

E L S E V I E R F I N A N C E



public-private  
**partnerships**

Principles of Policy and Finance

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# What are Public–Private Partnerships?

## §1.1 INTRODUCTION

This chapter examines the reasons for private involvement in public infrastructure (§1.2), defines what is meant by a PPP (§1.3), and traces their historical development and current structures (§1.4). The place of PPPs in provision of public infrastructure is considered (§1.5), and the main types of PPP are summarised (§1.6).

## §1.2 PUBLIC INFRASTRUCTURE AND THE PRIVATE SECTOR

Public infrastructure can be defined as facilities which are necessary for the functioning of the economy and society. These are thus not an end in themselves, but a means of supporting a nation's economic and social activity, and include facilities which are ancillary to these functions, such as public-sector offices or accommodation. Broadly speaking, public infrastructure can be divided into:

- 'economic' infrastructure, such as transportation facilities and utility networks (for water, sewage, electricity, *etc.*), *i.e.* infrastructure considered essential for day-to-day economic activity; and
- 'social' infrastructure such as schools, hospitals, libraries, prisons, *etc.*, *i.e.* infrastructure considered essential for the structure of society.

A distinction can also be made between 'hard' infrastructure, whether economic or social, primarily involving provision of buildings or other physical facilities, and 'soft' infrastructure, involving the provision of services, either for economic infrastructure (*e.g.* street cleaning), or for social infrastructure (*e.g.* education and training, social services).

There is probably universal agreement that the state has to play a rôle in the provision of public infrastructure, on the grounds that:

- The private sector cannot take account of ‘externalities’—*i.e.* general economic and social benefits—and therefore public-sector intervention is required (*cf.* §5.2.1).
- Without such intervention infrastructure which has to be freely available to all (‘public goods’) will not be built, especially where this involves networks, such as roads, or services, such as street lighting.
- Competitive provision of infrastructure may not be efficient, and a monopoly provision requires some form of public control.
- Even where competition is possible, the public sector should still provide ‘merit goods’, *i.e.* those that would otherwise be underprovided (such as schools, as the rich could pay for private schools but the poor would get no education).
- Infrastructure requires a high initial investment on which only a very long-term return can be expected. It may be difficult to raise private capital for this investment without some public-sector support.

It could thus be argued that infrastructure should be provided by the public sector where competitive market pricing would distort behaviour or lead to loss of socio-economic benefits. But history suggests that there are two ways for the state to do this—either by direct provision, or by facilitation of private-sector provision (whether through regulation, tax subsidy or similar incentives, or by contract). As discussed below, the use of private capital to fund economic infrastructure (*e.g.* for transportation) is of long standing. Equally, it was generally only during the 19th and 20th centuries that the state took over responsibility, mainly from religious or private charity, for the provision of much social infrastructure (*e.g.* for schools and hospitals). Indeed it may be said that private provision of a large proportion of public infrastructure was the historical norm until recently, but the definition of ‘necessary’ public infrastructure has clearly widened over the last couple of centuries. PPPs may therefore be considered a modern way of facilitating private provision to help meet an increased demand for public infrastructure.

## §1.3 PUBLIC–PRIVATE PARTNERSHIPS

### §1.3.1 MEANING

The term ‘public–private partnership’ appears to have originated in the United States, initially relating to joint public- and private-sector funding for educational programmes, and then in the 1950s to refer to similar funding for utilities (*cf.* §17.6.2), but came into wider use in the 1960s to refer to public–private joint ventures for urban renewal. It is also used in the United States to refer to publicly-funded provision of social services by non public-sector bodies, often from the voluntary (not-for-profit) sector, as well as public funding of private-sector research and development in fields such as technology. In the international-development field the term is used when referring to joint government, aid agency and private-sector initiatives to combat diseases such as AIDS and malaria, introduce improvements in farming

methods, or promote economic development generally. Most of these can be described as ‘policy-based’ or ‘programme-based’ PPPs.

However the subject of this book is what may be called ‘project-based’ or ‘contract-based’ PPPs, a more recent development. (Although some urban-renewal PPPs are also project-specific, they do not involve the same long-term relationship.) PPPs as defined here have the following key elements:

- a long-term contract (a ‘PPP Contract’) between a public-sector party and a private-sector party;
- for the design, construction, financing, and operation of public infrastructure (the ‘Facility’) by the private-sector party;
- with payments over the life of the PPP Contract to the private-sector party for the use of the Facility, made either by the public-sector party or by the general public as users of the Facility; and
- with the Facility remaining in public-sector ownership, or reverting to public-sector ownership at the end of the PPP Contract.

In some cases, a PPP Contract may involve major upgrading of existing infrastructure rather than a ‘greenfield’ construction. However private-sector acquisition or management of existing public infrastructure without any major new capital investment or upgrading is not considered to be a PPP as defined here. Similarly private-sector provision of soft infrastructure, which involves no significant investment in fixed assets (and hence no need for private-sector financing), falls into the category of ‘outsourcing’ rather than PPPs, although obviously the boundary is not precise as soft services are often associated with hard infrastructure (*cf.* §13.2). Nor is a PPP a simple joint-venture investment between the public and private sectors, unless this is also linked to a PPP Contract (*cf.* §17.5). Also this book does not deal in detail with smaller PPPs, usually at a municipal level, in sectors such as parking garages; this smaller end of the market follows the same general principles, but is obviously less elaborate in contract form and financing (*cf.* §8.5.3).

The public-sector party to a PPP Contract (the ‘Public Authority’—also known by a variety of other terms such as the ‘Public Entity’, ‘Public Party’, ‘Government Procuring Entity’, ‘Institution’, ‘Contracting Authority’ or just the ‘Authority’) may be a central-government department, a state or regional government, a local (municipal) authority, a public agency or any other entity which is public-sector controlled. The private-sector party is normally a special-purpose company (the ‘Project Company’—also known as the ‘Private Party’), created by private-sector investors specifically to undertake the PPP Contract. It should be noted that the relationship between these two parties is not a partnership in the legal sense, but is contractual, being based on the terms of the PPP Contract. ‘Partnership’ is largely a political slogan in this context (but *cf.* §6.6).

### §1.3.2 PPP v. PUBLIC-SECTOR PROCUREMENT

A PPP is thus an alternative to procurement of the Facility by the public sector (‘public-sector procurement’), using funding from tax revenues or public borrowing. In a typical public-sector procurement (known as ‘design-bid-build’), the Public Authority sets out the

specifications and design of the Facility, calls for bids on the basis of this detailed design, and pays for construction of the Facility by a private-sector contractor. The Public Authority has to fund the full cost of construction, including any cost overruns. Operation and maintenance of the Facility are entirely handled by the Public Authority, and the contractor takes no responsibility for the long-term performance of the Facility after the (relatively short) construction-warranty period has expired.

In a PPP, on the other hand, the Public Authority specifies its requirements in terms of ‘outputs’, which set out the public services which the Facility is intended to provide, but which do not specify how these are to be provided. It is then left to the private sector to design, finance, build and operate the Facility to meet these long-term output specifications. The Project Company receives payments (‘Service Fees’) over the life of the PPP Contract (perhaps 25 years on average) on a pre-agreed basis, which are intended to repay the financing costs and give a return to investors. The Service Fees are subject to deductions for failure to meet output specifications, and there is generally no extra allowance for cost overruns which occur during construction or in operation of the Facility.

The result of this PPP approach is that significant risks relating to:

- the costs of design and construction of the Facility, *and*
- market demand for the Facility (usage), *or*
- service provided by the Facility (including its availability for use), *and*
- the Facility’s operation and maintenance costs

are transferred from the Public Authority to the Project Company.

### §1.3.3 TERMINOLOGY

It should be mentioned that there are a number of alternative names for PPPs:

- Private Participation in Infrastructure (PPI), a term which seems to have been coined by the World Bank, and perhaps expresses more clearly the subject of this book; however it is little used outside the development-financing sector, except for the South Korean PPI programme;
- Private-Sector Participation (PSP), also used in the development-banking sector (however neither PPI or PSP are limited to the definition of PPPs above);
- P3, used in North America;
- Privately-Financed Projects (PFP), used in Australia;
- P-P Partnership (to avoid confusion with PPP meaning ‘purchasing power parity’, a method of comparing currency exchange rates to reflect the real costs of goods and services in different countries);
- Private Finance Initiative (PFI), a term originating in Britain, and now also used in Japan and Malaysia.

## §1.4 DEVELOPMENT AND STRUCTURES

There are a number of different approaches to the introduction of private financing into provision of public services. Concessions have a long history (§1.4.1). Power Purchase

Agreements (§1.4.2), provided the modern contractual and financing framework for PPPs (§1.4.3)—both for Concessions (§1.4.4) and the more recent PFI Model (§1.4.5).

### §1.4.1 CONCESSIONS AND FRANCHISES

Although the term PPP is a new one, the concept of using private capital to provide public facilities is very old. In 18th- and early 19th-century Britain groups of local magnates formed turnpike trusts which borrowed money from private investors to repair the roads, and repaid this debt by charging tolls. Most of London's bridges were also financed by similar bridge trusts until the mid-19th century, and similarly in the late 19th century the Brooklyn Bridge in New York was built with private-sector capital. In France, the construction of canals with private-sector capital began in the 17th century.

This type of PPP is known as a Concession: that is, a 'user pays' model in which a private-sector party (the Concessionaire) is allowed to charge the general public Service Fees for using the Facility—for example the payment of a toll for using a bridge, tunnel or road. The toll reimburses the Concessionaire for the cost of building and operating the Facility, which usually reverts to public-sector control at the end of the Concession period. Apart from roads and related facilities, Concessions were used in many countries in the 19th and early 20th centuries to construct facilities such as railways, water supply and waste-water treatment networks.

The rôle of the public sector in Concessions is to establish the framework under which the Concessionaire operates, usually under a general Concession Law or legislation specific to the particular Concession, to choose a Concessionaire, and to regulate the detailed requirements for the construction and operation of the Facility, usually through a Concession Agreement signed between the Public Authority and the Concessionaire.

A further development of Concessions is the Franchise, or to use the less-ambiguous French term, *Affermage*. A Franchise is the right to exploit an already constructed Facility, *i.e.* it is similar to a Concession but without the initial construction phase. The Franchisee (equivalent to a Concessionaire) may make a lump-sum payment to the Public Authority in return for this right. A Franchise is not considered to be a PPP as previously defined, because it does not involve the provision or upgrade of infrastructure, but only its operation. However the contractual and financial basis is similar in some respects (and hence is covered in this book). 'Farming', in its older English meaning (*e.g.* 'tax farming') means the same as the French term but has largely gone out of use in this sense. 'Lease' is also used, but this is misleading given its other meanings. In European Union terminology a Franchise is known as a 'service concession', while a Concession as defined in this book—*i.e.* involving the construction of new infrastructure—is known as a 'works concession'.

Although the use of Concessions for constructing new infrastructure faded away in many countries after the 19th century, as the rôle of the state expanded, Franchises continued to be important, *e.g.* in the French water sector. The disuse of Concessions only began to reverse at the end of the 20th century, as interest started to grow in this and other types of PPP as an alternative funding model, as discussed below. (And similarly Franchises have been revived, *e.g.* in the British rail sector.)

## §1.4.2 POWER PURCHASE AGREEMENTS

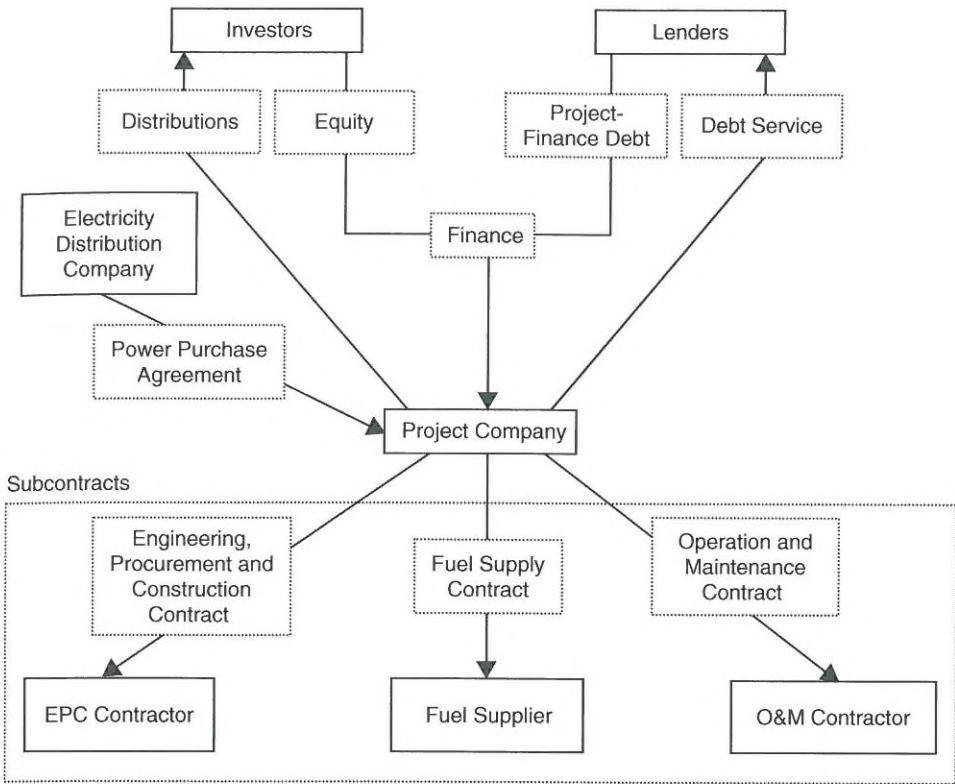
The Power Purchase Agreement (PPA), developed in the United States in the 1980s, provided the template for modern PPP Contracts. (PPAs and similar process-plant offtake contracts are discussed in detail in Chapter 6 of *Principles of Project Finance*.) PPAs began after the 1978 Private Utility Regulatory Policies Act (PURPA), which encouraged the construction of cogeneration plants, whose electricity could be sold to the regulated power utilities. PPAs arrived in Europe in the early 1990s, with the privatisation of the British electricity industry; this encouraged a separation between private-sector companies involved in power generation and those involved in distribution, and the development of independent power projects to increase competition in power generation. Under a PPA, the investors are paid a ‘Tariff’ split between:

- an *Availability Charge* (also known as a Capacity Charge) for making their power station available to provide power to the utility: this covers the capital expenditure involved in building the power station and its fixed operating expenditure; and
- a *Usage Charge* (also known as a Variable Charge) for the marginal cost of generating power as and when required by the electricity utility: this mainly covers the cost of the fuel used to generate the electricity (e.g. coal or natural gas).

A key aspect of a PPA is therefore that the investors in the Project Company which builds and operates the power station do not take any risk on whether the electricity which it has the capacity to generate is actually needed: that risk remains with the utility, who pays the Availability Charge whether it uses any power or not. The Project Company is, however, responsible for the operating performance of the power station, and if for any reason it is not capable of generating the level of power committed the Availability Charge will be reduced accordingly. Thus these investors do not take usage risk, but only the risk of completing the power station to time and to budget, and thereafter operating or performance risk—unlike a Concessionaire, who is only paid if people use the Facility.

The other vital factor which enabled the PPA contract model to be developed was the financing technique known as ‘project finance’, which provides the high ratio of long-term debt financing required for such projects. Although such techniques had existed previously in the natural-resources sector, the project-finance structures used to fund PPAs have provided the basis for funding all types of PPPs (*cf.* Chapter 8). An important aspect of project finance is the passing of the risks mentioned above from the Project Company to Subcontractors. Figure 1.1 shows how this risk transfer fits within the main building blocks for a power-generation project. (The arrows show the direction of cash flows.) The main components in the structure are:

- a Project Company, owned by private-sector investors;
- financing for the project’s capital costs through shareholder equity and project-finance debt;
- an Engineering, Procurement and Construction (‘EPC’) Contract, under which the Contractor agrees to deliver a completed and fully-equipped (‘turnkey’) power station to the required specification, at a fixed price and schedule;
- a fuel-supply contract, under which, say, coal or natural gas is provided to fuel the power station’s turbines;



**Figure 1.1** Project Finance for a Power Purchase Agreement (PPA)

- an operation and maintenance ('O&M') contract, under which an O&M contractor agrees to operate and maintain the plant on behalf of the Project Company;
- a PPA with an electricity-distribution company, with payments based on Availability and Usage Charges as discussed above;
- surplus cash flow after payment of fuel and operating costs is used, firstly, for payments of loan principal and interest ('debt service') to the lenders, and then to give a return on investment to the investors ('Distributions').

The Subcontractors have thus taken over many of the key risks, *e.g.* as to the outturn capital cost of the power station and its operating costs (other than fuel costs).

### §1.4.3 BOO—BOT—BTO—DBFO

The PPA as first developed was a 'Build-Own-Operate' (BOO) contract between private-sector parties, whereby the ownership of the power station remains with its investors, but it soon became apparent that a similar structure could be used for developing public-sector projects. The concept of the 'Build-Operate-Transfer' (BOT) contract was first developed in



Turkey; this was also intended for power generation, but with the key differences that the off-taker (purchaser) of the power would be a Public Authority, the state power utility, and that at the end of the contract ownership of the power station could pass from its investors to the off-taker (usually for a nominal or no cost) and hence to the public sector.

It was but a short step from the BOT Model to the ‘Build-Transfer-Operate’ (BTO) contract, where ownership is transferred to the Public Authority on completion of construction, and the ‘Design-Build-Finance-Operate’ (DBFO) contract, under which legal ownership of the Facility remains with the Public Authority throughout the contract, with the private-sector interest in the project being based solely on the contractual rights to operate the Facility and receive revenues from the off-taker for doing so, rather than ownership of physical assets.

In developing countries BOT, BTO and DBFO contracts provided a means for cash-constrained state power utilities to fund investment in more efficient plant, without relinquishing control over either the generation of the power (since the off-taker decides when the power station is to be dispatched, *i.e.* brought into use to generate power), its delivery to the consumer, or its cost to the consumer—in other words, the private sector delivers the service on behalf of the public sector, but entirely under public-sector control.

#### §1.4.4 PROJECT FINANCE FOR CONCESSIONS

The modern use of project-financing techniques for Concessions, influenced by the BOT model, began with the successful financing of the Channel Tunnel project between Britain and France in 1987 (albeit in the event this was a financially-disastrous project), and the Dartford Bridge (across the Thames estuary) shortly thereafter. It has to be said that neither of these were ‘typical’ projects, but the lessons learned from them have been widely applied to financing Concessions since then, most commonly in toll-road projects.

Figure 1.2 shows the main contractual and financing building blocks for a road Concession. The resemblance to the ‘spider diagram’ above for the power project is evident, the most important difference being the source of revenues (from tolls). Here the key elements in the structure are:

- a Project Company, owned by private-sector investors;
- financing for the project’s capital costs (‘capex’) through shareholder equity and project-finance debt;
- a Design & Build, ‘D&B’ Contract, under which the contractor agrees to design and construct the completed road and related works (*e.g.* toll booths) to the required specification, at a fixed price and schedule;
- an operating contract, under which a toll operation company provides services such as manning the toll booths, minor repairs, accident management, *etc.*
- a maintenance contract, under which a maintenance company provides road-maintenance services;
- a Concession Agreement (a standard name for a this type of PPP Contract) with the Public Authority, which allows the collection of tolls from road users; it does not usually involve any payment by or to the Public Authority (but *cf.* §13.3.5, §13.3.6);
- cash flow after operating costs (‘opex’), *i.e.* mainly payments on the operating and maintenance contracts, being used, firstly, for debt service, and then to pay Distributions to the investors.

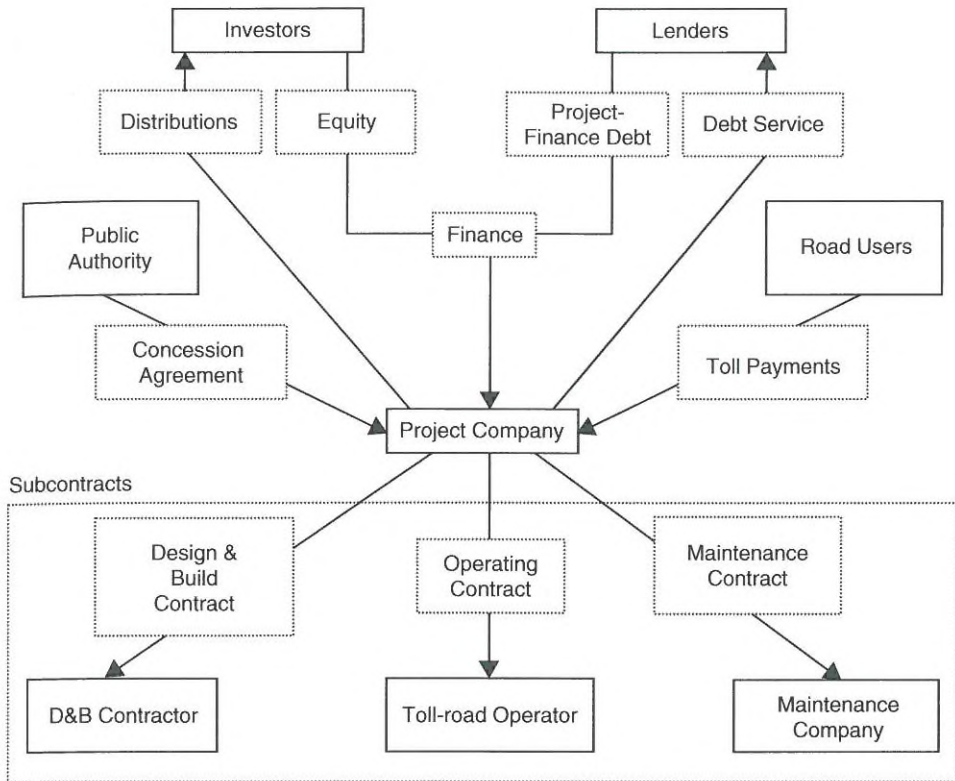
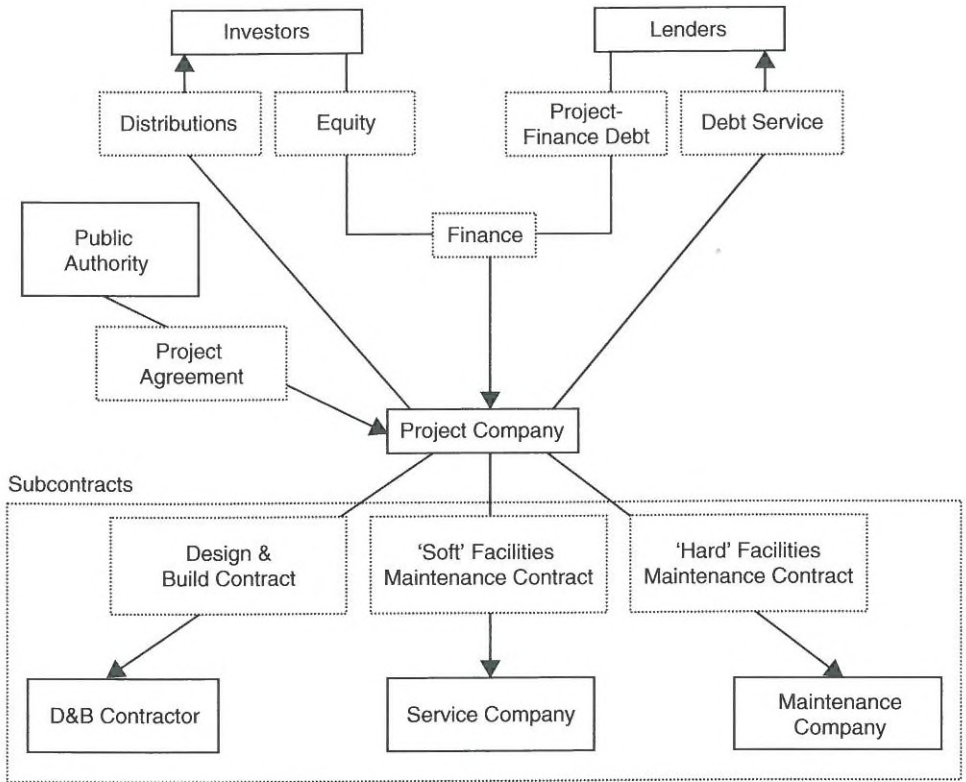


Figure 1.2 Project finance for a road Concession

### §1.4.5 THE PFI MODEL

In 1992 the British government announced the Private Finance Initiative (PFI), with the aim of bringing private finance into the provision of public infrastructure (*cf.* §3.4). This really began from the rediscovery of Concessions in the 1980s, mentioned above, and the first wave of projects, in 1994, involved construction and operation of new roads. But since the scope for toll roads in Britain was limited, instead of the ‘user pays’ principle of a Concession, this PFI Model (as we will term it) introduced the concept of payment by the Public Authority. Initially payments from the Public Authority were still based on usage by drivers, through so-called ‘Shadow Tolls’, *i.e.* a fixed schedule of payments by the Public Authority per driver/km (*cf.* §13.4.5).

The next stage in the development of the ‘full’ PFI Model was the use of PFI contracts for the provision of public facilities where usage risk inherently cannot be transferred to the private sector, such as schools and hospitals. In these cases the structure of the contract is still based on the PPA, in that the private-sector investor is paid by the Public Authority for ‘Availability’, *i.e.* constructing the Facility to the required specification and making it available for the period of the PFI contract, as well as for provision of services such as maintenance, cleaning and catering.



**Figure 1.3** Project finance for a PFI school project

Figure 1.3 shows the main building blocks for a school project on the PFI Model. The resemblance to a PPA is evident. Here the key elements in the structure are:

- a Project Company, owned by private-sector investors;
- financing of the project's capex through shareholder equity and project-finance debt;
- a D&B Contract, under which the contractor agrees to construct the school to the required specification, at fixed price and schedule;
- a 'Soft' Facilities Maintenance ('FM') Contract, under which a Service Company provides services such as security, cleaning and catering for the school;
- a 'Hard' FM Contract, under which a maintenance company (or the original D&B contractor) provides building-maintenance services;
- a Project Agreement (a standard name for a PFI-Model contract) with the Public Authority;
- cash flow after opex—mainly payments on the FM Contracts—is used, firstly, for debt service, and then to pay Distributions to the investors.

PPPs today are therefore based on the 'rediscovery' of Concessions and the development of the PFI Model. It should be noted that in some countries only the PFI Model is called a PPP, to distinguish it from a Concession. However in this book, 'PPP' will be used for the

general concepts covering both models, and ‘PPP Contract’ to refer both to a Concession Agreement and a Project Agreement.

## §1.5 PPPS AND PUBLIC INFRASTRUCTURE

Table 1.1 provides a summary of the different ways of providing public infrastructure discussed above, and shows how PPPs lie on the spectrum from wholly public-sector projects (and risk) to wholly private-sector projects. It is important to note that:

- Ownership of the Facility has little or nothing to do with which particular PPP model is applied, and hence the Concession or PFI Model can be used whether the contractual basis is DBFO, BTO or BOT (*cf.* §1.6).
- Terminology for the various types of contract is not used consistently, but the most common usage has been followed.
- Table 1.1 does not purport to show all possible structural variations, but does set out the most important models.

The same public infrastructure may be placed at different points on this spectrum in different countries. Water supply and waste-water services show the range of possibilities in this respect:

- public-sector ownership and operation: common in many countries;
- public-sector ownership and private-sector management: this is common in France, for example, in the water sector, where water services are managed under *Affermage* contracts—the Franchisee takes over facilities which are owned by the Public Authority under a long-term management contract (typically for 10–12 years);
- PFI Model: in Turkey and China, for example, BOT/BTO contracts, transferring risk and payment to the public sector (*i.e.* with payments by a Public Authority rather than end-users), have been used for the development of new water-services projects;
- Concessions: these have also become common, especially in developing countries; here the private-sector investors build a new system, collect tariff payments from users (prices may be regulated by the Public Authority or under the Concession Agreement itself), take the demand risk, and have to meet output specifications such as water quality and availability; at the end of the Concession the works revert to the public sector;
- Privatisation (BOO): in England the state-owned water boards have been converted into private-sector regional water companies, which own the water supply and sewage networks; the public-sector involvement is through a Water Services Regulator, which monitors the service provided, fixes maximum costs for water based on a reasonable rate of return on investment, and ensures a degree of competition in water supply; a similar system can be found in Chile.

So can it be said that one type of public infrastructure is inherently more suitable for a PPP than another? There is certainly some public infrastructure which it would be generally agreed cannot be privatised, such as roads, and for which PPPs (in either the Concession or PFI Models) are therefore the only way of bringing in private finance. For other infrastructure such as water there are clearly differing views on whether privatisation or the

Table 1.1  
Public and private provision of infrastructure

	Public project ←	Public-Private Partnership			→ Private project	
Contract Type	Public-sector procurement	Franchise ( <i>Affermage</i> )	Design-Build Finance-Operate (DBFO)*	Build-Transfer-Operate (BTO)**	Build-Operate-Transfer (BOT)***	Build-Own-Operate (BOO)
<b>Construction</b>	Public sector <sup>(2)</sup>	Public sector <sup>(2)</sup>	Private sector	Private sector	Private sector	Private sector
<b>Operation</b>	Public sector <sup>(3)</sup>	Private sector	Private sector	Private sector	Private sector	Private sector
<b>Ownership<sup>(1)</sup></b>	Public sector <sup>(4)</sup>	Public sector	Public sector	Private sector during construction, then public sector	Private sector during Contract, then public sector	Private sector
<b>Who pays?</b>	Public sector	Users	Public sector or users	Public sector or users	Public sector or users	Private-sector offtaker public sector <sup>(5)</sup> , or users
<b>Who is paid?</b>	n/a	Private sector	Private sector	Private sector	Private sector	Private sector

\* Also known as Design-Construct-Manage-Finance (DCMF) or Design-Build-Finance-Maintain (DBFM)

\*\* Also known as Build-Transfer-Lease (BTL), Build-Lease-Operate-Transfer (BLOT) or Build-Lease-Transfer (BLT)

\*\*\* Also known as Build-Own-Operate-Transfer (BOOT)

(1) In all cases, ownership may be in the form of a joint venture between the public and private sectors (*cf.* §17.5).

(2) Public sector normally designs the Facility and engages private-sector contractors to carry out construction on its behalf (design-bid-build).

(3) Public sector may enter into service (outsourcing) contracts (for operation and maintenance) with private-sector contractors.

(4) Ownership may be through an independent publicly-owned Project Company, *i.e.* a 'Public-Public Partnership' (*cf.* §17.2.2).

(5) The BOO Contract form applies to PPPs in the minority of cases where ownership of the Facility does not revert to the Public Authority at the end of the PPP Contract (*cf.* §15.11).

PPP approach is appropriate. In other cases, such as building mobile-phone networks, there is little disagreement in most countries that this is best done on the basis of licences to the private sector, *i.e.* on a privatised basis in a competitive market rather than *via* a PPP. There is probably an irreducible core of public-sector activity which has to be provided by the state without any delegation to the private sector—private armies were used in the Middle Ages but are unlikely to be found now (although the private sector may well provide PPP-based accommodation, equipment and services to the armed forces).

## §1.6 TYPES OF PPP

PPPs can be classified by the legal nature of private-sector involvement in the Facility, using expressions such as BOT, BTO, DBFO and variants on these as shown in Table 1.1, mainly reflecting the point at which legal ownership of the Facility is transferred from the Project Company to the Public Authority, or, if the Project Company is never the legal owner of the Facility, the nature of its legal interest, such as a property lease or merely a right to operate. Such distinctions are legal technicalities and do not affect the commercial and financial reality that PPP facilities are public-sector assets which cannot normally be sold off to the private sector (*cf.* §15.11).

It is more useful to classify PPPs based on the nature of the service and risk transfer inherent in the PPP Contract. On this basis PPPs can be split into two main categories—usage- and availability-based, the latter being split into three main sub-categories: accommodation, equipment, systems or networks, and process plant.

### §1.6.1 USAGE-BASED

As stated above, the Concession Model, with user-paid tolls, fares or usage fees for facilities such as roads, bridges, and tunnels, as well as other transportation facilities such as ports, airports, trams and light rail networks, is the prime example of a PPP where usage risk is transferred to the private sector, and probably still the most widely-applicable type of PPP. But usage risk can also be transferred under the PFI Model, for example through the payment of Shadow Tolls, as also mentioned above; here payment is by the Public Authority, but based on usage of the Facility by drivers. There can also be a mixture of the two approaches, whereby tolls or fares are paid by users, but with public-sector subsidies.

### §1.6.2 ACCOMMODATION

Accommodation-based projects are those such as hospitals, schools and prisons, where payment is generally made for making a building available for use by the Public Authority (typically in the social infrastructure field). These are the most important type of project using the PFI Model. They may also involve provision of long-term services such as cleaning, catering, maintenance, or even custodial services in a prison, as well as construction of a building, but this provision of services is secondary in importance to the construction of the building and its Availability to the Public Authority (*cf.* §13.5.2).

### §1.6.3 EQUIPMENT, SYSTEMS OR NETWORKS

Equipment, systems or network-based PPPs are less common, and are all based on the PFI Model. Payments by the Public Authority in such cases are also based on a form of Availability. Examples are DBFO road projects where, instead of payment being dependent on usage, it is dependent on the road being available, Availability being judged by measures such as whether any traffic lanes are closed, the speed at which traffic is able to move on the road, the rate at which accidents or spillages are cleared from the road, and so on. Similarly payment for rail projects can be made on the basis of how well the system (*e.g.* signalling or the train sets) works rather than the volume of passengers. Projects can also involve systems like street lighting or IT (information technology), and another important sector is that of defence equipment.

### §1.6.4 PROCESS PLANT

The original BOT model for power generation of course falls into this category, but (except in some parts of the Middle East) this is now quite uncommon as a PPP because of widespread privatisation of power generation and distribution. The most important types of PPP-related process plant are water and waste-water treatment plants, and waste incinerators. The key difference between these and other types of projects set out above is that they all involve a clearly-measurable process. As has already been discussed, water projects can be undertaken either under the Concession or the PFI Model, but in either case payments are primarily made for the ability to produce an end-product, treated water or waste water rather than on the actual volume processed or produced. Similarly in a waste-incineration project the Public Authority pays for the availability of a capacity to process waste, and if the plant cannot fulfil this requirement, payments will not be made. The principles in such projects are the same as those set out above for a PPA, but payments based on usage are comparatively less important; hence Availability is again the main criterion.