the Manila Water Company (MWC), a consortium lead by Ayala Corporation (Philippines) to operate and expand the water supply and waste water system of Manila's East zone, comprising a total population of 4.5 million and about 70% of the total city coverage.

Under the 25-year contract, MWC was responsible for the provision of water and sewerage and to expand services to additional households according to specific and pre-agreed set of annual targets defined by zone; MWC also assumed a large portion of the debt burden of the public utility (MWSS) and offered large rebates on the existing tariffs.

Despite high investment costs, MWC was able to make a remarkable turnaround in service access and reliability, water loss reductions and overall operational efficiency; MWC also achieved financial turnaround with increasing profitability from 2001 onwards leading to a successful IPO, and subsequent competition for PPP contracts in the region.

The East Manila Water concession has often been hailed as the largest water concession in the world and it is an example of a successful public-private partnership despite its high investment costs. The transaction has been recognized for its transparent bidding procedure, a best practice example for its robust and transparent regulation, its ability to survive the 1997 Asian Financial Crisis and most of all, for achieving a remarkable turnaround in service access and reliability, water loss reductions and overall operational efficiency in Manila.

BUSINESS	CONSTRUCTION OBLIGATIONS	PRIVATE FUNDING	SERVICE DELIVERY	SOURCE OF REVENUE
New	Build	Finance	Bulk	Fee
Existing	Refurbish		User	Tariffs

BUSINESS – Existing: The project involves taking over management of Manila’s existing utility, the Metropolitan Water and Sewerage Services (MWSS) by Manila Water Company Inc (MWC). Under the contract MWC was responsible for responsible for the provision of water and sewerage services to existing customers for the city’s East Zone; MWC also agreed to expand service to additional households according to specific and pre-agreed set of annual targets defined by zone. When MWC took over operations in 1997 it faced major coverage and quality problems inherited, including MWSS’s precarious financial situation.

CONSTRUCTION OBLIGATIONS – Refurbish: The project company assumes refurbishment and expansion of existing assets owned by MWSS and the risks related to their current condition.

PRIVATE FUNDING – Finance: The project required very large commitments from MWC which included \$ 2.72 billion in investments and \$ 222 million in concession fees. Along with the contract, was MWC’s responsibility of assuming a portion of the utility’s outstanding liabilities in the form of equity and diverse sources of financing including commercial banks. The transaction is therefore categorized as “*Finance*.”

SERVICE DELIVERY – User: MWC deliver services directly to consumers and is responsible for collection and billing obligations as well as customer service.

SOURCE OF REVENUE – Tariffs: Revenue stream originates from consumers; the project company assumes collection and billing obligations as well as customer service.

7.3 THAMES WATER, UK

Thames Water plc is the largest water and wastewater services company in the United Kingdom, with more than 13 million customers in England and Wales. The company was in hands of the public sector (Thames Water Authority) until 1989 when it was privatized with transfer of its regulatory, river management and navigation responsibilities to the National Rivers Authority, which later became part of the Environment Agency. The newly privatized water industry remained strictly subject to governmental control and regulation, including annual specific quality standards of the UK and the European Commission, and a mandatory capital investment program to improve existing inadequate infrastructure inherited by Thames. Over time, the company diversified its portfolio and took over several water supply utilities and also started to offer consulting, infrastructure, project management, engineering, and maintenance services. Thames Water was acquired by the RWE Group, a German conglomerate in 2001 and then sold to Kemble Water Ltd., formed by a group of investors led by Australia's Macquarie Group, in December 2006. Like other water companies, Thames saw its share of controversy as it tried to strike the balance between the public duty of a monopoly utility, the influence of the regulatory agency and the profit motive of the private sector.

BUSINESS	CONSTRUCTION OBLIGATIONS	PRIVATE FUNDING	SERVICE DELIVERY	SOURCE OF REVENUE
New	Build	Finance	Bulk	Fee
Existing	Refurbish		User	Tariffs

BUSINESS – Existing: The transaction involved the privatization of the Thames Water, which until 1989 was in hands of the public sector (and referred as Thames Water Authority). The company therefore had an existing demand from about 7 million customers, an existing stream of revenues and tested cost data.

CONSTRUCTION OBLIGATIONS – N/A

PRIVATE FUNDING – Finance: Since the transaction involved transferring ownership of a the company’s assets (divestiture) to private sector investors it is categorized as *Finance*.

SERVICE DELIVERY – User: Thames Water deliver services directly to consumers and is responsible for collection and billing obligations as well as customer service

SOURCE OF REVENUE – Tariffs: The utility is responsible for billing and collecting revenues directly from its large number of customers.

7.4 SANTIAGO - VALPARAÍSO – VIÑA DEL MAR TOLL ROAD (RUTAS DEL PACIFICO), CHILE

The Route 68 concession, joining Santiago with Valparaíso and Viña del Mar is an innovative example of a successful example of the large concession program which has been carried out by Chilean Government since the early 1990’s. The project consists on the engineering, construction, upgrade, operation, and maintenance of the existing 109 km Ruta 68 toll road, which connects Santiago with the Port of Valparaiso and the Viña del Mar region in Chile. The total financing costs for the project was about US\$ 427 million, of which about US\$ 103 million was provided by sponsors ACS and Sacyr. The project used a least present value of revenue

(LPVR) auction mechanism and was the first example in which urban highways were implemented with free-flow inter-operable toll charges with four different project companies. Under the scheme, the regulator fixes user fees and announces a discount rate, and the franchise is awarded to the firm that bids the least present value of toll revenue. The franchise ends when the present value of toll revenue is equal to the winning bid. The LPVR mechanism allows for fair compensation if parties wish to terminate the contract early. The concession started in August 1998 and has a maximum term of 300 months. The toll road was opened in 2001.

BUSINESS	CONSTRUCTION OBLIGATIONS	PRIVATE FUNDING	SERVICE DELIVERY	SOURCE OF REVENUE
New	Build	Finance	Bulk	Fee
Existing	Refurbish		User	Tariffs

BUSINESS – Existing: Rutas del Pacifico entails the improvement of an existing toll road of 109 km between the capital Santiago and Valparaiso, plus the construction of a new 20 km road section (Troncal Sur) connecting several towns with the city of Viña del Mar. The project also includes the maintenance of existing Route 60 and construction of two 5km tunnels. The existing highway was built and maintained by the Chilean ministry of public works. Tolls were charged to users, therefore there was an existing demand and revenue stream derived from the project.

CONSTRUCTION OBLIGATIONS – Refurbish: The project company is responsible for the construction of a new 20 km section and auxiliary civil works; however, the main component is the overall expansion and improvement of the existing 109 km Santiago-Valparaiso highway.

PRIVATE FUNDING – Finance: The total financing costs for the project was about US\$ 427 million of which about \$103 million was provided by sponsors ACS Chile S.A. and Sacyr Chile S.A. As part of the financing, Rutas del Pacifico (SPV) issued bonds in local currency for about \$ 75 million backstopped with an IADB guarantee.

SERVICE DELIVERY – User: The project company delivers services directly to the toll road users and is responsible for handling customer service.

SOURCE OF REVENUE – Fee: The project company obtains cash flows directly from the toll roads users, mainly from light vehicles (75%) in this particular case.

7.5 THE PULKOVO AIRPORT EXPANSION PROJECT, RUSSIA

In early 2008, the St. Petersburg City Government together with the Pulkovo Airport Company initiated the bidding process for a 30 year PPP project to expand, operate and maintain the Pulkovo International Airport (“Pulkovo”).

Pulkovo, located 16 km south of St. Petersburg, is Russia’s fourth busiest airport in terms of passenger flow, servicing over 6 million people in 2007 and 66 airlines regularly. The project aims to address the airport’s rising capacity constraints and cater to forecasted growths in passenger and cargo traffic expected in the next 30 years. The project involves the construction of a centralized passenger terminal which will concentrate all main operations of scheduled and charter passengers, both international and domestic; the reconstruction of certain other existing buildings and structures of the landside facilities; construction of new buildings and structures of the landside facilities (hotel, parking, access roads); and reconstruction of part of existing airside facilities (expansion of the airfield, new apron, runways and taxiways construction).

BUSINESS	CONSTRUCTION OBLIGATIONS	PRIVATE FUNDING	SERVICE DELIVERY	SOURCE OF REVENUE
New	Build	Finance	Bulk	Fee
Existing	Refurbish		User	Tariffs

BUSINESS – Existing: The transaction entails the expansion of the existing Pulkovo Airport of St. Petersburg to address the airport’s rising capacity constraints and cater to forecasted growths in passenger and cargo traffic expected in the next 30 years. The project company will essentially take over an existing

business with a tested and existing (but growing) air traffic demand, as well as historic financial records and stream of revenues.

CONSTRUCTION OBLIGATIONS – Refurbish: The project entails the construction of a centralized passenger terminal and the reconstruction of certain other existing buildings and structures of the landside facilities. The project company assumes risks such the existing condition and latent defects of the assets.

PRIVATE FUNDING – Finance: Although it is unclear the financial plan of the project, it is likely that it will require a combination of both equity and debt from the project company, who is yet to be defined.

SERVICE DELIVERY – User: It is envisaged that under the proposed structure the project company will provide services directly to its customers from airside (airlines) and landside operations.

SOURCE OF REVENUE – Tariffs: The project company will obtain revenues directly from users / customers airside (airlines) and landside operations.

7.6 ATHENS INTERNATIONAL AIRPORT, GREECE

In July 1995, the Government of Greece and a private consortium led by HOCHTIEF signed an Airport Development Agreement (ADA) and entered into a 30-year contract for the development and operation of the Athens International Airport (AIA), a new airport at Spata, a town about 33 km to the northeast of Athens. The airport replaced the previous congested Hellenikon Airport. The concession was initiated in 1996, following the establishment of Athens International Airport (AIA), as special-purpose Company owned by the Greek Government and private investors. The state-of-the-art airport has been serving the Greek capital since it started commercial operations in March 28th, 2001 following a construction time of 51 months. The project is acclaimed as the first successfully completed PPP structure for a greenfield European airport. Total investment costs of the AIA were approximately EUR 2.25 billion.

BUSINESS	CONSTRUCTION OBLIGATIONS	PRIVATE FUNDING	SERVICE DELIVERY	SOURCE OF REVENUE
New	Build	Finance	Bulk	Fee
Existing	Refurbish		User	Tariffs

BUSINESS – Existing: The project involves the construction of a new airport at Spata, a town about 30 km to the northeast of Athens to replace the previous congested Hellenikon Airport. However, the project company is taking over an existing and known business with tested demand, previous financial data including revenue streams, operational costs and liabilities, as well as Hellenikon’s existing employees and contractual obligations.

CONSTRUCTION OBLIGATIONS – Build: The project involves the construction of a new airport facility with its associated construction risks including, design risks, cost overruns, completion delays which could significantly impact the project company’s cash flow, its ability to repay debt and the overall project’s outcome.

PRIVATE FUNDING – Finance: The project financing includes equity contribution from sponsors as well as a substantial portion of debt (50%) provided by the European Investment Bank. The project therefore is classified as Finance under the categorization model.

SERVICE DELIVERY – User: Airport services are delivered directly to users. Operational and traffic risks of the project was almost fully allocated to the project company, without a minimum level of traffic guaranteed in the contract. The state-owned flag carrier (Olympic) represents about 60% of the airport traffic which poses a significant risk for the project company due to the fragile financial condition of the airline.

SOURCE OF REVENUE – Tariffs: Operational and traffic risks of the project was almost fully allocated to the project company, without a minimum level of traffic guaranteed in the contract. Revenues from the project are derived directly

from users (passengers and airlines). The state- owned flag carrier (Olympic) represents about 60% of the airport traffic which poses a significant risk for the project company due to the fragile financial condition of the airline. Non-airside commercial activities of the airport (duty free zone, parking, restaurants, business center etc) account for about 20% of the total revenues of the project company.

7.7 THE ROYAL VICTORIA INFIRMARY AND FREEMAN HOSPITAL, UK

In the spring of 2003, a consortium led by Equion won preferred bidder status for the development of the Freeman Hospital and Royal Victoria Infirmary in Newcastle. The Royal Victoria Infirmary and Freeman Hospital is a typical example of a successful Private Finance Initiative (PFI) in the UK’s health sector which has been a key innovation in public sector management in the United Kingdom. Under the PFI scheme, the private concessionaire, Healthcare Support (Newcastle) Finance, will provide the designing and construction of facilities, non-clinical services and maintenance required over a term of 38 years (8-year construction period plus a 30-year operation period); a fixed unitary payment will be paid by the Newcastle-upon-Tyne Hospital NHS Trust (grantor) to the concessionaire in exchange for the services throughout the concession term.

BUSINESS	CONSTRUCTION OBLIGATIONS	PRIVATE FUNDING	SERVICE DELIVERY	SOURCE OF REVENUE
New	Build	Finance	Bulk	Fee
Existing	Refurbish		User	Tariffs

BUSINESS – New: The project involves a combination of building new facilities and refurbishing existing ones. However, the refurbishment area corresponds only to 6,700 (8%) squared meters compared to 76,300 (92%) square meters of new construction.

CONSTRUCTION OBLIGATIONS – *Build:* Capital expenditure requirements for the project are in their majority focused on the construction of new buildings/facilities. The transaction implies significant construction risks including cost overruns and completion delays which may affect the project’s profitability.

PRIVATE FUNDING – *Finance:* The project uses a significant contribution from the consortium in the form of equity and a substantial debt portion (debt equity ratio is 92:8). There are diverse sources of financing including a bond issue by Royal Bank of Canada and EIB loan guaranteed by XL Capital Assurance.

SERVICE DELIVERY – *Bulk:* Healthcare Support (Newcastle) Finance, the project operator, is responsible for delivering services directly to the Trust (grantor). There are no customer service responsibilities or any specific social risks for the operator.

SOURCE OF REVENUE – *Fee:* The revenue stream for the project originates exclusively from the grantor (Newcastle-upon-Tyne Hospital NHS Trust) under a fixed-price unitary payment to the project company in exchange for the services provided throughout the concession term.

7.8 TANESCO- NETGROUP SOLUTIONS

In 2002, the Government of Tanzania entered into a two-year contract with NETGroup Solutions (Pty) Ltd. of South Africa for the management of the Tanzania Electric Supply Company Limited (TANESCO), the country’s national utility company. The contract focused on improving the financial and operational efficiency of TANESCO and preparing the utility for subsequent privatization at end of contract term. A very successful with first phase of the contract focused on billing and collection ended in May 2004 and was subsequently renewed by the government for another of two and a half years. In total, the contract spanned 56 months from May 2002 to December 2006, including an initial phase of 27 months. Total contract payments for the two phases were estimated between US\$ 18 and 19 million.

Following the expiration of second phase in December 2006, the Government decided not to renew the management contract but to continue with full public ownership of TANESCO. Although privatization was not achieved, the contract was successful in improving TANESCO’s financial and administrative commercial technical performance. This categorization relates to the first phase contract

BUSINESS	CONSTRUCTION OBLIGATIONS	PRIVATE FUNDING	SERVICE DELIVERY	SOURCE OF REVENUE
New	Build	Finance	Bulk	Fee
Existing	Refurbish		User	Tariffs

BUSINESS – Existing: The project involves management of an existing utility (TANESCO) by the project company (NETGroup Solutions). The contract therefore implies taking over the utility’s customer base, previous undertakings, employees, and particularly in this case, TANESCO debt burden and fragile financial standing.

CONSTRUCTION OBLIGATIONS – N/A

PRIVATE FUNDING – N/A

SERVICE DELIVERY – User: The project company assumes collection and billing obligations, interfacing directly with customers.

SOURCE OF REVENUE – Fee: The project’s revenue stream originates from a performance based fee from TANESCO.

7.9 AGUAS DE CARTAGENA PUBLIC -PRIVATE PARTNERSHIP, COLOMBIA

In 1995, a public-private partnership with mixed-ownership was set up to provide water supply and sanitation to Cartagena de Indias, a city of almost 900,000 people on the northern coast of Colombia, which serves as the capital of one of the country’s departments (states), an economic hub and a popular tourist destination. The new mixed enterprise under the name of Aguas de Cartagena or AGUACAR, combined the resources of the public works department and Aguas de Barcelona, a Spanish water firm. Under a long term contract (26 years) AGUACAR assumed responsibility for O&M and partial investment; assets remained under the Municipality’s ownership. Total financing cost of works was estimated at US\$ 236 million (67% provided by AGUACAR and 33% by the Municipality / State).

Prior to 1995, water/wastewater service was operated by the Public Municipal Utility EPD. The utility was extremely unreliable and plagued with chronic inefficiency, excessive political interference, poor maintenance, poor service delivery weak commercial and financial management. Less than 70 percent of the city’s households had water connections and less than 55 percent had sewage service. Between 1996 and 2006, following AGUACAR’s management water supply coverage increased from 74% to almost universal coverage and sewer coverage went up from 62 to 79 %. Cartagena achieved this expansion of coverage despite a jump in its population during that period with the arrival of poor rural migrants.

One of the key considerations is the mixed-ownership of the company which was able to achieve almost universal access to piped water despite the massive arrival of poor rural migrants in the city, end acute water rationing in the city, and the ability to turn a bankrupt utility into a model water company. The AGUACAR PPP is also an example of the pragmatic and gradual approach with extensive use of community bulk-supply scheme that allowed serving illegal migrants from the outset, while individual connections were installed gradually as settlements became legalized.

BUSINESS	CONSTRUCTION OBLIGATIONS	PRIVATE FUNDING	SERVICE DELIVERY	SOURCE OF REVENUE
New	Build	Finance	Bulk	Fee
Existing	Refurbish		User	Tariffs

BUSINESS – Existing: The transaction entailed a public-private partnership with mixed-ownership set up to provide water supply and sanitation to the city of Cartagena in response to an unsustainable crisis due to the highly inefficient local utility (EDP) which was liquidated and existing services fully transferred to the new company AGUACAR.

CONSTRUCTION OBLIGATIONS – Refurbish: Under the contract AGUACAR assumed the responsibility of improving and expanding the quality of the service. In particular AGUACAR modernized the existing infrastructure for water and sewage and introduced automated control of processes and operations. However, assets remained the property of the municipality.

PRIVATE FUNDING – Finance: The transaction required upfront investment commitments of more than US\$ 230 million to improve water service, to increase quality and coverage.

SERVICE DELIVERY – User: The project company assumed billing and collection, as well as customer service.

SOURCE OF REVENUE – Tariffs: Project revenues derived from existing customers. The company assumed billing and collection, as well as customer service.

7.10 THE SOUTHERN AFRICA REGIONAL GAS PROJECT

The Southern Africa Regional Gas Project is the first large scale energy project to capitalize on Mozambique’s rich natural gas resources, which were first discovered in 1956. It consists of an “upstream project”, which includes the development of the Pande and Temane gas fields in Mozambique and the construction of a central processing facility, and a “downstream project”, which includes the construction, operation and maintenance of an 865km pipeline to transport the gas to Sasol’s Secunda plant in South Africa, with a capital expenditure of approximately \$1bn.

Sasol Limited is the primary sponsor of the Project from gas field development in Mozambique to the end user sales in South Africa. It provides full debt service support to the two project companies (SPT and ROMPCO) through ship or pay arrangements and therefore assumes all project related commercial risks as well as a portion of Mozambique political risks. The Mozambique political risk coverage is primarily provided by the Export Credit Insurance Corporation of South Africa (ECIC), MIGA – partially reinsured by SACE of Italy and EFIC of Australia, the World Bank through a Partial Risk Guarantee (PRG), and the European Investment Bank (EIB).

The Southern Africa Regional Gas Project is an example of a successful cross-border transaction despite its complexity in the design and implementation process

and highly diverse stakeholder groups. The transaction was key to introduce international banks to Mozambique and raise the country’s profile and set high standards for the government. The project is also an example of World Bank Group coordination and cooperation involving two IBRD partial risk guarantees (denominated in South African Rand), a MIGA guarantee and IFC equity support.

BUSINESS	CONSTRUCTION OBLIGATIONS	PRIVATE FUNDING	SERVICE DELIVERY	SOURCE OF REVENUE
New	Build	Finance	Bulk	Fee
Existing	Refurbish		User	Tariffs

BUSINESS - *New*: Under the model the project is classified as “new business” as the project involves the construction of the two individual and integrated sub-projects, that is, the development of the Pande and Temane gas fields in Mozambique and the construction of a central processing facility (called *upstream project*), and, the construction of the pipeline to transport the gas to Sasol’s Secunda plant in South Africa (called “downstream or pipeline project”). There is no previous record of demand data, revenue stream or contractual obligations or customer base.

CONSTRUCTION OBLIGATIONS – *Build*: The project company undertakes the development and construction of new assets (gas fields, processing facilities and the actual pipeline) on a Greenfield basis. Being a large and complex cross-border transaction involving a full spectrum of stakeholders and several groups in both Mozambique and South Africa made SASOL a project riskier from the construction perspective due to potential engineering and geological problems, cost overruns and delays.

PRIVATE FUNDING – *Finance*: The two individual and integrated sub-projects required upfront financing from sponsors and large commercial debt facilities, which were partially covered by the World Bank, MIGA and ECAs.

SERVICE DELIVERY – Bulk: The gas is transported to South Africa by project sponsor Sasol through a 865 km pipeline from the Temane and Pande gas reserves in Mozambique.

SOURCE OF REVENUE – Fee: Project revenues are obtained from the purchase of natural gas from the pipeline by Sasol in South Africa. The gas is transported by project sponsor Sasol through a 865 km pipeline from the Temane and Pande gas reserves in Mozambique.

7.11 SAO PAULO METRO LINE 4, BRAZIL

The new Metro Line 4 will be a principal commuter route that runs southwest to northeast through metropolitan São Paulo, connecting residential neighborhoods to important commercial districts adding approximately 21 percent in additional capacity to the metro system across low, medium and higher income populations.

The project includes two main contracts: (a) a turnkey contract for the provision of civil works and electrification for the 12.8 km of metro line¹⁴ and (b) a concession to operate the system for 30 years, in exchange for the provision of the rolling stock and systems, financed mainly by the private sector and the State. This case study analysis focuses on the latter PPP project component.

Total project costs are estimated at US\$ 398.55 million with about US\$ 82.95 million equity contribution from sponsors (21%). Total debt of US\$ 315.60 (79%) is split in two tranches, a \$69.2 million, 15-year A loan from the IADB, and a \$240 million, 12-year B loan, and led by IADB, from Banco Santander, SMBC, KfW, Banco Espirito Santo, BBVA as lead arrangers and Société Générale and WestLB as co-lead arrangers. The project was not eligible for support from the Brazilian government's development bank, BNDES, because the trains for the project were manufactured outside of the country.

The Project was awarded in November 2006 to a consortium (Via Quatro)¹⁵ led by Companhia de Concessões Rodoviárias (CCR) pursuant to an international public

¹⁴ This component is finance by the World Bank, JOBIC and State of Sao Paulo

¹⁵ The consortium (and sponsors) consists of CCR (58%), Mitsui (10%), Montgomery Participações S.A. of Portugal (30%), Benito Roggio Transportes S.A. of Argentina (1%), and RATP Développement S.A of France (1%)

bidding process with the Government of the State of Sao Paulo. This was a landmark event, and the first PPP signed by any public sector agency in Brazil since the passage of the new Brazil's PPP legislation in 2004. Under the terms of the PPP contract, operator ViaQuatro will be responsible for the provision of rolling stock, trains and technical equipment, and the operation and maintenance of a 12.8 km metro line (Metro Line 4) in Sao Paulo during a 30-year concession term. The state of São Paulo's government, under its civil works authority, is responsible for the construction of the required civil infrastructure works which includes various stations, tunnels and railways. The state performs such civil works before turning over the supply, operation and maintenance to ViaQuatro.

The concession was awarded on the basis of a low bid for required availability payments; it also benefits from a minimum revenue guarantee and revenue-sharing threshold, protecting the concessionaire from low revenues, but providing the state with revenue sharing if use is higher than projections. Most of the consortium's income will come from passenger tariffs, but should this fall below the projected levels the government must top it up. However, if income is greater than expected the consortium must share the proceeds with the state.

BUSINESS	CONSTRUCTION OBLIGATIONS	PRIVATE FUNDING	SERVICE DELIVERY	SOURCE OF REVENUE
New	Build	Finance	Bulk	Fee
Existing	Refurbish		User	Tariffs

BUSINESS – New: The project involves the construction of a new line for the current metro system in Sao Paulo. The demand for the metro is known, traffic on the new line is unknown. The project company is responsible only for this new line.

CONSTRUCTION OBLIGATION – N/A

PRIVATE FUNDING – Finance: The project financing includes equity contribution from sponsors of about US\$ 83 million (21%). There is also a substantial portion of debt in the form of an A loan from IADB and a B loan, led by IADB, from several commercial banks. The project therefore is classified as Finance.

SERVICE DELIVERY – User: Project operator will deliver service directly to the metro’s customers; it is also responsible for collection and billing obligations as well as customer service.

SOURCE OF REVENUES – Tariffs: Most of the consortium’s income will come from passenger tariffs, with a minimum revenue guarantee and revenue-sharing threshold, protecting the concessionaire from low revenues, but providing the state with revenue sharing if use is higher than projections.

7.12 SKIKDA SEAWATER DESALINATION PLANT, ALGERIA

In an effort to address the severe shortage of fresh water due to increasing demand, drought, and pollution, the Government of Algeria decided to embark on an ambitious plan to construct up to 28 large-scale desalination plants along the 1,300 km coastline of Algeria before year 2020. The Skikda Desalination Plant, one of the projects under the plan, is located in the northern part of Algeria (Mediterranean Sea) about 2 km east of the city of Skikda (about 500 km east of the city of Algiers). The project consists of a seawater desalination plant producing 100,000 cubic meters of water a day using reverse osmosis (RO), provide potable water needs of 700,000 equivalent inhabitants and petrochemical industries nearby.

The total cost of the project was estimated at US\$ 110.6 million (80% debt, 20% equity). The project was financed by a local government-financed bank, the Banque Nationale d’Algerie (BNA) which provided the Spanish consortium with a 17-year term loan in local currency at a very favorable fixed rate. The terms of the nonrecourse long-term funding by the BNA, allowed the project to eliminate foreign exchange rate risk and permitted it to achieve a ratio of debt to equity of 80:20. The Algerian Energy Company (AEC) participated 40% in the equity.

The Algerian Energy Company (AEC) awarded the project in April 2004 to Spanish GEIDA Consortium¹⁶ for a 25-year contract. The water produced is to be sold on a fixed plus variable tariff scheme as stipulated under a water purchase agreement with Sonatrach and Algérienne des Eaux (Algerian government-owned companies for exploitation and management of hydrocarbon and water management respectively).

BUSINESS	CONSTRUCTION OBLIGATIONS	PRIVATE FUNDING	SERVICE DELIVERY	SOURCE OF REVENUE
New	Build	Finance	Bulk	Fee
Existing	Refurbish		User	Tariffs

BUSINESS – *New*: The project involves the construction of a new desalination plant on green field basis. There are no previous data, employees, or undertakings requiring due diligence by investors.

CONSTRUCTION OBLIGATION – *Build*: The transaction implies significant construction risks for Aguas de Skikda, including cost overruns and completion delays which may affect the project’s profitability. These risks are however, well mitigated considering the experience and reputation of the company and sponsors in project of this nature.

PRIVATE FUNDING – *Finance*: The project is financed through a combination of equity from sponsors and financing from BNA, a local government-owned bank in Algeria.

SERVICE DELIVERY – *Bulk*: The project company is required to deliver services directly to project off takers ADE and Sonatrach.

¹⁶ The Geida Consortium is constituted by Abengoa’s Befesa and Codesa (50%); Actividades de Construcción y Servicios (25%) through Cobra-Tedagua; Sacyr (25%) through Sacyr.

SOURCE OF REVENUES – Fee: The source of the revenue stream originates directly from a fee under the Water Purchase Agreement.

7.13 ZAGREB-MACELJ TOLL ROAD, CROATIA

Privately financed rehabilitation and new construction of a 60 km long toll motorway section from the Croatian capital Zagreb to Macelj on the Slovenian border. The road is part of the Transeuropean road network and a key component in the Pyhrn corridor, which will create an unbroken link from Athens and Istanbul to Western Europe.

Construction lasted 35 months, from July 2004 through May 2007. The construction phases comprised widening of the existing motorway from Zagreb to Krapina from 2 to 4 lanes and the new construction of a 19.4 km long 4-lane section from Krapina to Macelj, including

- Total length of the 15 main bridges: 5,000 m
- Total length of the 6 tunnels: 5,900 m

The project was undertaken by a Joint Venture between Strabag International GmbH and DYWIDAG International GmbH.

BUSINESS	CONSTRUCTION OBLIGATIONS	PRIVATE FUNDING	SERVICE DELIVERY	SOURCE OF REVENUE
New	Build	Finance	Bulk	Fee
Existing	Refurbish		User	Tariffs

BUSINESS – New: The project involves the construction of a new toll road on green field basis, with no hard data on traffic or other demand risk.

CONSTRUCTION OBLIGATION – Refurbish: The transaction implies significant construction risks for the refurbishment of existing road and construction of new road. The Government provides the land.

PRIVATE FUNDING – Finance: The project is financed through a combination of equity from sponsors and financing from commercial lenders.

SERVICE DELIVERY – Users: The project company provides access to the road to users directly.

SOURCE OF REVENUES – Tariff: The project company charges tolls to users.

7.14 PANAGARH TO PALSIT TOLLROAD, INDIA

The Rs 400-crore (over \$90 million) project involves strengthening of the existing two lanes and constructing two more lanes on the 64-km-long stretch between Panagarh and Palsit on NH-2 in West Bengal, it forms a part of Delhi - Kolkatta section of Golden Quadrilateral.

Malaysia's Gamuda-WCT won the project through competitive tender from the National Highways Authority of India (NHAI) on an annuity basis. In all 10 entities bid for this project, including L&T, HCC, GMR Group, Jaiprakash Industries, IRCON and Punj Lloyd.

The concession period of 17 years and 4 months commences seven months from the date of the Concession Agreement. Construction must be completed within 28 months. Thereafter, the consortium, which will form an SPV for this purpose, will maintain the highway for the remainder of the concession period. As per the agreement, NHAI will pay 30 fixed semi-annual payments of Rs 39.99 crore.

BUSINESS	CONSTRUCTION OBLIGATIONS	PRIVATE FUNDING	SERVICE DELIVERY	SOURCE OF REVENUE
New	Build	Finance	Bulk	Fee
Existing	Refurbish		User	Tariffs

BUSINESS – New: The project involves a new road.

CONSTRUCTION OBLIGATION – Refurbish: The project company is responsible for the construction and refurbishment of the road.

PRIVATE FUNDING – Finance: The project is financed through a combination of equity from sponsors and commercial financing.

SERVICE DELIVERY – User: The project company provides access to the road to individual users.

SOURCE OF REVENUES – Fee: The project company revenues are derived from performance based fees paid by the Government.

7.15 ORLOVSKI TUNNEL CONCESSION, RUSSIA

The Orlovski tunnel will connect the centre of the city of Saint Petersburg with its northeast section. It crosses the Nēva River at the historic location of Smolny. It is anticipated that approximately 60,000 vehicles will pass through it daily. The estimated investment costs are approximately 1.5 billion US Dollars. The bidding process is currently underway, with 4 international consortium having pre-qualified. The bidders must propose designs for three lanes in each direction, but the decision to use one or two tunnels, and using tunnel boring technology or submerged sections is left to the bidders. Bidders must provide a mixture of manual and electronic tolling.

The revenue for the project company will be based on an availability payment from the City, with performance penalties.

BUSINESS	CONSTRUCTION OBLIGATIONS	PRIVATE FUNDING	SERVICE DELIVERY	SOURCE OF REVENUE
New	Build	Finance	Bulk	Fee
Existing	Refurbish		User	Tariffs

BUSINESS – *New*: The project involves a new tunnel under the Neva River, in St. Petersburg.

CONSTRUCTION OBLIGATION – *Build*: The project company is responsible for the construction of a greenfield tunnel.

PRIVATE FUNDING – *Finance*: The project is financed through a combination of Government subsidy, equity from sponsors and commercial financing.

SERVICE DELIVERY – *User*: The project company provides access to the tunnel to individual users.

SOURCE OF REVENUES – *Fee*: The project company revenues are derived from performance based fees paid by the Government.