August 2016

An Overview of Public-Private Partnership (PPP) for Highway Management

Piyapong Jiwattanakulpaisarn, PhD
Policy Analysis Group, Bureau of Planning, Department of Highways

Why do we need transport infrastructure?

Road project development process

Policy and Strategy

Defining objective

Project Appraisal

Priority

Approval

Financing

Construction

Post Evaluation

Funding mechanisms for road infrastructure investment

- Taxation and traditional budget financing
  - Government budget, sourced from tax revenues, tolls, and public borrowing, is the most common financing instrument.
  - Contract out individual tasks – such as design, construction, maintenance
  - Tender out design and building as a single package (Design-Build contract)
- Public-Private Partnership (PPP)
  - An extensive package of responsibilities is transferred to a private sector over a long period of time, along with corresponding risks
  - Examples: concessions for existing or new facilities, management contracts
- Privatisation
  - government transferring complete ownership of the asset to private players

An Overview of Public-Private Partnership (PPP) for Highway Management

- What is PPP? and why undertake a PPP ?
- Types of PPP
- Typical PPP Structure
- Examples of PPPs in Infrastructure
- What does it take? PPP Process
- Summary

What is PPP? and Why undertake a PPP?

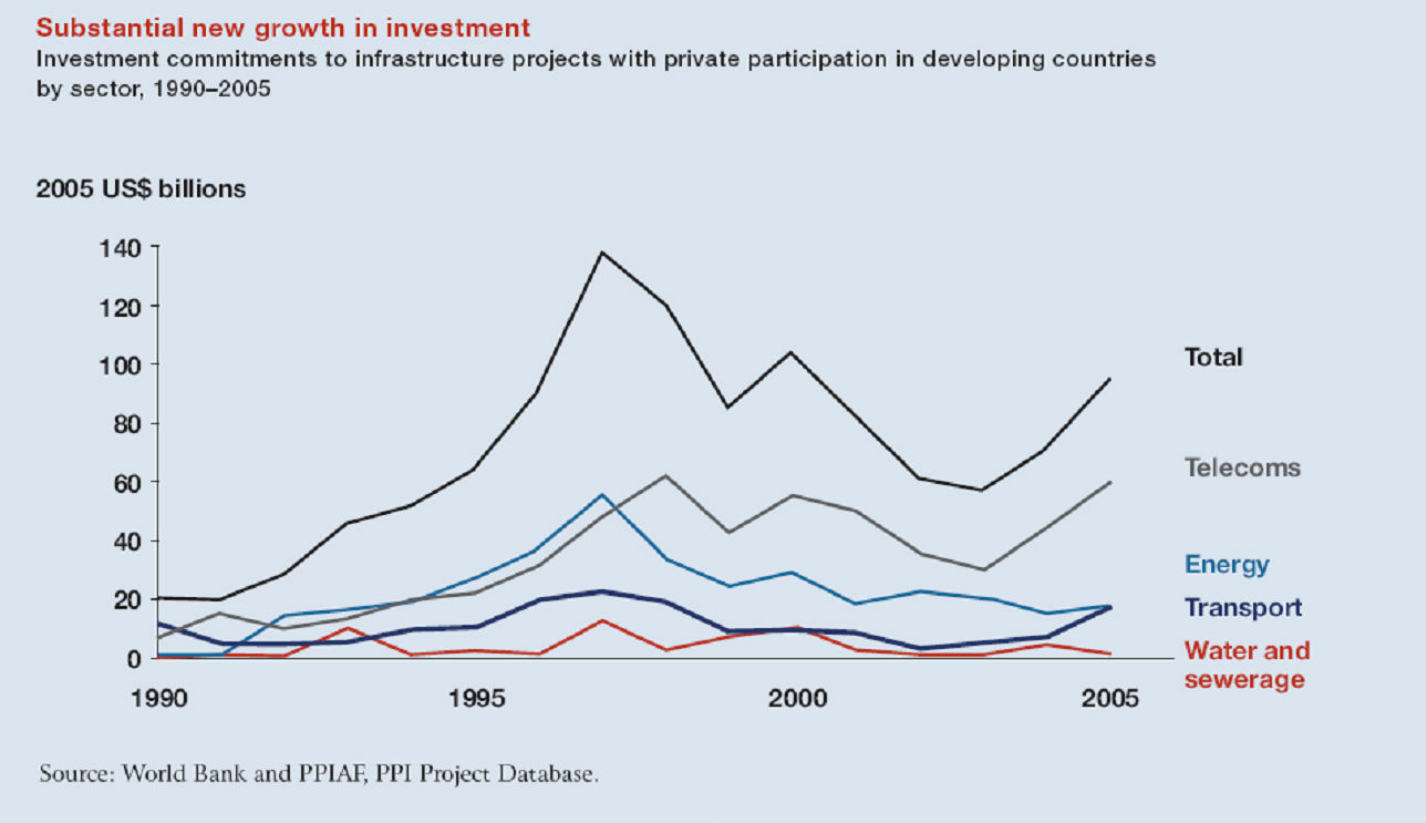
Public-Private Partnerships (PPP) for Highway Management: Overview

What is PPP? A definition

- Public-Private Partnership (PPP) can be generally defined as "an arrangement between government (or other public sector body) and a private sector party, resulting in the private sector providing infrastructure and/or services that are traditionally delivered by the public sector."

Role of PPPs internationally

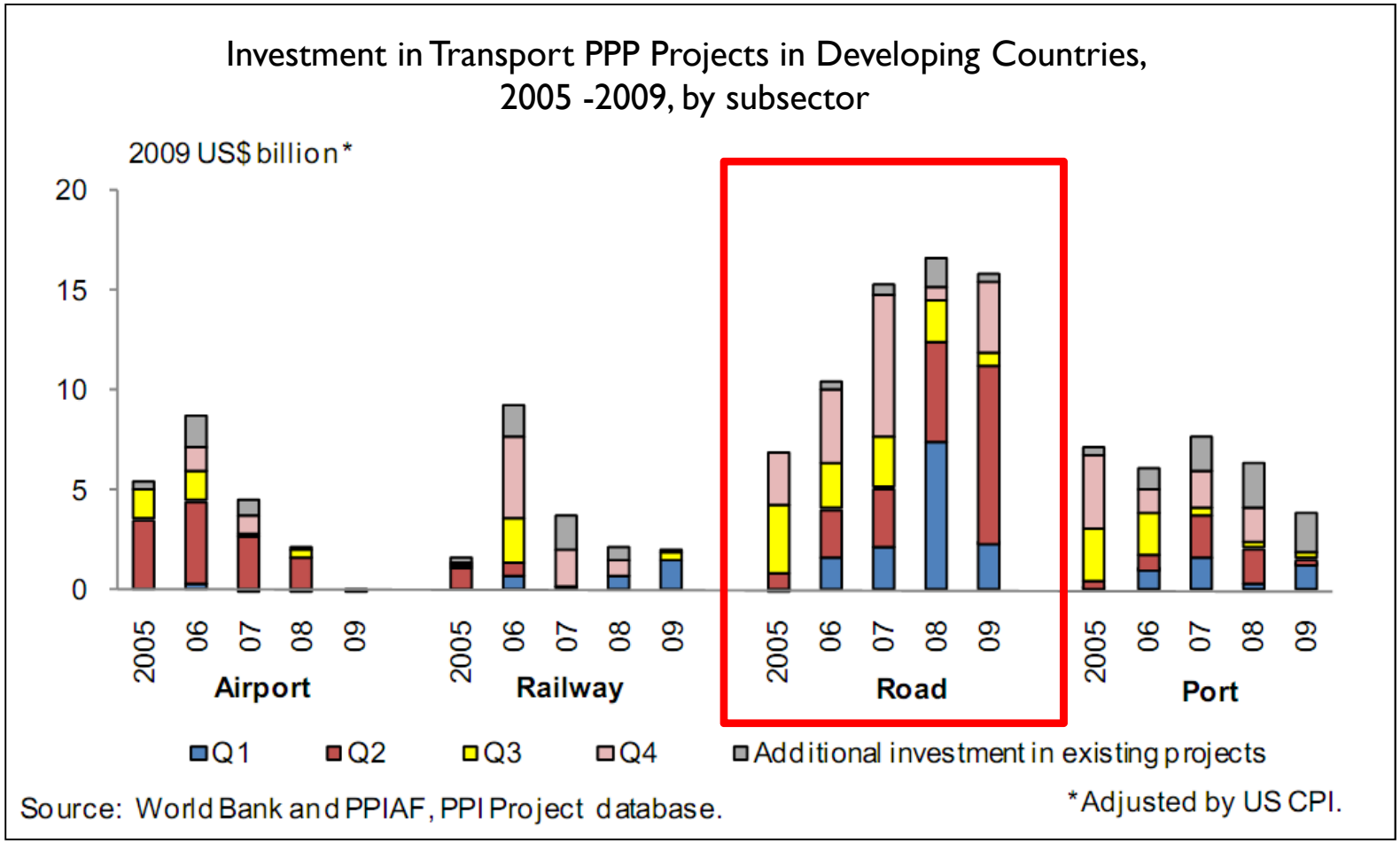
- Major global shift toward use of PPPs – seen in all regions: North America, Europe, Australasia, Middle East, Asia, Latin America, Africa



It is no longer a question of 'if PPPs'? but rather 'when and how PPPs'?

PPPs in Developing Countries

- Private participation concentrated in road investment projects



Key reasons for growing private sector involvement of infrastructure provision

1. **New source of investment for infrastructure (limited public budgets)**
   - PPP serves as additional resources available to meet the increasing needs of investment in infrastructure services
2. **More efficiency / effectiveness in services (poor public performance record)**
   - PPP can increase efficiency/effectiveness in project delivery and operation
   - Access to technical expertise, business/management skills, advanced technology
3. **Realize more value from public assets (value creation and capture)**
   - Exploiting the commercial potential of a project

Why undertake a PPP?
Traditional procurement vs. PPP

Overview of traditional infrastructure procurement

- Government designs and finances
- Contribution of private sector limited to construction
- Frequent construction cost overruns and delays
- Poor operation and maintenance of services by government
- Simple tendering based on cheapest price offered to do the job

Why undertake a PPP?
PPPs are fundamentally different

- **Long-term contract** between public and private sector – usually multiple years duration
- Entered through **competitive procurement** – not just price, but negotiated procurement
- Using **output specification** – government specifies "what", private sector defines "how"
- With suitable **risk allocation** between parties – risks with party best to manage
- Putting **private investment at risk**
- With **regulation or contract management of performance** of the private sector

Why undertake a PPP?
PPPs are fundamentally different

Example of publicly financed road project (Not PPP)

- Government designs a bridge connecting two islands
- Runs tender and gets cheapest construction company to build it
- Government pays for the construction from the budget
- When built, the government operates and maintains the bridge
- If anything goes wrong (after defects liability period), the government pays

Why undertake a PPP?
PPPs are fundamentally different

Example of Road PPP Project

- Government defines output = connection to serve 1,000 vehicles per day travel between islands
- Government tenders for best solution over 30 years – e.g. ferry, tunnel, bridge?
- After negotiated tender government enters 30-year contract with private company
- Private company designs, builds, finances bridge, then operates and maintains it for 30-years
- Private company receives payment if the bridge works and is available for traffic
- Government checks on safety and availability
- If the bridge is closed, or unsafe, the private company looses money

Why undertake a PPP?
Why can PPPs Deliver Better Value for Money?

- PPPs let Public Sector and Business do what they do Best!

Private	Public
• Innovation, use of technology • Professional management • Good project and lifecycle management • Efficiency • Technology • Maintenance practices • Financing	• Policy setting • National planning • Regulation • Looking after public interest

Understanding PPP
PPP Value Drivers

Less Value Added		More Value Added
Fixed price	**Performance-based payment mechanism**: carrots and sticks! Above-par performance should give higher profitability, low performance should trigger penalties.	*Performance payments*
Input contracting	**Output specifications:** Output-based contracting leaves room for the private sector to decide how to deliver the envisaged services. This uses the private sector's creativity to deliver the agreed public service at lower costs, or to provide better quality at the same cost to the user.	*Output contracting*
Risks all placed in one hand	**Intelligent risk allocation:** a risk should be allocated to the party that is best able to manage that risk. If too many or the wrong risks are held by either the public or private party the PPP will not add value.	*Risks with party best able to manage risk*
Less project phases in one hand	**Lifecycle optimization:** integrating different components and phases of a service increases its performance over its lifecycle and minimizes interface problems.	*More project phases in one hand*
Informal contracts	**Formal contracting**: formal contracting with clear legal recourse in case of disputes increases clarify and reduces risk.	*Formal contracting*
Less competition	**Competition / functioning market:** competition from an adequate number of companies increases value-for-money. PPPs without competition are inefficient.	*More competition*
Public financing	**Private financing:** private financing also results in strong oversight from debt and equity providers which can increase project performance.	Private financing

Understanding PPP

Private sector can absorb limited risks!

- The private sector is well-equipped to design, build, operate and maintain infrastructure services.
- But private sector is reluctant to take on risks it cannot control

Yes:	**performance risk**	**construction, maintenance risk**
Maybe:	**revenue risk**	**toll roads versus utilities**
No:	**political risk**	**policy changes**

Understanding PPP

PPP is more than just: the user pays!

Two archetypes of PPP

Performance Improvement Public Private Partnerships

Characteristic
- Private delivery of public service
- Government pays private partner
- Performance (availability) related payments
- Emphasis on incentive structure in PPP contract
- Transfer of performance risk

Examples:
DBFM(O) contracts for
Rail, roads, energy/water plants, accommodation

Revenue Creation Public Private Partnerships

Characteristic
- Private delivery of temporarily privatised public service
- User pays private partner
- Shortfall paid by government
- Emphasis on entrepreneurial freedom in PPP contract
- Transfer of revenue risk

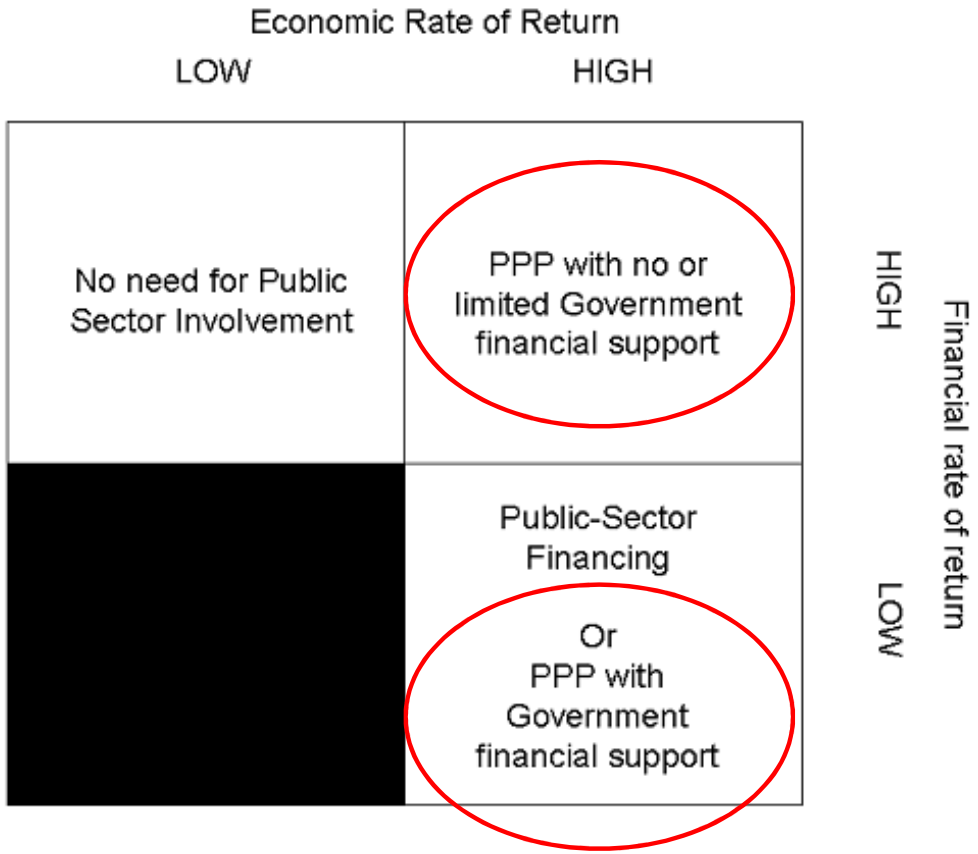
Examples:
Toll roads
Energy/water companies
Ports

Project Screening
What should a PPP Project demonstrate?

Value for Money	Demonstrate value in bringing the private sector
Optimum risk transfer to the private sector	Risk allocated to party best able to manage it
Affordability	Government can afford short and long-term payments Users can afford tarriffs

Project Screening
Public financing or Private financing ?

- PPP projects should have high economic/social benefits.
- Suitable PPP structure depends on financial aspects of the project.

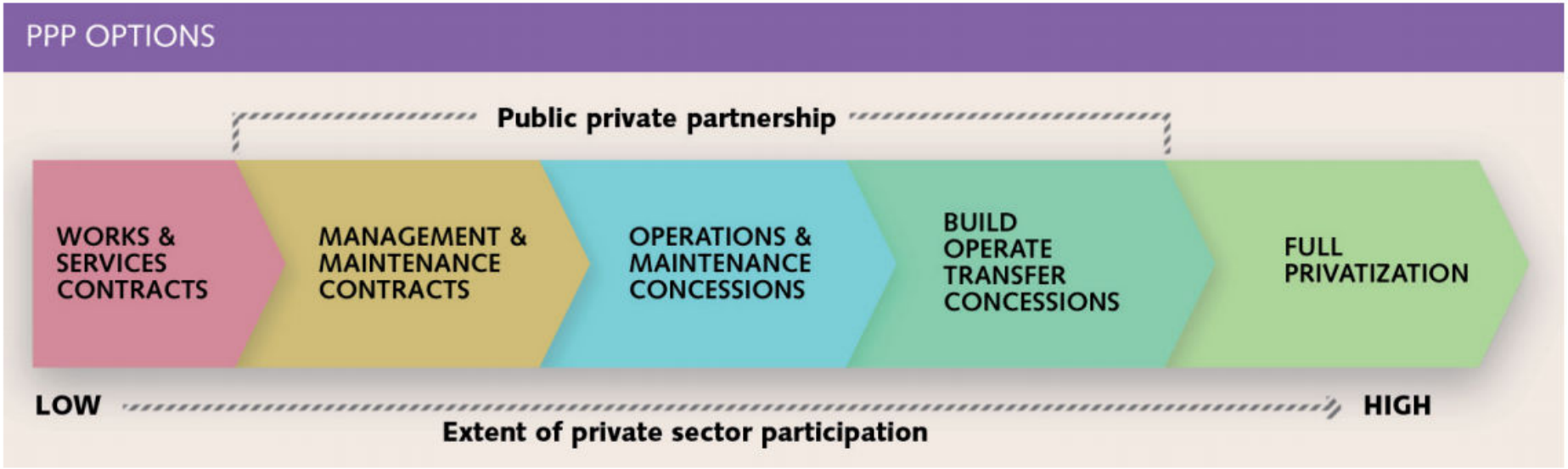


Types of Public-Private Partnerships

Public-Private Partnerships (PPP) for Highway Management: Overview

Extent of private sector participation

- PPP options always characterized by the level of private sector participation
- Suitable PPP option depends on the circumstances specific to a project.

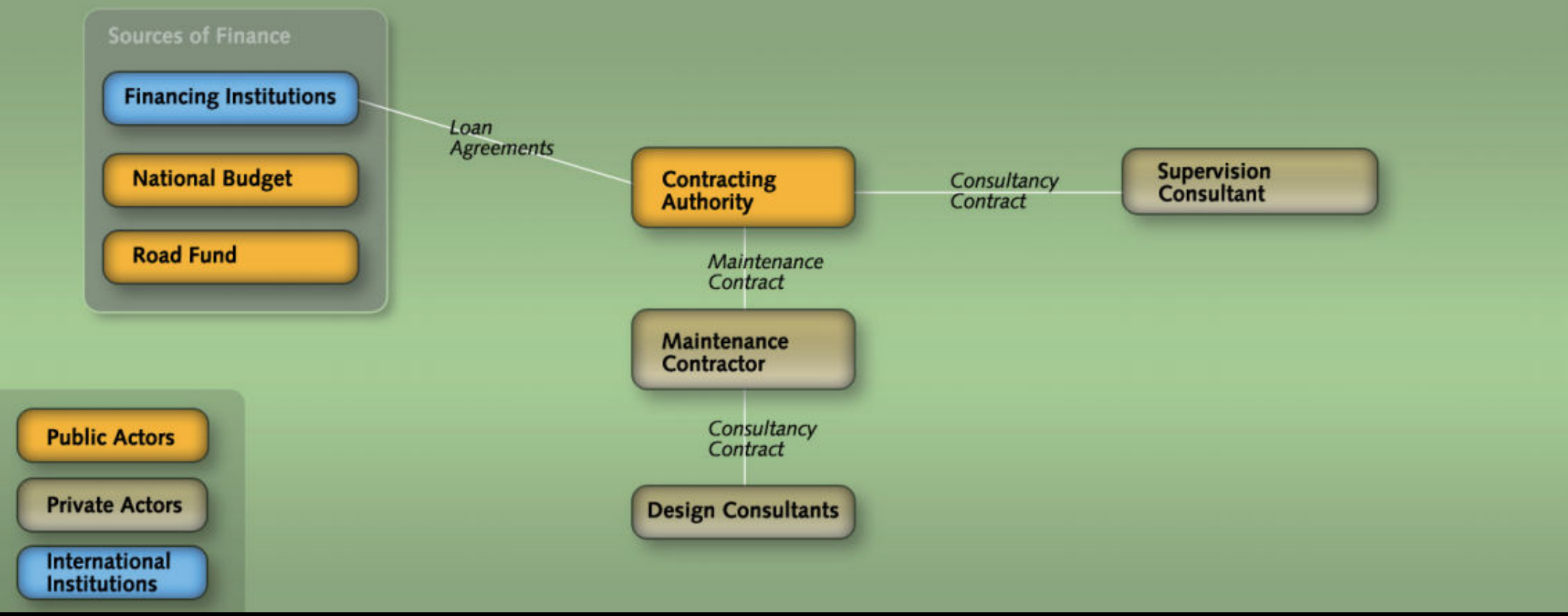


Types of PPP

1. Management and Maintenance Contracts

- Transfer the responsibility of management and maintenance of the project to the private sector
- Normally, short term, but longer than traditional work or service contracts
- Payment to the private sector on a fixed fee basis or an incentive basis (receiving premiums if achieving specified performance criteria)

MAINTENANCE CONTRACTS



Example of Maintenance Contract

Performance-based contract for road maintenance

Overview

- Reduce costs of road maintenance and rehabilitation and improve road condition through more efficient contract
- Phased payments over the life of the contract (4-10 years) to contractor based on pre-defined performance standards and penalties for non-performance (output-based contract)
- Typical performance indicators: Roughness (IRI); absence of potholes, cracks and rutting; friction; obstruction to drainage system; clarity of road signs and markings etc.
- Penalty applied if a problem stays longer than a specified "response time".

Example of Maintenance Contract

Performance-based contract for road maintenance

Traditional versus performance based contracting

	Traditional Contract	Performance Based Contract
Standard and service levels	Quality of road characteristics (defined as input)	Road user service and comfort (defined as output)
Project length	Relatively short	Longer time period, which allows to introduce strategic maintenance techniques
Maintenance costs	Limited cost reduction	All cost reduction as a result of strategic maintenance
Maintenance method	Pre-defined	Contract decides what, when, where, and how to do it.
Payment	Based on input and units	Based on performance and compliance with predefined level of service
Risk	Mostly with public sector	Mostly with private sector

Examples of performance indicators applied in different performance contracts in Latin America

Asset Class	Component	Performance Indicator
Pavement	Potholes	No potholes
	Roughness (asphalt)	IRI < 2.0 (Argentina), IRI < 2.8 (Uruguay)
	Roughness (bituminous) treatment)	IRI < 2.9 (Argentina), IRI < 3.4 (Uruguay)
	Rutting	< 12mm (Argentina), < 10mm (Uruguay, Chile)
	Cracks	Sealed
Gravel surfaces	Potholes	No potholes
	Roughness	IRI < 6 (Uruguay), IRI < 11 (Chile)
	Thickness of gravel layer	10 cm (Chile, Uruguay)
Shoulders	Potholes	No potholes
	Cracks	Sealed
	Joints with pavement	Vertical alignment < 1cm (Chile, Uruguay), sealed (Peru)
Drainage system	Obstructions	No obstructions. Should allow for free flow of water (Chile, Uruguay)
	Structures	Without damages and deformations (Chile, Peru)
Road signs and markings	Road signs	Complete and clean (Argentina, Chile, Peru)
	Road markings	Complete and visible (Argentina, Chile, Peru)
	Reflectivity of road markings	160 mcd/lx/sqm. (Argentina) 70 mcd/lx/sqm. (Uruguay)
Right of way	Vegetation	< 15cm height (Argentina, Uruguay)
	Foreign elements	No foreign elements allowed

Source: GTZ

Example of Maintenance Contract

Performance-based contract for road maintenance

Advantages

- Improved level of service
- Reduce risk of cost overrun through fixed-price contract
- More innovation
- Build a new industry
- Achieve economies of scale

Disadvantages

- Longer and more costly procurement process
- Reduction in competition
- Uncertainty associated with long-term contracts
- Loss of flexibility in budget relocation due to long-term commitment

10 %– 40 % cost savings of PBMC

COST SAVINGS OF PBMC RELATIVE TO CONVENTIONAL CONTRACTS IN SELECTED COUNTRIES

Country	Cost Savings
Norway	About 20%–40%
Sweden	About 30%
Finland	About 30%–35%
Holland	About 30%–40%
Estonia	20%–40%
England	10% minimum
Australia	10%–40%
New Zealand	About 20%–30%
United States	10%–15%
Ontario, Canada	About 10%
Alberta, Canada	About 20%
British Columbia, Canada	Some, but might be on the order of 10%

Source: P. Pakkala cited in World Bank Transport Note No. TN-27, Sep. 2005.

Example of Maintenance Contract

Performance-based contract for road maintenance

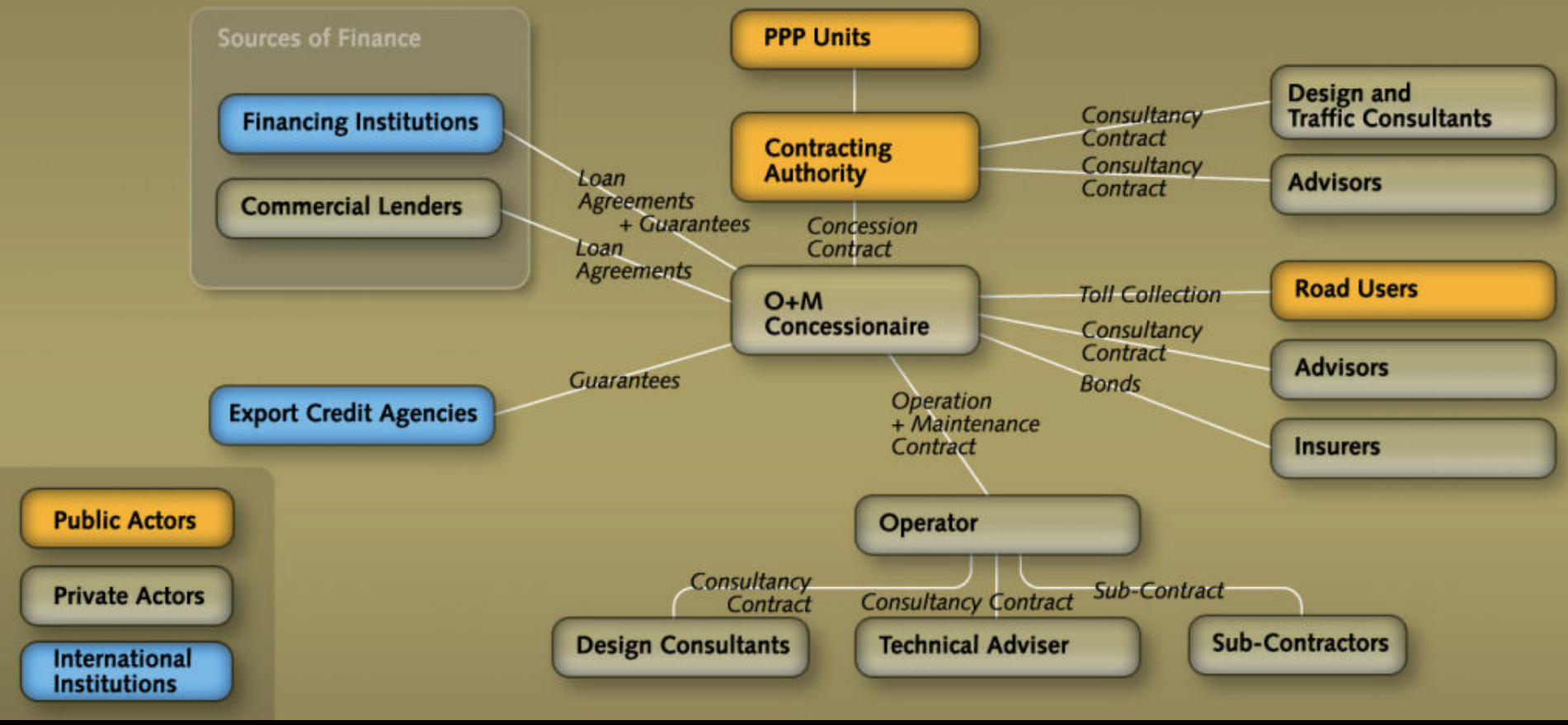
Key Issues

- Need for carefully planned pilot schemes and tailored contracts
- Contract period should include at least one periodic maintenance and might require rehabilitation at the beginning
- Proper performance monitoring and strict application of clearly defined penalties for non-compliance are important.
- Capacity of contractors, inspectors and road administration agency is key

2. Operation and Maintenance Concessions

- Namely, service concessions - not provide for the provision of infrastructure
- The private sector take the operation and maintenance of the already existing road or facility
- The government may grant a concession to the private sector to charge users to help finance the improved operation and maintenance of the road or facility.
- This enables the public sector to transfer commercial risk to the private sector and to create incentives for the private sector to ensure efficient revenue collection and to undertake regular maintenance to increase the reliability of facilities and postpone their renewal

OPERATIONS & MAINTENANCE CONCESSIONS



Example of O&M Concession

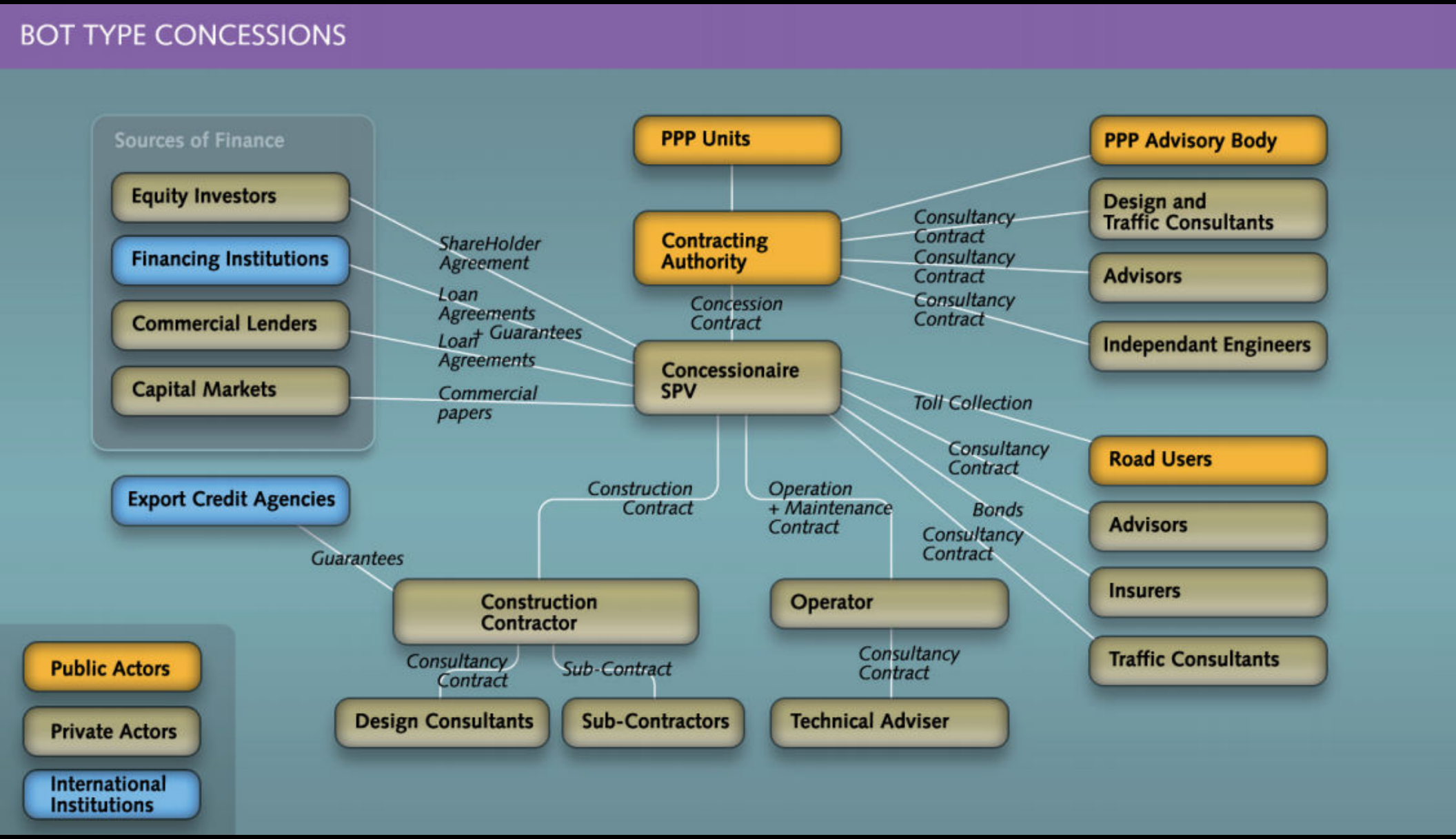
Motorway Service Areas (MSAs)

- Motorway service areas, also known as service stations, are places where drivers can leave a motorway to refuel, rest, or take refreshments.
- Government finances the construction of MSAs and may grant O&M concessions to private companies, which are required to maintain facilities and provide 24-hour services everyday (e.g. toilets, food and drink, petrol)
- Concessionaires pay a fixed annual rent and/or share commercial revenues to the government.

3. BOT Types of Concessions

- Most common PPP model
- Namely, work concessions
- Under a BOT, the responsibility of the concessionaire is not limited to operation and maintenance of the infrastructure but also comprises an initial construction, upgrading or major road rehabilitation component.
- BOT (Build Operate Transfer) stresses the responsibility of the private entity during construction and operation of the road and the handing over (transfer) of the assets to the public entity at the end of the operation period.
- variations such as Build-transfer-operate (BTO), Build-own-operate (BOO), Design Build Finance Operate (DBFO), etc.

BOT TYPE CONCESSIONS



Example of BOT Concessionaire
Toll Road BOT

Overview

- involves the grant of a concession to a special purpose vehicle/company (the concessionaire)
- Under the concession, the concessionaire would agree to finance, build, control and operate a facility for a limited time, typically 20 to 35 years, after which responsibility for the facility is transferred to the government, usually free of charge.
- The concessionaire typically assume primary responsibility for constructing the project, arranging financing, performing maintenance, and collect tolls, while the public sector retains legal ownership.

Typical PPP Structure for Road Infrastructure Projects

Public-Private Partnerships (PPP) for Highway Management: Overview

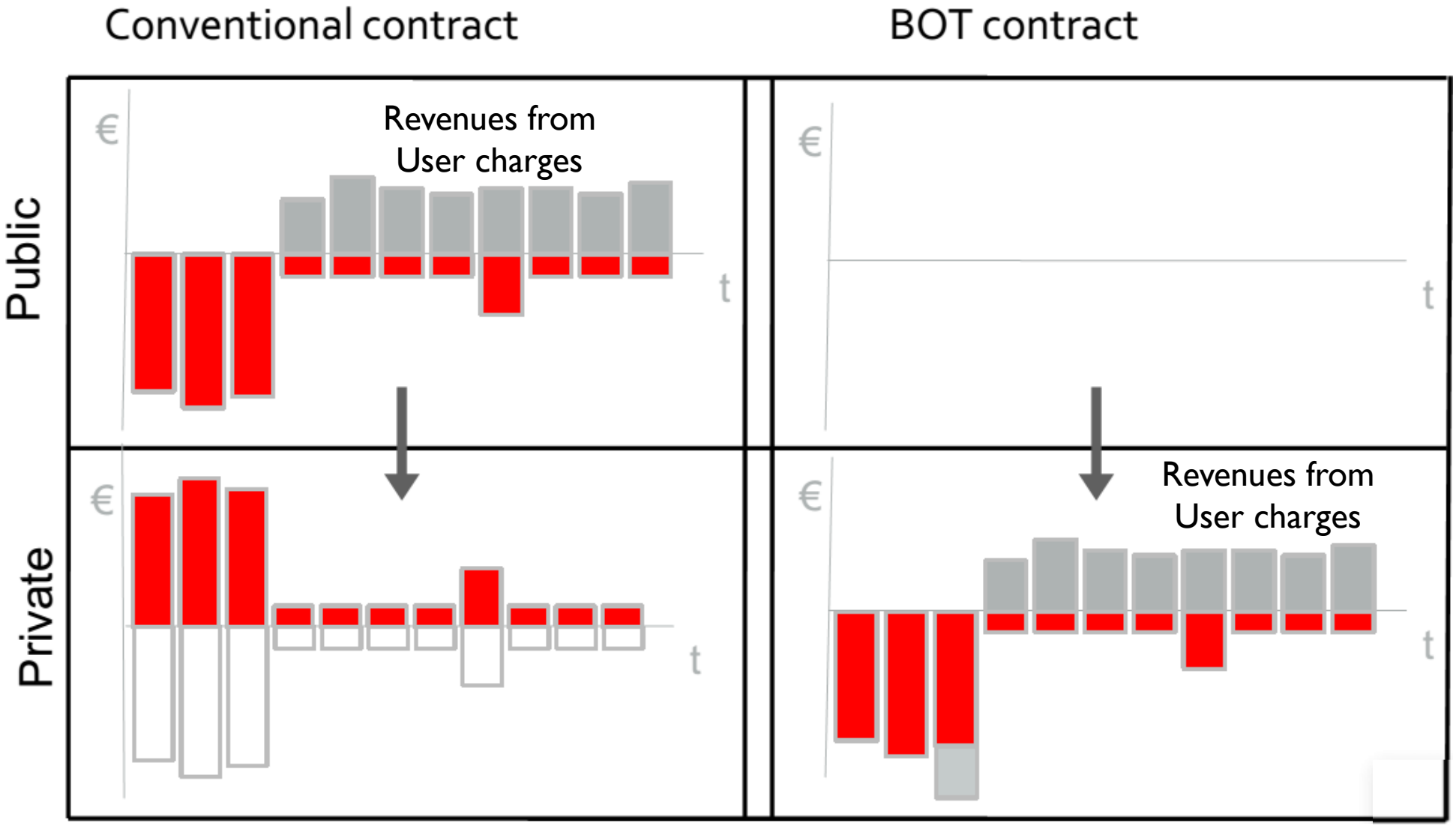
Typical PPP Structure

- User fee contracts (BOT, etc)
- Availability-based contracts (DBFM, etc)
- Hybrid approach

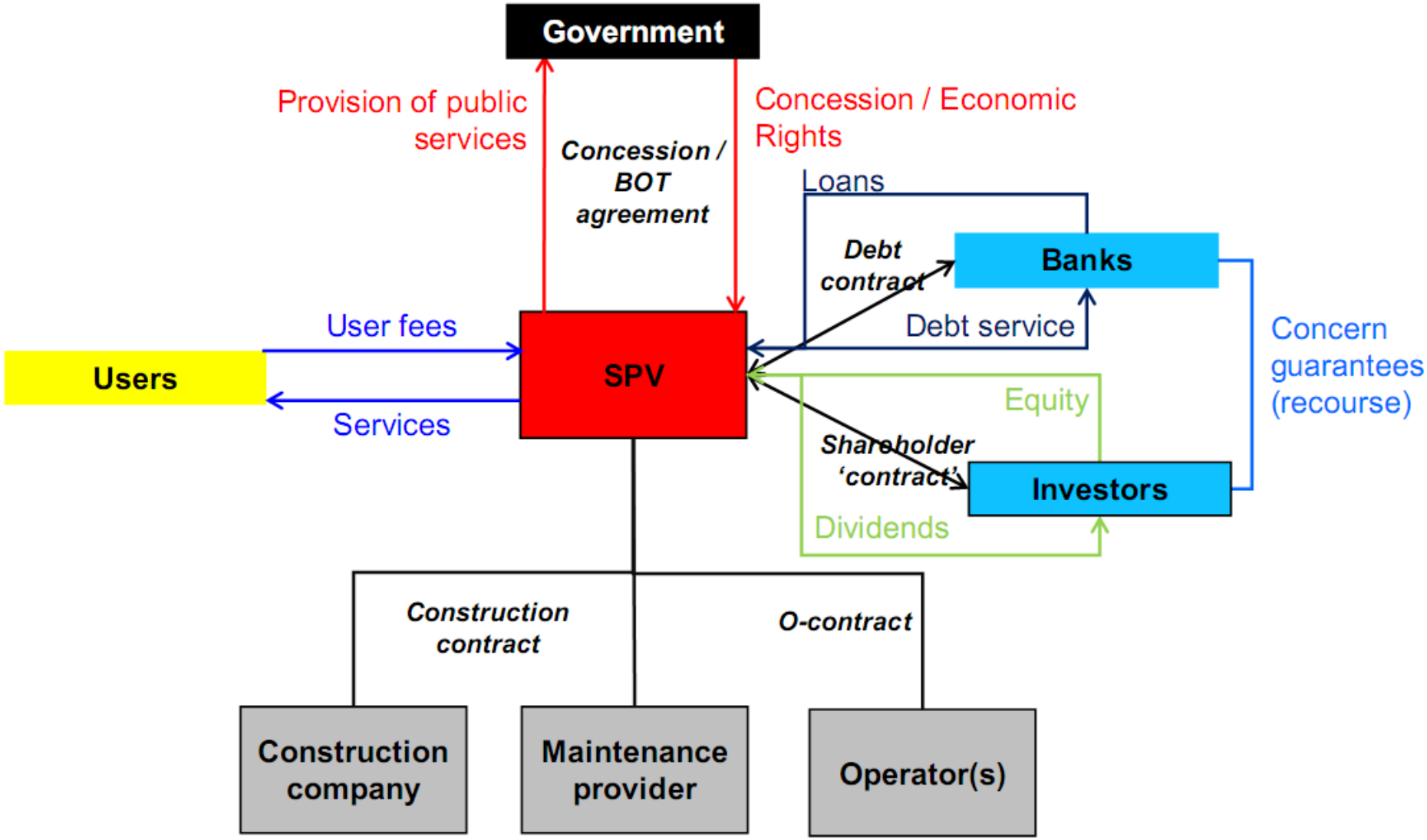
Typical PPP structure

User fee contracts

- traditionally under a concession model, characterized by the direct link between the private partner and the final user;
- The concessionaire is allowed to charge the general public service fees for using the facility, generally through paying a toll.
- The toll reimburses the concessionaire for the cost of building and operating the facility, which can revert back to the public sector at the end of the concession period.


Conventional contract
BOT contract
Public
Private
€
t
Revenues from
User charges
€
t
€
t
€
t
Revenues from
User charges

Example of BOT contract

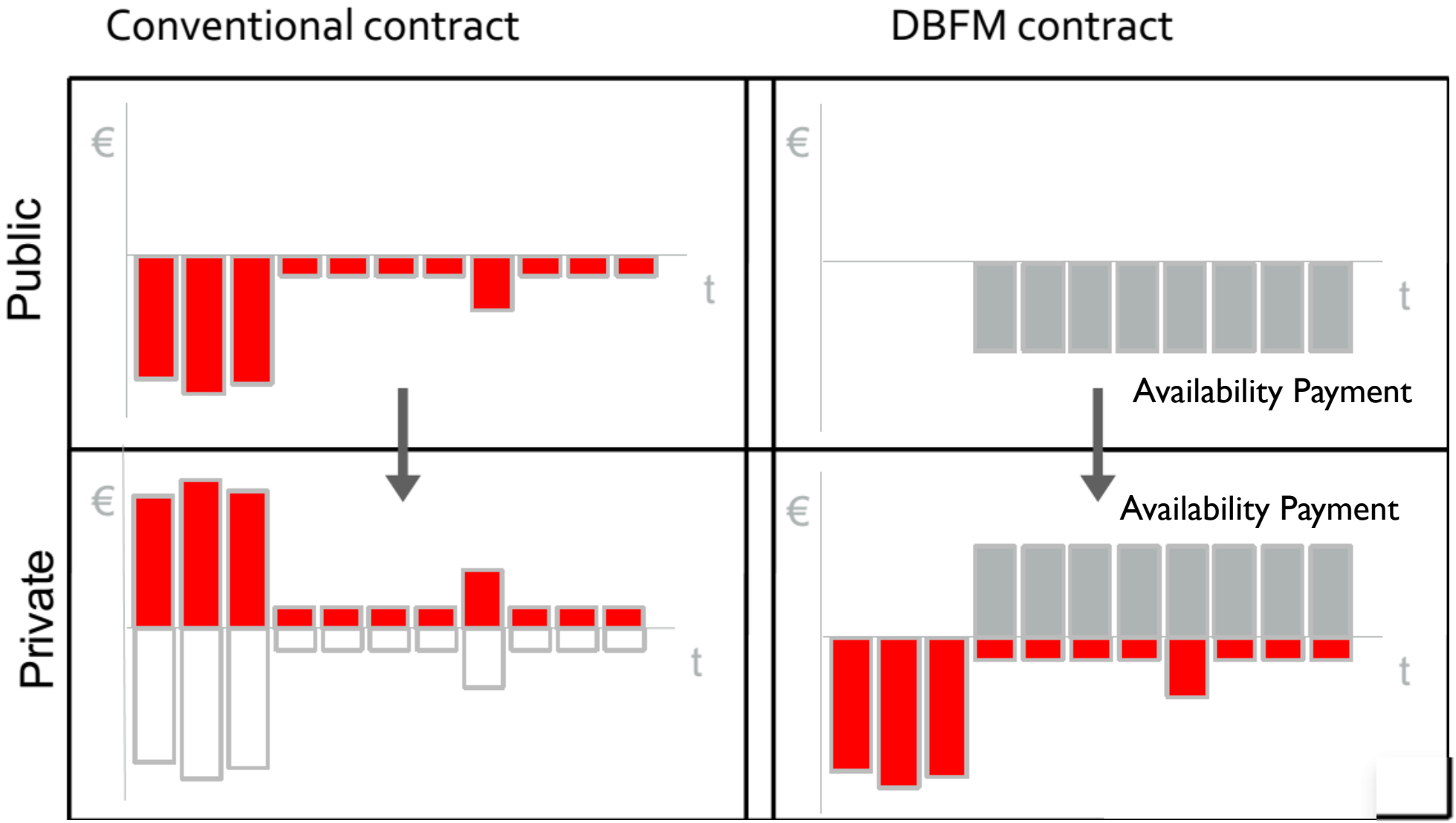


Toll road companies

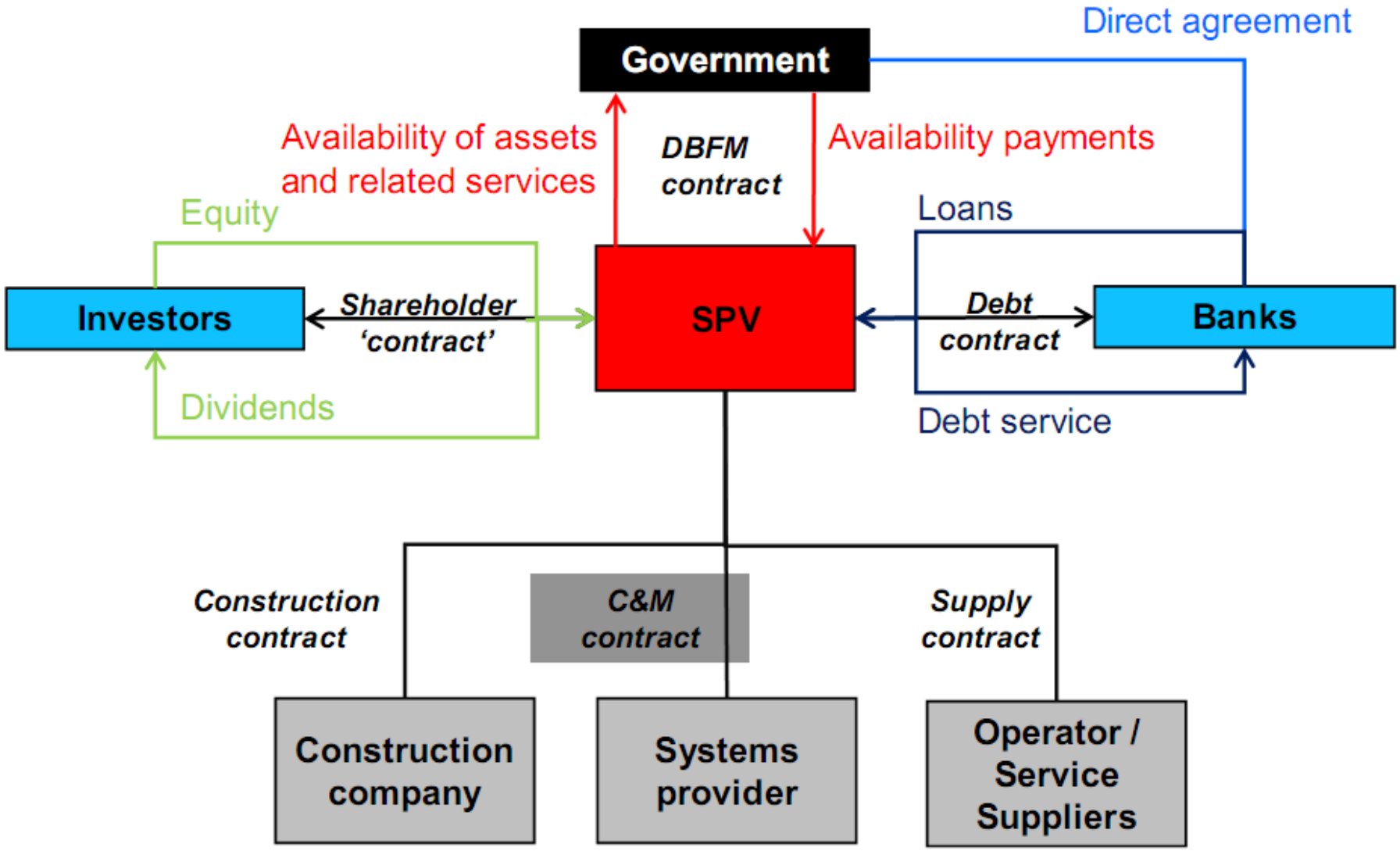
Typical PPP structure

Availability-based contract

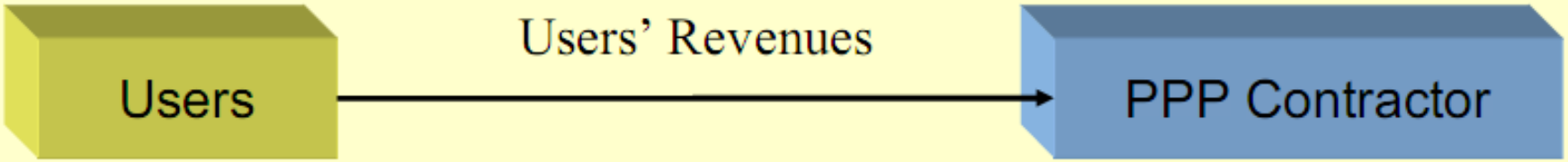
- The remuneration for the private sector does not take the form of charges paid by the users of the works or of the service, but of regular payments by the public partner based on the level of service provided.
- These payments may be fixed or variable
  - Shadow tolls – payment is linked to traffic level
  - Availability payments – payment is linked to how facility performance standards are achieved.


Conventional contract
DBFM contract
Public
Private
€
t
Availability Payment
Availability Payment

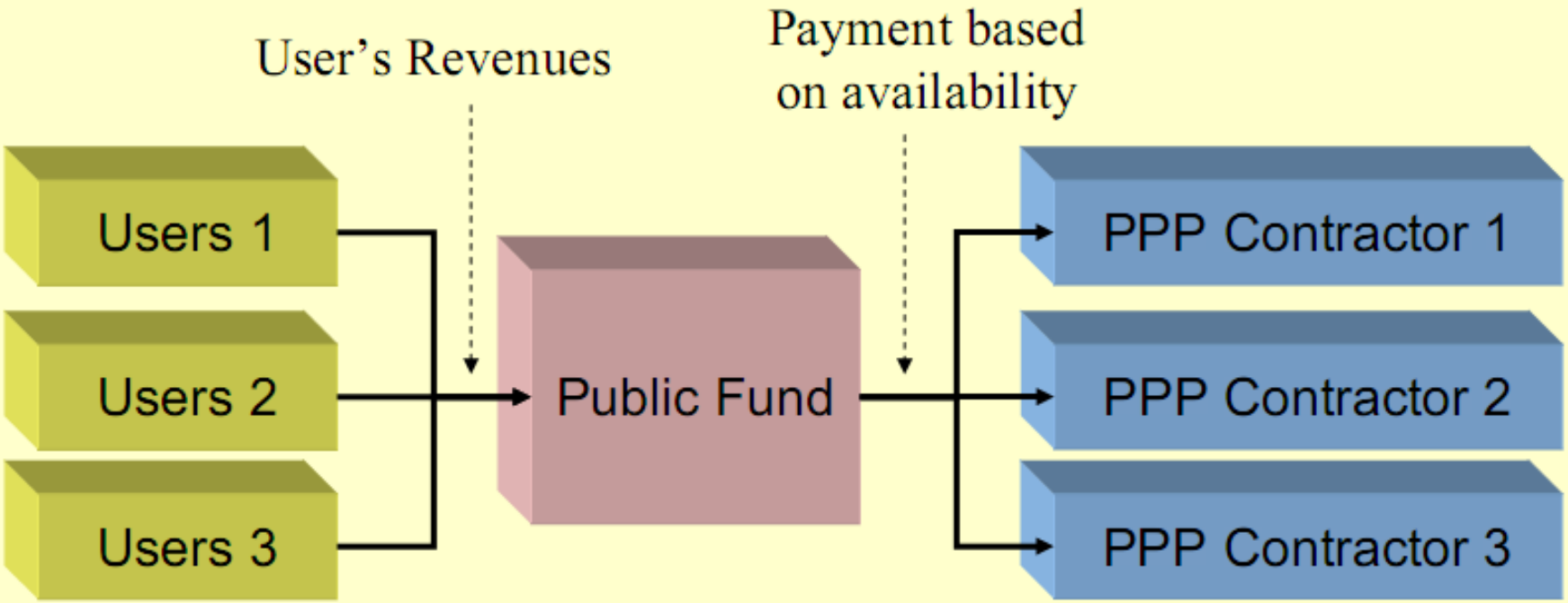
Example of availability based mechanism



Traditional concession approach



Alternative concession approach

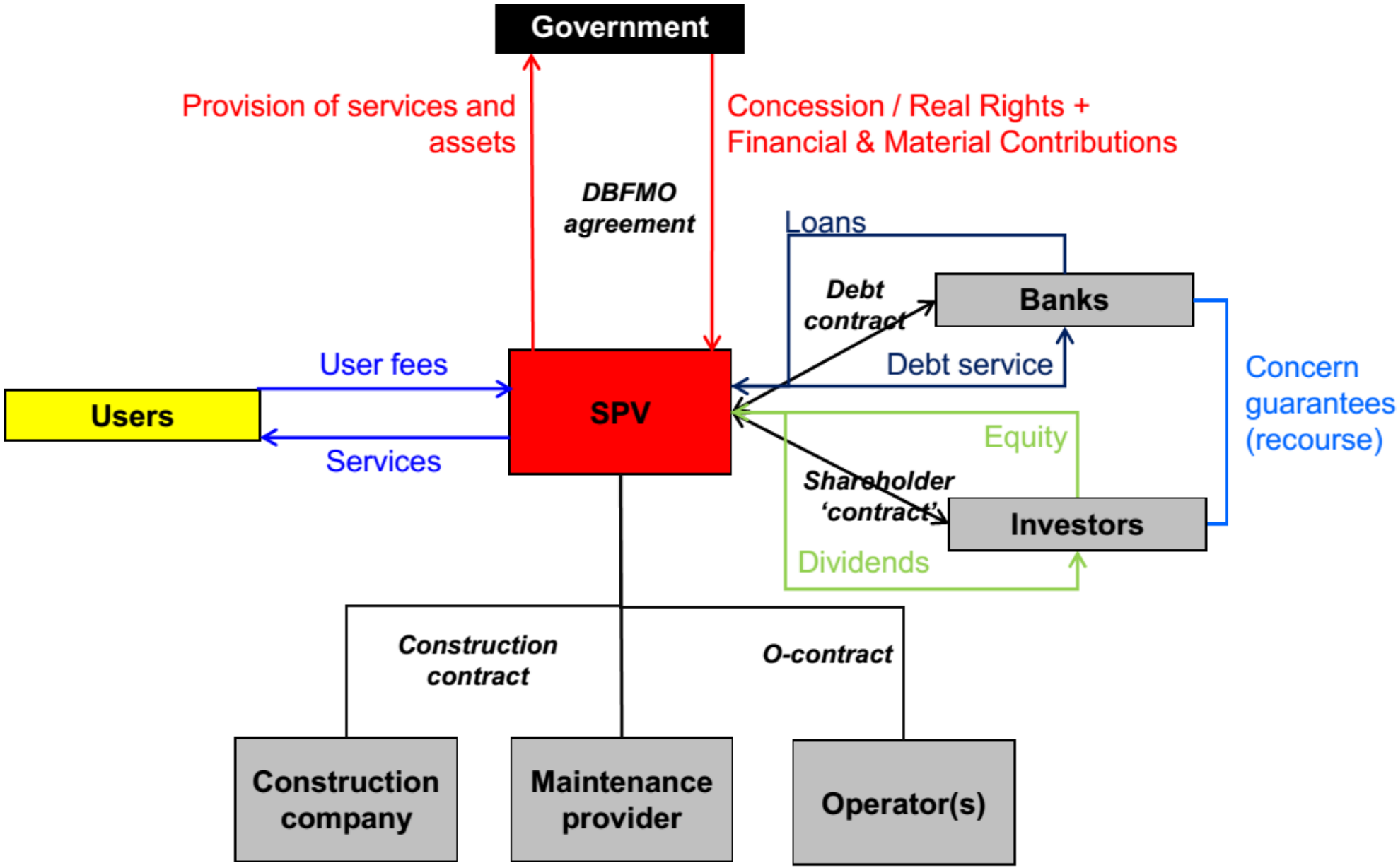


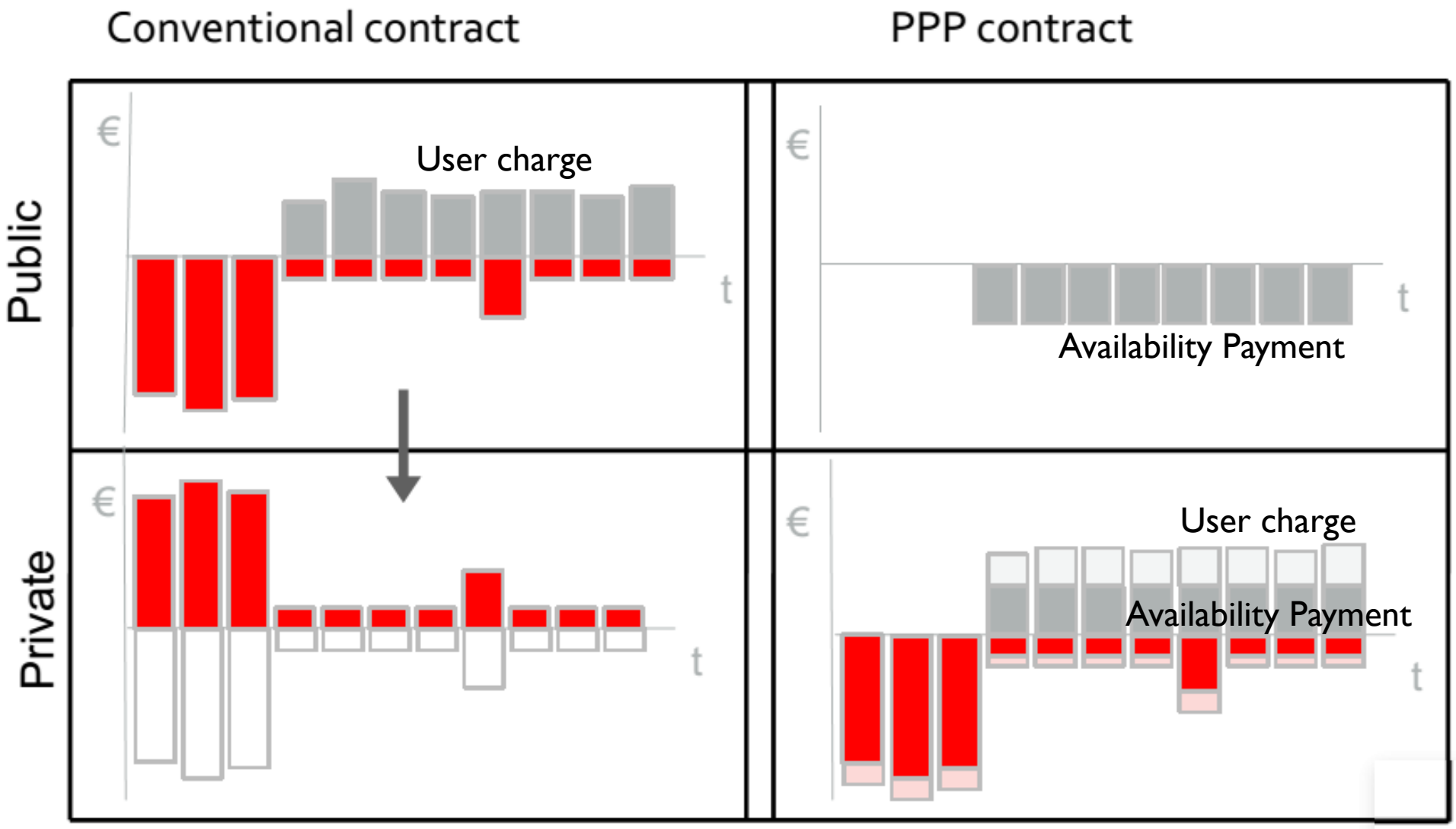
Typical PPP structure

Hybrid approach

- Combinations of user fees and availability payments
- Applied in projects that are not viable in full (viability gap) and/or where user fees are not 'acceptable'
- Upfront Grants and Provision of rights to use land / existing assets, etc.

Example of hybrid mechanism




Conventional contract
PPP contract
Public
Private
€
t
User charge
Availability Payment
User charge
Availability Payment

Examples of PPPs in Infrastructure

Public-Private Partnerships (PPP) for Highway Management: Overview

PPPs in Physical Infrastructure

- Large capital investment, substantial revenue flows, long time frames
- • Such as roads, railways, bridges, tunnels, ports, airports, etc.

Westlink M7, Sydney, Australia – BOT 'Off-Budget'

- 40 km motorway linking the M2, M4 and M5 motorways
- Built, operated, maintained as fully tolled gateless motorway (electronic toll charges)
- 34-year concession
- No governmental guarantees

N31 Leeuwarden – Drachten Highway, The Netherlands – DBFM 'On-Budget'

- Upgrade and double the lanes of 13 km motorway
- 15-year DBFM
- € 78m project
- Payments fully on an availability basis

PPPs in Social Infrastructure

- Such as education, health, welfare systems, social housing, etc.

Tunbridge Wells Hospital, UK – DBFO	
• £307 m project • Development of Pembury hospital • 30-year DBFO • Payments are on an availability basis • Facility, not the doctors and nurses!	
Benelux Bundle of 200 Schools	
• Refurbish and expand 200 schools • 30-year DBFO structure, separation of financing and construction in different PPPs • Payment on availability basis • Bundling necessary as each school is too small to be a viable PPP!	

PPPs in Strategic Infrastructure

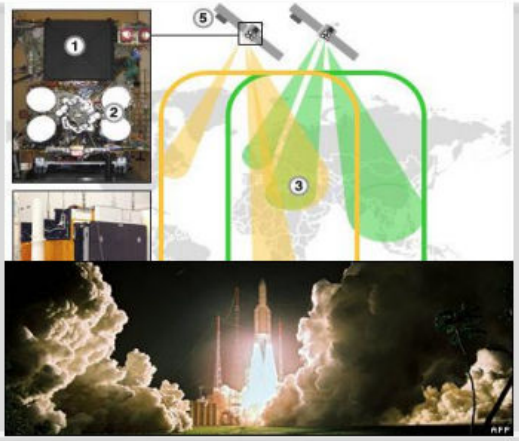
- Such as prisons, military, policies, border management, etc.

Benoni Emergency Services, South Africa

- Fire & paramedic / ambulance services PPP
- Payment based on availability and performance
- Strong penalty conditions
- Good increase in service levels

Skynet Military Satellites, UK

- 3 new satellites with high speed data transfer
- Sued for Army, Royal Navy and RAF globally
- 18 years DBFMO
- £ 2.6 billion PFI deal
- Paid on availability of data service
- Unused data capacity can be sold to Nato or other friendly nations



What does it take? PPP Process

Public-Private Partnerships (PPP) for Highway Management: Overview

What does it take? The PPP process

1. Project definition
2. Assessment of PPP potential
3. Undertake feasibility study
4. Develop business case (PPP structure)
5. Compare alternative delivery modes (traditional versus PPP) on value for money
6. Design and implement procurement process
7. Bid evaluation
8. Check value added of PPP model
9. Contract negotiation and award

Summary

Public-Private Partnerships (PPP) for Highway Management
: Overview

Summary

- Major global shift toward use of PPPs
- PPP can bring value by letting the public sector and business do what they do Best!
- Various types of PPP structure - the suitable one depends on circumstances specific to a project.
- PPP is more than just: the user pays!
  - User fee contract / Availability-based contract / Mixed
- A PPP project that is not financially viable but offers high economic/social benefits requires government contributions (e.g. incentives, subsidies)

Questions and Discussions

piyapong.j@gmail.com