



# **TOWARDS A FRAMEWORK FOR THE GOVERNANCE OF PUBLIC INFRASTRUCTURE**

## **OECD REPORT TO G20 FINANCE MINISTERS AND CENTRAL BANK GOVERNORS**

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## EXECUTIVE SUMMARY

### **Good governance is a necessary condition for good public infrastructure**

Infrastructure is the backbone of human and economic development, but it can be challenging to ensure that the right infrastructure is made available in a cost efficient, affordable and transparent manner. Given that the interests and challenges in developing infrastructure are common across countries, international good practices could help governments better seize opportunities and meet related challenges. Up to now, however, much of the debate on infrastructure has focused on the financing challenges - how to raise funding for infrastructure projects, by using national levers and accessing international markets - whereas the broader public governance dimension has been neglected. Building on discussions at OECD Networks and Committees this paper aims to offer guidance to Member and Partner countries in the area of public governance of infrastructure, where governments can bring their influence most directly to bear.

### **Infrastructure presents a governance challenge**

The governance challenges that can undermine sound infrastructure are many and varied. They include a weak capacity for designing a strategic vision for developing infrastructure and the absence of a sustainable development plan. Furthermore, without a well-managed consultation process good projects may falter. Equally, a lack of coordination amongst the multiplicity of actors involved may ultimately derail a project. There is oftentimes a lack of skills with regards to a whole-of-life perspective of infrastructure which can weaken both preparation and execution.

Uncertain revenue flows can result in a lack of confidence in the project's affordability. Infrastructure decisions tend to be bound by administrative perimeters rather than relevant functional ones, which means that assets may not be dimensioned appropriately. There is also a general lack of data on assets performance which makes it difficult to use assessment tools well. In addition, adverse incentives provided by regulatory frameworks, such as budgeting and accounting rules, may generate suboptimal investment choices.

Instability of the regulatory and institutional framework can also prevent long-term decisions, undermining sound decision-making from both public and private actors. Infrastructure procurement is a form of procurement that is inherently vulnerable to corruption. Experience shows that political and business cycle issues strongly impact the phases of infrastructure. Finally, identifying, pricing and allocating risks between public and private parties can be difficult.

### **Towards framework for the governance of infrastructure**

The objective of the framework presented in this paper is therefore to ensure infrastructure programmes that make the **right projects** happen, in a **cost-efficient** and **affordable** manner that is **trusted** by users and citizens to take their views into account. The framework offers decision makers a methodology to analyse challenges, mapping out options on how to solve them, and guides them in carrying through decisions. It consists of two components: i) a list of governance preconditions - these concern the overall enabling governance environment for infrastructure; and, ii) a decision tree, which guides countries with respect to making sectoral decisions and overall infrastructure decisions.

### **Governance preconditions**

There is a set of governance dimensions that needs to be in place, regardless of the choice of delivery modality. These can be available in a multiplicity of organisational and institutional models, and

this to a greater or lesser extent. A strong capacity with regards to one pre-condition can to some extent compensate for a weaker capacity in another. However, experience shows that they are mutually reinforcing and must be pursued as a package.

1. A long-term national strategic vision for the use of infrastructure should be in place, which takes into account the multi-dimensionality of the challenges.
2. Regulatory frameworks, principles and processes should encourage the sustainable and affordable development, management and renewal of infrastructure.
3. The process for managing infrastructure projects over their life-cycle delivery should be user-centric. It should rest on broad based consultations, structured engagement and access to information and have a primary focus on the users' needs.
4. Coordination across levels of government and jurisdictions should be frank, regular and performance oriented. Coordination within levels of government should balance whole of government perspectives and sectoral views.
5. The appropriate skills and procedures to ensure rigorous projects assurance, affordability, value for money and transparency should be in place.
6. Project assessments should be based on data and a balanced value for money procedure.
7. Systems should be in place to ensure a focus on the performance of the asset throughout its life.
8. Map corruption entry points at each stage of the public infrastructure project and enhance integrity and anti-corruption mechanisms
9. The choice of the appropriate delivery modality should integrate political, sectoral, and strategic aspects.

### **Choosing strategy and delivery method**

The choice of how infrastructure is delivered has implications for public sector discretionary control, value-for-money and affordability. In many countries, however, the choice of modality is often based on habit and lacks specific criteria. The decision tree sets forth some key questions that enable countries to take a fresh look at their infrastructure delivery choices and identify where a change might add value given new priorities. The framework presented offers a three-step process based on sectoral criteria, country criteria (national/sub-national levels) and project criteria. It suggests that countries:

- Set a preferred sectoral approach by assessing reform objectives and the characteristics of the sector.
- Assess how the country circumstances (political economy, government's capacities, private sector's capacities, enabling legal environment, etc.) impact the sector.
- Choose a delivery model based on the project characteristics and overall approach

The above framework does not provide a 'cook-book' formula for determining how to deliver an infrastructure asset, nor does it suggest a 'one-size-fits-all' institutional structure for government. These decisions normally take place in an iterative fashion, with policy objectives, political economy and facts on the ground each informing the decision. However, the paper argues that it is necessary for countries to address the challenges of infrastructure governance in order to ensure legitimate, cost-efficient and affordable infrastructure. The framework presented provides the necessary foundation for such an endeavour.

## 1. INTRODUCTION

### 1.1. Good governance is a necessary condition for good infrastructure delivery

1. Infrastructure is the backbone of economic capacity, but it also impacts directly on human development, social inclusion, environmental sustainability and so the development of infrastructure is a fundamental concern of both governments and citizens. This is the case irrespective of the stage of development of a country, or of the prevailing economic culture and practice. What matters to governments around the world, and to the citizens they represent, is having in place high-quality infrastructure that supports the delivery of effective public services -- in transport, education, health, culture, or any of the myriad of policy areas that affect people's lives. Given the common issues, interests and challenges in developing infrastructure, clear international guidance and good practices can help governments and public authorities in meeting these challenges. This paper aims to provide such guidance, precisely in the areas where governments and public authorities can bring their influence most directly to bear – in the area of public governance.

2. Up to now, much of the current global debate on infrastructure has focused directly on the financing challenges -- how to raise funding for infrastructure projects, by using national levers and accessing international markets -- whereas the broader public governance dimension has been neglected. However, OECD analysis has shown that substantial benefits can be realised by better managing public investment throughout its "life cycle" and across levels of government; and that the quality of public governance correlates with public investment and growth outcomes, at both national and sub-national levels (OECD, 2013). As with all areas of public governance, the governance of infrastructure entails its own distinct set of challenges and requires a considered, systematic approach. Indeed, the OECD guidance on overall budgetary governance (OECD, 2015c) recognises the distinct set of factors required to support public investment in infrastructure -- including institutional capacity, public procedures, institutions and tools -- and calls for the development of a coherent and integrated national framework. The elements and contours of a national governance framework for infrastructure, which is capable of providing the right infrastructure in a cost efficient, legitimate and affordable manner -- are set out in this paper.

3. How can we go about identifying the elements of good infrastructure governance? One natural starting point is to assess the challenges that arise when governance arrangements fall short. Poor governance is a major reason why infrastructure projects fail to meet their timeframe, budget and service delivery objectives. Infrastructure projects with deficient governance often result in cost overruns, delays, underperformance, underutilisation, accelerated deterioration due to poor maintenance, and, occasionally, in expensive "*white elephants*" and bridges-to-nowhere.

4. In addition, evidence suggests that there are efficiencies that can be harnessed from a new and more comprehensive life cycle approach to public infrastructure (Productivity Commission 2014, Burger and Hawkesworth, 2010; Flyvbjerg *et al*, 2002). Meeting these new demands will require a re-thinking and a modernisation of the public governance of infrastructure. The answer will, in its broadest sense, focus on good governance in terms of good planning, budgeting, project assessment and evaluation (throughout the project cycle), transparency, accountability and regulation. It will demand a strengthening of the entire institutional architecture of government in order to deliver the right strategic infrastructure on time, within budget and in a manner that commands the confidence of all stakeholders.

### 1.2. What is infrastructure governance?

5. By the governance of infrastructure is meant the processes, tools and norms of interaction, decision-making and monitoring used by governmental organisations and their counterparts with respect to

making infrastructure services available to the public and the public sector. It thus relates to the interaction between government institutions internally, as well as their interaction with the private sector, users and citizens. It covers the entire life cycle of the asset, but the most resource intensive activities will typically be the planning and decision-making phase for most assets. More specifically it relates to the relationship between the delivery modality and the public and private sectors as described in Box 1.1.

### **1.3. The focus is on public infrastructure**

6. By public infrastructure is meant facilities, structures, networks, systems, plant, property, equipment, or physical assets -- and the enterprises that employ them -- that provide public goods, or goods that meet a politically mandated, fundamental need that the market is not able to provide on its own. This definition thus ranges from the direct provision of military installations to privately-owned and -operated utilities under government regulation, such as energy.

7. Public infrastructure is a fundamental component in the delivery of key public services in most countries. These services range from the traditional public-sector domains of defence, law enforcement, power generation, water, sanitation and transport to the social infrastructure, such as health care, social security, skills development, knowledge and innovation. The nature of the asset also varies from traditional fixed assets such as bridges and buildings to ICT architecture. In addition, sound public infrastructure is a key driver of enhanced capacity for real economic growth, both in the short and long terms. Infrastructure networks reduce the effect of distance, help integrate markets, and provide the necessary connections to international markets. These networks are also trade enhancing, especially when it comes to exports. Infrastructure services such as energy and water are critical inputs in production chains, the availability and quality of which determine both the quantity and price of outputs.



### **Box 1.1 - Modes of infrastructure delivery**

#### Direct provision

Direct provision of infrastructure involves the government taking responsibility for all aspects of infrastructure delivery, including financing, construction and subsequent service delivery. This mode affords the government a maximum level of control over the infrastructure asset.

#### Traditional public procurement

In the traditional public procurement mode, a government body contracts with private partners to provide infrastructure-based goods and services. The government will contract separately for the design, construction, operation and maintenance of infrastructure assets. Contracts are allocated using competitive tender processes in order to obtain the optimal bundle of quality features and price.

#### State-owned enterprises

Infrastructure, particularly in network industries such as water, public transport and electricity is often provided by state-owned enterprises (SOEs) that are owned (fully or partially) by the government. The government may relinquish infrastructure investments to an SOE if the latter is able to raise finance independently, although the actual investment decision may still be subject to government controls if they have fiscal implications. This may be an efficient mechanism for the delivery of infrastructure, especially if the SOE is be "corporatised" as an independent legal entity and subjected to commercial pressures. An efficient solution further calls for the state's roles as enterprise owner and regulator to be conducted separately (DAF/CA/SOPP(2014)1/REV4).

#### Public-Private Partnerships and Concessions

Public-private partnerships (PPPs) involve private investors financing and managing the construction of an infrastructure asset, which they then typically operate and maintain for a long period, often extending to 20 or 30 years. In return, the private partner receives a stream of payments to cover the capital expense as well as the operating and maintenance costs. This payment stream may be derived from the national budget, user fees or a combination of the two. Private firms are responsible for financing, constructing and operating the infrastructure assets. Governments retain control over project selection, establish the framework conditions and retain some regulatory powers.

#### Privatisation with regulation

When conditions for a competitive market exist in a particular sector, private firms subject to the discipline of market forces may provide the most efficient mechanism for the provision of infrastructure. In this mode of infrastructure delivery, private firms are not only responsible for the financing and delivery of infrastructure, but they also make investment decisions relating to which infrastructure assets to build. There are many cases of privatisation of sectors with market failures, e.g. water and energy. When privatisation has been the preferred option, governments have in parallel strengthened regulatory oversight in the sectors at stake -- this has been notably the case with the establishment of independent regulators in the energy and water sectors when systems have been privatised.

## **1.4. Infrastructure investment is needed, but the scale varies**

8. Estimates from the OECD suggest that annual global investment requirements by 2030 for telecommunications, road, rail, electricity (transmission and distribution) and water are likely to total around an average of 2.5% of world GDP. If electricity generation and other energy-related infrastructure investments in oil, gas and coal are included, the annual share rises to 3.5% of GDP (OECD, 2007). At the 2014 Meeting of Senior PPP Officials, Standard and Poor's estimated annual global funding needs for infrastructure at \$3.4 trillion annually. These kind of assessments should, however, be taken with a grain of salt. There is little evidence that shows that such need assessments have historically hit the mark.

9. There are obviously differences between the needs of more mature economies, as found in OECD Member countries, and in more rapidly emerging economies. For OECD Member countries the needs are

mainly found in the maintenance and upgrade of the existing stock of infrastructure. Indeed, in EU countries, around 70% of public investment is spent on maintenance costs associated with past infrastructure investments (OECD, 2014d). New build needs are to be found in assets meant to mitigate the effects of climate change, new green energy modalities and meeting the needs of ageing of societies. There is also some evidence that points towards under investment in recent years. For the OECD area as a whole, government spending on gross fixed capital formation as a share of total general government outlays fell from 9.5% in 1990 through 8% in the mid-1990s to approximately 7% in 2005 and 6.7% in 2011 (OECD, 2013). In addition, the global financial crisis has meant that governments and the private sector have been investing less. In the EU, for example, sub-national public investment declined by more than 20% over 2009-2012 (OECD, 2014d).

10. In rapidly emerging economies, the investment needs are clearer. The ADB estimates that the Asia Pacific region needs \$800 billion yearly in annual infrastructure investment until 2020. The U.N. projects that the world's population will reach 9 billion by 2050, from about 7.1 billion today. Most of that increase will come from the developing world, where the population could surge by almost one-half -- in particular in urban areas. There is thus a clear global need for new economic infrastructure in the areas of energy, water, transportation, as well as in social infrastructure such as schools and hospitals.

### **1.5. Background and next steps for the paper**

11. In response to discussions on the need for further study on how to think about infrastructure governance and modality choice at the 2014 Annual Meeting of Senior PPP Officials 17-18 February 2014, Paris, this paper sets out a draft framework for the public governance and delivery of infrastructure. The ambition is to harness OECD Member country experience into a coherent tool that countries can apply to ensure that their infrastructure investment is effective, efficient, transparent, user centric and affordable.

12. This paper is based on the accumulated infrastructure work of the OECD, including in the areas of Public-Private Partnerships, budgeting, fiscal policy and governance across levels of government, regulatory policy, integrity and anti-corruption, and public sector innovation (see Box 1.2).

13. This endeavour has been ongoing for the last year and has benefited from substantial input from national officials, international organisations and academia. A High Level Focus Group of decision makers and experts was organised on the 29 of January 2015 in Paris on the basis of a previous version of this paper. The Focus Group's contributions are gratefully acknowledged. On 23-24 March 2015 the framework was endorsed at the Annual Meeting of Senior PPP and Infrastructure Officials and by the Public Governance Committee was consulted by written procedure by the 10<sup>th</sup> of April 2015. The comments and contributions by member state officials are much appreciated.

14. On this basis the OECD presents this paper to Working Party of Senior Budget Officials in order to receive their input as to whether the issues and approach are in line with the needs and state of play for infrastructure in their countries as well as possible follow up activities.

### **1.6. How to read this paper**

15. This paper is organised into two main parts. The first part consists of sections 1 and 2. It sets out the basic premise for the endeavour and contains a summary of the draft framework. The second part consists of sections 3 and 4. It gives more detail regarding the components of the framework by discussing the governance preconditions and the components of a decision tree for the selection of an infrastructure delivery mode in more detail.

**Box 1.2 - Key relevant OECD Recommendations and policy tools that inform this work**

- OECD (2015) Recommendation of the Council on Public Procurement
- OECD (2015) Recommendation of the Council on on Budgetary Governance
- OECD (2014) Recommendation of the Council on Digital Government Strategies
- OECD (2014) Recommendation of the Council on Effective Public Investment Across Levels of Government
- OECD (2014), The Governance of Regulators, OECD Best-Practice Principles for Regulatory Policy
- OECD (2014) Recommendation of the Council on the Governance of Critical Risks.
- OECD (2013) G20/OECD High-level principles of long term investment financing by Institutional investors
- OECD (2012) Recommendation of the Council for Public Governance of Public-Private Partnerships
- OECD (2012) Recommendation of the Council on Regulatory Policy and Governance
- OECD (2010) Guiding Principles for Open and Inclusive Policy Making
- OECD (2010) Recommendation of the Council on Principles for Transparency and Integrity in Lobbying
- OECD (2007) Recommendation of the Council on Principles for Private Participation in Infrastructure
- OECD (2003) Recommendation of the Council on OECD Guidelines for Managing Conflict of Interest in the Public Service
- OECD (1998) Recommendation of the Council on Improving Ethical Conduct in the Public Service Including Principles for Managing Ethics in the Public Service

## 2. SUMMARY OF THE FRAMEWORK FOR PUBLIC GOVERNANCE AND DELIVERY OF INFRASTRUCTURE

### 2.1. What should a framework for the governance of infrastructure provide?

16. The objective of the framework is to ensure an infrastructure programme that

- makes the **right projects** happen,
- in a **cost-efficient** and
- **affordable** manner, and that
- is **trusted** by users and citizens to take their views into account.

17. The framework is meant to provide decision makers with a methodology to analyse their challenges, mapping out options on how to solve them, and to guide them in carrying through their decisions. The framework consists of three integrated components:

1. A list of governance preconditions. These concern the overall enabling governance environment for infrastructure.
2. A decision tree, which guides countries with respect to making sectoral decisions and overall infrastructure decisions.
3. A checklist, which points governments towards the appropriate modalities that should be used to deliver the infrastructure asset.

### 2.2. Governance preconditions

18. There are certain governance dimensions that need to be in place, regardless of the choice of delivery modality. These can be in place in a multiplicity of organisational and institutional models, and this to a greater or lesser extent. A strong capacity with regards to one pre-condition can to some extent compensate for a weaker capacity in another. However, experience shows that they are mutually reinforcing and must be pursued as a package.

1. A long-term strategic vision for the use of infrastructure, which takes into account the multi-dimensionality of the challenges.
2. Regulatory frameworks, principles and processes should encourage the sustainable and affordable development, management and renewal of infrastructure.
3. The process for managing infrastructure projects over their life-cycle delivery should be user-centric. It should rest on broad based consultations, structured engagement and access to information and have a primary focus on the users' needs.
4. Co-ordination across levels of government and jurisdictions should be frank, regular and performance oriented. Coordination within levels of government should balance whole of government perspectives and sectoral views.
5. The appropriate skills and procedures to ensure rigorous projects assurance, affordability, value for money and transparency should be in place.
6. Project assessments should be based on data and a balanced value for money procedure.
7. Systems should be in place to ensure a focus on the performance of the asset throughout its life.

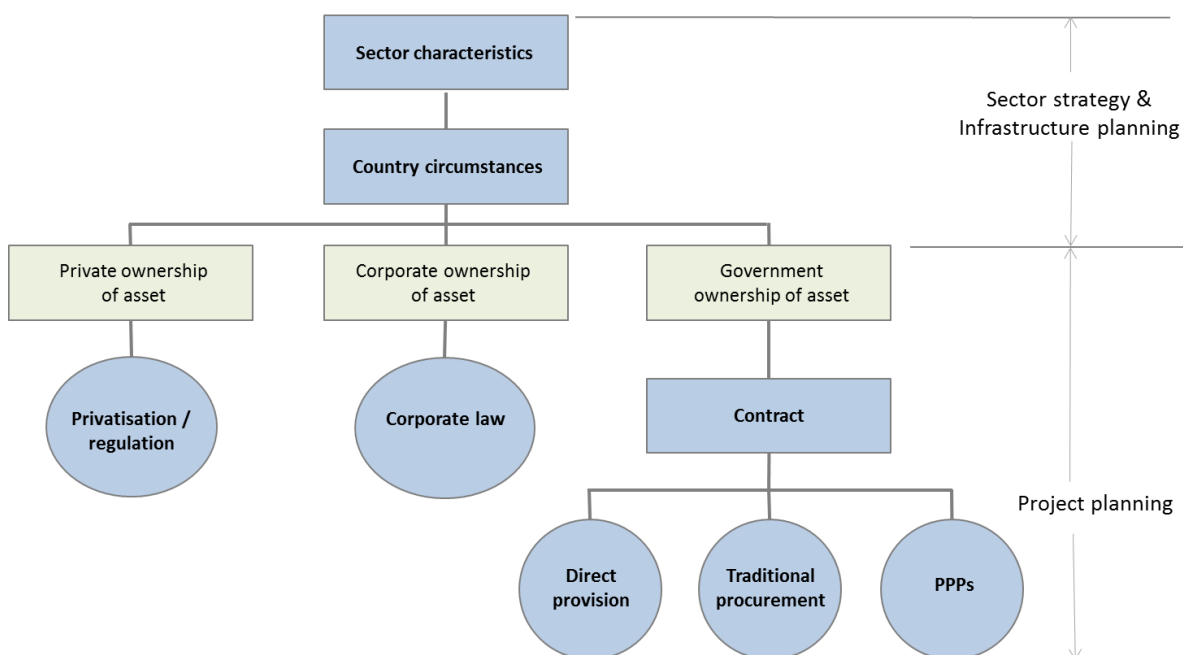
8. Map corruption entry points at each stage of the public infrastructure project and enhance integrity and anti-corruption mechanisms
9. The choice of the appropriate delivery modality should integrate political, sectoral, and strategic aspects.

19. It should be emphasised that oftentimes the good decision will be one where a balance needs to be struck between competing legitimate interests, for e.g.: moving projects forward need to be balanced against a thorough consultation process; providing suitable incentives for private sector participation and risk transfer needs to be balanced against the price for such participation; and regulatory stability needs to be balanced against the need to adjust frameworks in light of developments. In essence these trade-offs require a capacitated public sector and a frank dialogue with all concerned stakeholders.

### 2.3. The infrastructure decision tree

20. The choice of delivery mode for infrastructure provision has important implications for public sector discretionary control, value-for-money and affordability. In many countries, however, the choice of modality is often based on habit and lacks specific criteria both for traditional infrastructure and private finance options (Burger and Hawkesworth, 2011). This decision tree modality choice should be based on specific criteria and should consider the full range of available options. The framework presented in this paper offers a three-step process based on sectoral criteria, country criteria (national/sub-national) and project criteria.

**Figure 2.1 - Decision tree for infrastructure delivery option choice**



21. Please note that for reasons of brevity the above decision tree gives a compressed picture. Many variations of the above exist including situations where the asset is owned by central government or another public authority, but implemented via privatised and regulated industries, state owned enterprises and similar. In addition, the various models are at times combined -- e.g. with an SOE using a PPP/concession like arrangement to deliver infrastructure-derived services. The decision tree and accompanying check lists do not posit that one size fits all. Rather, they seek to raise issues that will be

unique to each country and that will need to be assessed by countries in order to make specific decisions as to how infrastructure can best be delivered.

**2.3.1. Set a preferred sectoral approach by assessing reform objectives and the characteristics of the sector**

22. First, the decision tree suggests that countries assess their sectoral objectives and sectoral characteristics. Considering these together, and prioritising them, should build a solid foundation for determining an optimal sectoral approach to infrastructure delivery.

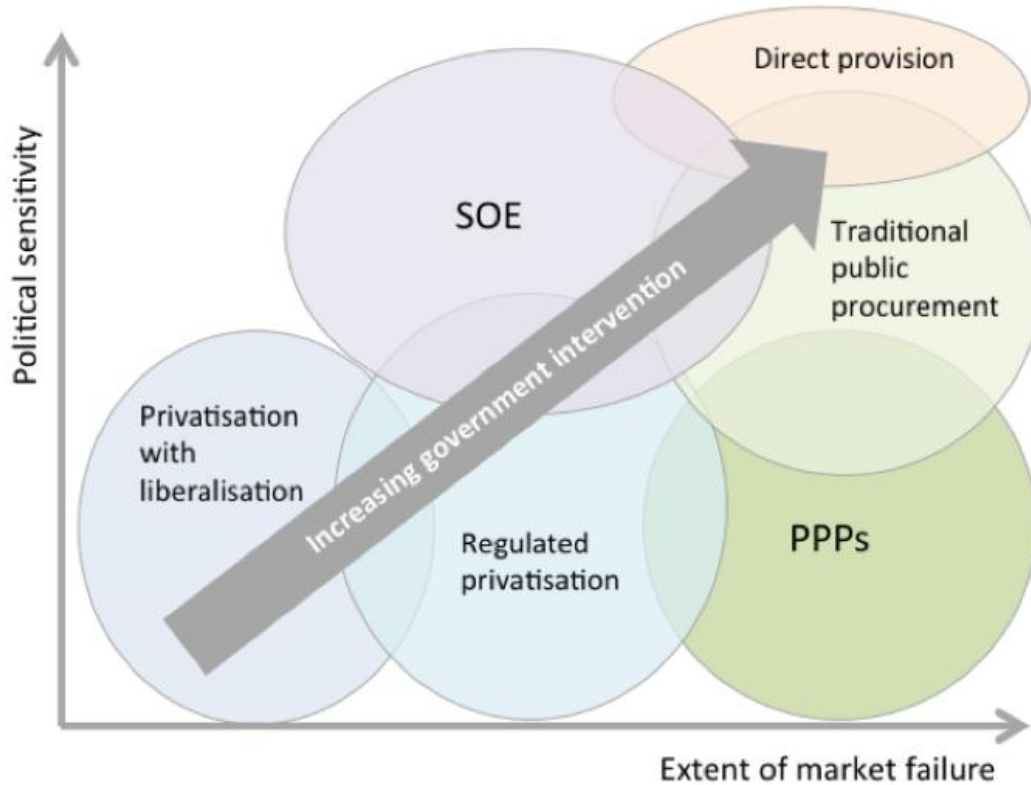
**Table 2.1 -- Objectives and characteristics for determining the optimal sectoral approach**

<b>What are the prioritized sectoral policy objectives?</b>	<b>What characterizes the market and how politically sensitive is the sector?</b>
✓ Improving quality of services	<b>Extent of Market Failures?</b> <ul style="list-style-type: none"> <li>• Potential for competition</li> <li>• Non-excludability</li> <li>• Network effects</li> </ul>
✓ Improving access to infrastructure	
✓ Improving efficiency	
✓ Reducing the need for government subsidies	
✓ Promoting innovation	<b>Political Sensitivity?</b> <ul style="list-style-type: none"> <li>• Equity Considerations</li> <li>• Environmental, land Issues</li> <li>• National Security</li> </ul>
✓ Speed of delivery	
✓ Improving quality of services	
⇓ <b>Optimal sector approach</b>	

23. The choice of modality must take into account the objectives being pursued by policy makers (left column in table 2.1). If, for example, improving efficiency in a particular sector is a key objective, then delivery modes that subject the providers of infrastructure to commercial pressures (PPPs, including concessions), and, where possible, competitive forces (privatisation) should be privileged. On the other hand, it is unlikely that expanding access for a particular public service such as electricity to remote rural areas will generate sufficient returns to justify an investment using purely commercial criteria. Under such circumstances, some form of government intervention is likely to be required, whether in the form of government provision (direct provision or traditional procurement), regulation and/or subsidies (regulated privatisation). Since most infrastructure investments seek to achieve multiple goals - and certain objectives might require different approaches - policymakers should establish a clear prioritisation of objectives before determining an optimal delivery mode.

24. In addition to basing choices regarding infrastructure delivery modes on a clear prioritisation of objectives, policy makers should take into account the specific economic and political characteristics of a sector (right column in table 2.1). A key consideration is the extent of market failure within a particular sector (Figure 2.2). When market failures are significant, and thus impede the formation of price signals that accurately reflect supply and demand, government intervention (through regulation) or government provision (whether in the form of direct provision, traditional procurement, or PPPs) is likely needed in order to avoid under-provision or dominance by a monopolist.

Figure 2.2 - Optimal delivery modes based on political and economic characteristics



25. Many infrastructure-based public services are highly sensitive from a political perspective. The choice of modality must therefore take into account public expectations and values regarding matters such as fundamental rights, equity, the environment, land and national security (Figure 2.2). In some cases it is because they provide what are deemed by society to be ‘essential public services’ such as water or electricity. Access to such services is often considered a fundamental right, and therefore must be subject to greater government oversight and intervention (e.g. through regulation or, in some cases, provision by an SOE) to guarantee equal access for different parts of the population.

26. The identification of the optimal delivery modality should therefore consider the following questions:

- ⇓ What are the policy objectives being pursued in an infrastructure sector and how should they be prioritised?
- ⇓ What is the extent of market failure in a particular infrastructure sector?
- ⇓ What is the level of political sensitivity in a particular infrastructure sector?

**2.3.2. Assess how the country circumstances impact the sector**

27. Second, the country’s circumstances must be taken into account. A sector analysis applying the criteria described above should help to determine what is the most economically efficient and politically acceptable mode of delivery for a particular infrastructure category. However, this analysis ignores the fact that achieving economic efficiency in the real world depends on having in place an appropriate set of functioning economic institutions, among other things. What is economically efficient in theory might be less so in practice if a country’s circumstances are ill-adapted to a particular mode of delivery. For example, for the privatisation of infrastructure to be successful, there must be sufficient capacity in the private sector to deliver the infrastructure and create a credible threat of entry, as well as strong and independent regulatory institutions to ensure that private firms do not gain excessive market power to the

detriment of consumers and taxpayers. If these conditions are not in place, privatisation carries the risk of degenerating into a private monopoly that lowers welfare.

**Table 2.2 - Country circumstances**

<b>Dimension</b>	<b>Components</b>
Political economy	<ul style="list-style-type: none"> <li>• Distribution of the political resources within an economy?</li> </ul>
Government's capacities	<ul style="list-style-type: none"> <li>• Public sector capacity for implementation, regulation, and monitoring?</li> </ul>
Private sector's capacities	<ul style="list-style-type: none"> <li>• Skills and abilities, the degree to which the market is competitive, whether there is a level playing field between incumbents and new-comers, including those from abroad?</li> </ul>
The enabling legal environment	<ul style="list-style-type: none"> <li>• Clear and prudent legislation?</li> <li>• Dispute resolution mechanisms?</li> <li>• Legal enforcement?</li> </ul>

28. Thus, choices relating to sector approaches and delivery modes for infrastructure should be filtered by a consideration of a country's political economy, its institutions, the capabilities of both the government and private sector, and its openness to foreign investment. If the gap between a country's circumstances and the requirement of a particular mode of delivery are too far apart, then pursuing that modality is sure to lead to failure. Governments then have the choice of pursuing the "second best option", which might not be the most economically efficient solution in theory but carries a higher likelihood of delivering value for money and improving welfare.

29. By integrating these aspects into the optimal sector approach it should be possible for the decision maker to arrive at a "fit for purpose approach" marrying the theoretical with the possible.

**2.3.3. Choose a delivery model based on the project characteristics and overall approach**

30. Third, once a sector strategy has been decided, the focus of planning and decision-making shifts down to the project level. Governments will exert a greater degree of influence over sectors that are characterised by forms of market failure (e.g. natural monopolies, negative externalities) and a high degree of political sensitivity, but there are a number of ways to exert such control and it may vary from project to project, even within sectors. The determination of who owns the asset will rest on a number of priorities, usually tied to the overall sectoral strategy as discussed above..

31. The type of ownership will influence the options for how the project can be delivered as illustrated in the decision tree (Figure 2.1.). If greater efficiency is the objective, privatisation or some form of corporate model will be appropriate if a market is present. If no market is present, government ownership will oftentimes be a more obvious choice, but various regulated models may also be relevant within a given political context.



32. Achieving value for money will depend on selecting the mode of delivery that achieves the best value for money by delivering the desired outcomes at the lowest possible cost, while still being aligned with the relevant ‘fit for purpose approach’. The issues that should be considered are:

- ⇓ **The size and financing profile of the investment** -- e.g. a large initial investment followed by significant operating and maintenance needs could indicate advantages to bundle the construction, operation and maintenance of the assets in a single contract.
- ⇓ **The potential for cost recovery from users or land value capture** -- e.g. for investments in sectors that have a non-excludable nature, user fees will not be practicable and the project will need to be funded via government spending
- ⇓ **The extent to which quality is contractible** -- e.g. when quality is difficult to specify and monitor, then contracts are likely to be costly and time consuming to develop, and will be highly vulnerable to renegotiation.
- ⇓ **The level of uncertainty** -- e.g. many of the most catastrophic infrastructure investments are the result of poor assumptions, often made worse by excessive optimism (Flyvberg 2014). In sectors where change is highly unpredictable (e.g. where technology is in flux), preferred modes of delivery should be adaptable, not locked.
- ⇓ **The ability to identify, assess and allocate risk appropriately** -- e.g. are we sure which parties should carry what risks? (see also Box 2.1).

33. This framework does not provide cook-book answers for determining how to deliver an infrastructure asset that performs a public service. Indeed, in reality the decisions mapped out in the decision tree will take place in an iterative fashion where policy objectives, political economy and facts on the ground will inform each other. The above discussion thus seeks to raise issues that will be necessarily unique to countries and put them into more general lessons learnt in OECD Member countries, e.g. about when PPPs work and when they don't. The framework should enable countries to take a fresh look at their infrastructure governance and delivery framework and identify where more work could add value.

### **Box 2.1 - Check list for investigating relevant delivery mode**

#### *Project size and profile*

- Large initial capital outlay and long payback period?
- Is the project large enough to justify the additional legal, technical and financial costs of a PPP?
- Can quality enhancements in the design and construction phase generate savings during the operating phase of the project?
- Do these savings justify the additional transaction costs involved in bundling construction, operation and maintenance in a single contract?

#### *Revenues and usage*

- Can user fees be charged, are they affordable for the majority of users, and are they politically acceptable?
- Are user fees sufficient to cover the majority of capital and operating costs?
- Can usage be monitored?

#### *Quality*

- Can the quantity and quality of project inputs be specified and measured efficiently?
- Will design innovation be required to achieve improvements in efficiency and value-for-money?

#### *Uncertainty*

- What is the level of uncertainty relating to future technological or societal conditions?

#### *Risks*

- How are risks allocated?
- Is demand relatively predictable over the lifetime of the project?
- Who is best placed to influence demand for the infrastructure-based service?
- Is the private sector willing to and capable of bearing some or all of the demand risk?
- Are there particular integrity risks in terms of corruption and undue influence that merit attention?

See Appendix 2 for more specifics.

Note: This box should not be interpreted to be either for or against increased public provision or private sector participation in infrastructure delivery. It is offered as a guide to key questions and indicates possible relevant experiences from OECD countries to reflect on. It attempts to compress the experience of countries and practitioners into an overall check-list format of key issues. There will therefore be cases, countries and sectors where the experiences are not sufficiently reflected in the above.

### **3. WHAT ARE THE MAIN GOVERNANCE CHALLENGES TO INFRASTRUCTURE?**

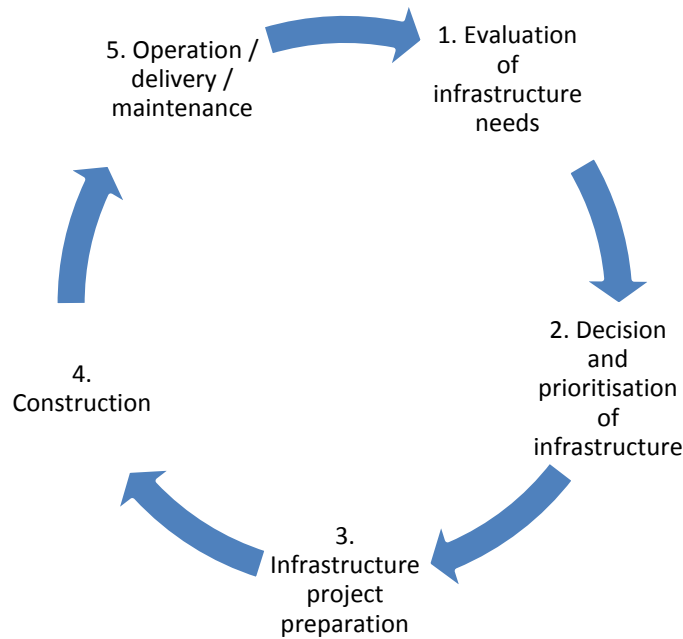
34. A lack of good governance for infrastructure projects often result in cost overruns, delays, underperformance, underutilisation, accelerated deterioration due to poor maintenance, corruption and, occasionally, in white elephants and bridges-to-nowhere. It is therefore the responsibility of policymakers and infrastructure planners to make the most efficient use of limited financial resources and prioritise the often conflicting concerns of various stakeholders. In addition, the decision maker must choose the optimal mode of delivery, ensuring the effective use of private sector participation when feasible.

35. Based on the on-going work of the OECD (see Box 1.2) and the results of the High Level Focus Group of infrastructure leaders on the 29 January 2015 the OECD has identified a number of governance challenges that countries face. While there are other challenges that projects face -- notably those of a technical nature -- the challenges discussed here have to do with the decision trade-offs and issues that are the result of the machinery of government meeting the particular characteristics of infrastructure planning, implementation and management. The section concludes with a list of governance 'pre-conditions' for good infrastructure governance which evidence suggests are necessary for the right projects to go ahead and bad projects being stopped.

#### **3.1. Infrastructure governance challenges**

36. As an introduction to the governance challenges it is helpful to bear in mind the various stages of infrastructure and how they interact with the governance dimension as illustrated in Figure 3.1. below. In the figure, the five phases in the life cycle of an infrastructure asset project are identified; each of these relate to separate governance challenges. First, there is the issue of evaluating the infrastructure needs. This requires the ability to gather evidence to identify the relevant needs across sectors and regions. Second, a prioritisation of these needs should take place based on planning, processes and tools that allow an aggregation of the many project dimensions and preferences of stakeholders. Third, in the project preparation phase, suitable procedures and skills in terms of technical design, affordability and value for money issues need to be applied. Fourth, in the construction phase appropriate skills and systems should be available to ensure that project assumptions are delivered upon or that changes are subject to appropriate scrutiny. Fifth, in the operational stage of the project the right incentives and tools for appropriate monitoring of asset performance and maintenance should be in place as well as mechanisms for to reflect on the service provided. The governance challenges discussed below to varying extent cut across the life cycle of the asset, but will usually play a fundamental role at a particular time of the asset.

**Figure 3.1 - Infrastructure governance cycle**



**3.1.1. *Weak capacity for designing a strategic vision for infrastructure undermines the development of a sustainable development plan***

37. A necessary condition for a successful infrastructure programme is appropriate strategic planning. This requires identifying what investment should be undertaken, determining the essential components, needs and trade-offs, and how they should be prioritised. Conversely, weak or insufficient planning often impedes their successful implementation and operation later in the project cycle. The reason why designing a clear and coherent strategic vision is difficult stems essentially from the complex nature of infrastructure investment.

- Infrastructure investment has many stakeholders. The infrastructure brief cuts across different institutions, policy areas and professional disciplines which makes it difficult to aggregate into a coherent view. This is compounded by the fact that the necessary analysis tends to be done in silos reflecting the various stakeholders.
- Infrastructure development serves multiple objectives, with multiple policy goals such as growth, affordability, inclusive development, environmental objectives, potentially being in opposition.
- Good infrastructure requires identification of necessary complementarities across sectors. For example, investments in housing need to be complemented by the right investment in transport networks. Such complementarities and trade-offs need to be constructed and combined into integrated strategies taking into consideration the regional and local actors (OECD, 2011).
- Lessons from the water sector are illustrative in that respect: in many countries, the sector sorely lacks appropriate strategic financial planning OECD (2009).<sup>1</sup> The identification and

<sup>1</sup> See the OECD Water Governance reviews of Mexico, Jordan and Tunisia ([www.oecd.org/gov/regional-policy/country-reviews-on-water-governance.htm](http://www.oecd.org/gov/regional-policy/country-reviews-on-water-governance.htm)) and OECD water work in Eastern Europe, the Caucasus and

prioritisation of projects is often made based solely on political considerations, without considering relevant objective needs and the clear financing constraints associated with the projects. In contrast, OECD (2011) shows that appropriate financial planning contributes to the success of water policy reform in that such planning: “... can stimulate a policy debate on the feasibility of certain choices of policy orientation and targets (thereby helping to phase out unsustainable policies and practices), lower the costs of water policies (by appropriate targeting, sizing, and investment sequencing), and generate additional financial resources (by attracting attention of donors and financiers).”

38. A key element in generating a coherent strategy is thus designing a process that allows for the many relevant policy and sectoral elements to be included. In essence a process that manages to distil complex and multi-faceted problems with a multiplicity of actors into a coherent set of decisions.

39. An example of such a process is the United Kingdom’s National Infrastructure Plan. In response to the issues raised above the UK developed a National Infrastructure Plan in 2010 that sets out the challenges facing UK infrastructure and the government’s strategy for meeting the infrastructure needs. The plan contains the major commitments for investment in important infrastructure projects. In addition, the government puts out a national infrastructure pipeline paper with more specific information on the projects. The pipeline amounts to a portfolio of GBP 370 billion in 2014 and covers both projects that will rely on public and private finance (with public support, e.g. nuclear energy). The purpose of the plan is to: i) Present a global government vision, ii) to lay out the strategic need for investment in the UK, iii) to create transparency about the project pipeline and priority investments in order to assure the business side that there is an ongoing market, iv) to ensure delivery progress by measuring and publishing reports on developments. The list covers projects at variable stage of realisation -- form budgeted, planned to potential.

40. The investment plan is generated on the basis of departments transmitting their plans and wishes to HM Treasury’s Strategy team, which filters and compiles the list. The actual government prioritisation of projects, however, takes place using two main tools: the ‘Top 40’ list of projects/infrastructure programmes and the budget. The Top 40 list of projects has been developed in an iterative process with the line Departments, HM Treasury and the Cabinet office. The projects are chosen based on a number of criteria that essentially focus on political priority and overall value to society. The Top 40 list is finally endorsed by the Cabinet and is subject to consistent review by a Cabinet Committee in order to ensure continuous political attention and focus on to the projects moving forward. Resources for project implementation are allocated via the ordinary annual budgeting process -- a key decision point where the lenses of planning and fiscal affordability are brought together. The overall affordability of the project portfolio is assured by keeping it within the government’s medium term fiscal plan.

41. Many countries have processes similar to the example above. It can be difficult to identify, however, when such a process is an actual strategic planning tool and when it is more a paper exercise. The proof must invariably be whether the right projects have been developed, a judgment that can probably only be made in hindsight.

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Central Asia [OECD (2009), Strategic Financial Planning for Water Supply and Sanitation, a Report from the OECD Task Team on Sustainable Financing to ensure affordable Access to Water Supply and Sanitation].

### ***3.1.2. Infrastructure impacts communities - without well managed consultation good projects may falter***

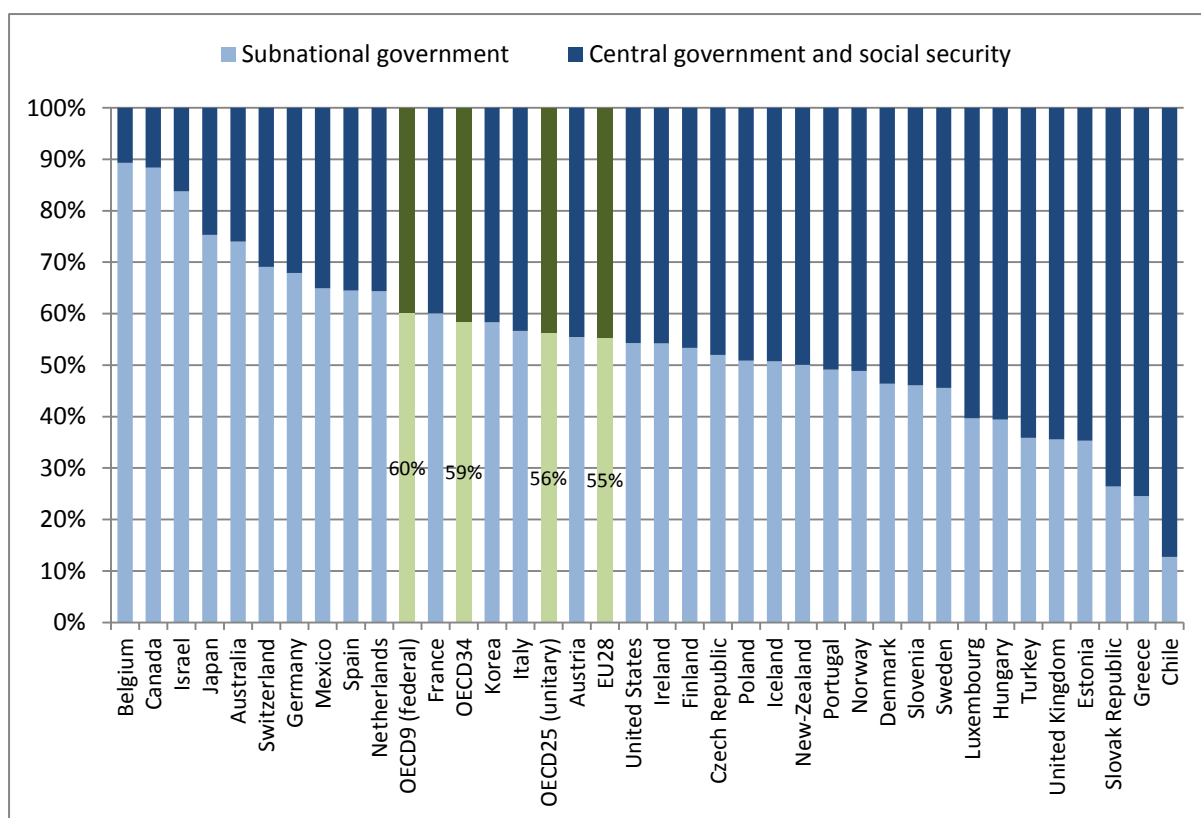
42. Involving stakeholders such as users, civil society organisations and the private sector, can improve the quality of planning efforts and ultimately the effectiveness of the asset. Stakeholder involvement can establish a shared vision for development, improve the assessment of investment needs, reveal the importance of cross-border linkages, strengthen trust in government and cultivate support for specific investment projects. It can also lead to demand-driven improvements in public investment management capacity. In practical terms, this means that both central and sub-national governments should have the capacity to engage in processes of stakeholder involvement in policy development and needs assessment in the early stages of the investment cycle, and feedback and evaluation in later stages (OECD, 2014). Capacities for effective stakeholder involvement include issues such as identifying stakeholders, understanding their “stake”, designing outreach opportunities and managing grievances. Data from surveyed regions suggest that involvement in investment planning could be bolstered among certain groups of stakeholders. In most regions, consulting municipalities for the elaboration of a regional development strategy is common practice. However, involving citizens, academics and NGOs in the design of regional investment strategies is less common, and banks and private actors are the least involved in the design of these strategies. Since 2007, each of the five regions in Denmark are required to appoint at least one Regional Growth Forum to guide regional business development strategies and the use of associated regional and EU Structural Funds. By law, the 20-member public-private boards include regional and municipal elected officials, business persons, representatives of the higher education and research community, and trade unions. Members are appointed by the Regional Council upon recommendation by the municipalities and social partners. They meet four to six times a year and are supported by the regional administration.

43. Private sector actors can play different roles at different stages of the public investment cycle, but risks of capture by specific interest groups need to be managed. In many regions, the private sector is involved in the design of public investment in their region, especially in the transport and environment sectors, and to a lesser extent, in innovation and regional development. In some regions, the private sector is involved in investment projects related to hospitals, schools, information and communication technology (ICT) infrastructure, and culture. As stakeholders in public investment decisions, private actors can contribute important information to regional development planning and the implementation of investment strategies. However, capture can be an issue, particularly where firms prioritise the creation of future markets for themselves rather than the best strategies for the particular region. Once private contracts have been awarded, the implementing private actor can also contribute to strategies for communicating and consulting with the public. Public authorities can encourage them to adopt a high degree of transparency, provide comprehensive information regarding the project’s parameters and the state of infrastructure operations, and actively engage around the environmental and social impacts of their activities (OECD, 2007). One example of that is the Frankfurt Airport extension. The decision to build a new runway at Frankfurt Airport (Germany’s largest airport) was accompanied by a mediation process initiated by the state government of Hesse. It had the goal of reconciling concerns about noise and other environmental effects with the economic case for the new runway. The process was initiated prior to the decision to build the runway and included extensive consultations with proponents and opponents of the new runway. Most recommendations made by the mediators were implemented in the planning process. After the end of the mediation process, a regional forum continued to the dialogue between stakeholders until the planning process for the new runway was completed and construction started.

### 3.1.3. The co-ordination challenge - a multiplicity of actors across levels of government may derail good projects

44. Public investment is generally a shared responsibility across levels of government. Whether through shared policy competencies or joint funding arrangements, public investment typically involves different levels of government at some stage of the investment process. This makes its governance particularly complex. Sub-national governments, defined as states, regions and other municipalities, undertook 72% of total public investment in 2013 across the OECD area in terms of volume. Variations across countries are important, as sub-national public investment ranges from 13% in Chile to 88% in Canada (2013). A large part of public investment spent on infrastructure.

Figure 3.2 - Sub-national share of country's public investment



Source: Sub-national governments in OECD countries: key data (2015)

45. Effective public investment across levels of government not only requires substantial co-ordination to bridge information, policy or fiscal gaps that may occur, but it also calls for critical governance capacities at different levels to design and implement public investment projects (OECD, 2013). Such challenges are also similar if not greater in developing countries, where public investment (particularly green field investment) accounts for a higher share of GDP and institutional frameworks are less mature than in developed countries.

46. Governing the complex interactions across levels of government for public investment holds important potential for improving efficiency and effectiveness, and hence investment outcomes (OECD, 2013). Collaboration for public investment strategies across jurisdictions and levels of government is difficult, even in situations where the actors involved clearly recognise the need for it. Transaction costs,

competitive pressures, resource constraints, differing priorities and fears that the distribution of costs or benefits from co-operation will be one-sided, can all impede efforts to bring governments together. The constellation of actors involved in public investment is large and their interests may not be aligned: there are oftentimes different levels of government involved, central ministries, line ministries, regulatory agencies, state owned enterprises, citizens and users etc. A lack of co-ordination may lead to sub-optimal outcomes or projects being derailed (OECD, 2014).

47. Leadership from above can be needed to resolve the collective problems that such co-operation poses. The national government in particular holds a key strategic role in convening investment priorities, strengthening capacities of different levels of government involved in managing public investment, and ensuring sound framework conditions for governing public investment.

48. All countries are confronted by these challenges, whatever the institutional context (in federal countries, or highly centralised countries) given the mutual dependency across levels of government. The *Recommendation of the Council on Effective Public Investment Across Levels of Government* adopted in 2014 targets the systematic obstacles that countries, regions and cities face when managing public investment, notably challenges in vertical and horizontal co-ordination, across sectors, and bottlenecks in sub-national capacities.

49. Mechanisms used for vertical co-ordination between central and sub-national levels of government in OECD Member countries range from informal policy exchange platforms to co-financing arrangements for shared responsibilities or conditionality requirements for receiving central funds (OECD, 2013). Cross-governmental investment policy forums can help overcome information and policy asymmetries. However, they must be backed by real resources and linked to real decision-making processes, to avoid becoming ineffective “talking shops”. Co-financing mechanisms enable risk-sharing and policy alignment, especially in a fiscally constrained environment. They need to be adapted to sub-national governments’ constraints and should encourage innovative sources of financing. Conditions attached to funding can enhance systematic assessments of investment impacts and can clarify roles and accountability, thereby reducing the incidence of “bad” investments. To be effective, conditions must be designed to foster trust and partnership rather than simply to enforce compliance (OECD, 2013).

50. In an attempt to bridge both the co-ordination and the capacity gaps, a number of central governments, and large states in federated countries such as Canada and Australia, have also been creating dedicated infrastructure units close to, or within, central ministries such as the Ministry of Finance or the office of the chief executive. Australia for example has set up a body called Infrastructure Australia, which aims to improve whole-of-government infrastructure co-ordination. The central government created an advisory body, Infrastructure Australia (IA), to co-ordinate with the states for investments of national importance. The body was established in 2008 to advise the central government on investment priorities in the transport, communication, water and energy sectors and to help states identify infrastructure projects that are a national priority. IA assesses the states’ applications for funding under the Building Australia Fund (BAF), the Commonwealth’s main mechanism to finance critical infrastructure projects (OECD, 2015/Toolkit). IA is responsible, among other things, for setting national public-private partnership policies and guidelines. Infrastructure Australia replaced an inter-governmental National PPP Forum established in 2004. Chile extensively uses Ministerial Committees and Advisory Boards as a way to enhance vertical and horizontal co-ordination in different areas.

51. Australia also put in place the Council of Australian Governments (COAG), to discuss intergovernmental issues in general, but which also plays an important role in infrastructure development. It is composed of the Australian Prime Minister as its chair, State Premiers, Territory Chief Ministers and the President of the Australian Local Government Association. Through COAG, the federal and sub-national governments have endorsed national guidelines on public-private partnerships, agreed to a



national port strategy, and concluded intergovernmental agreements on heavy vehicles, rail and maritime safety. COAG also receives regular reports from Infrastructure Australia (OECD, 2015/Toolkit).

52. Countries and sub-national governments are increasingly acknowledging that the multiplicity of actors involved and lack of co-ordination mechanisms may generate suboptimal infrastructure outcomes due to potential inadequate scale of investment, overlap of projects and alignment of priorities across levels of government. (OECD 2015, Toolkit to have more examples in this field: <http://www.oecd.org/effective-public-investment-toolkit/>).

#### **3.1.4. *The skills challenge with respect to the life cycle of infrastructure***

53. The Australian Productivity Commission notes the need to retain sufficiently skilled public sector employees to be responsible and accountable for performing a range of actions along the life cycle of infrastructure. Infrastructure investment requires a multiplicity of skills to assess, procure, manage and regulate that may not be sufficiently available in the relevant public sector organisation. Apart from certain sectors (such as transport) that have an on-going infrastructure programme, many projects are unique for the concerned authority and/or unique for the country as a whole (e.g. mega projects like the Olympics, very large fixed links, airports). They may also be new in the way they are financed (e.g. private finance) or be subject to technological change that requires new skills.

54. There are important challenges at both national and sub-national level to catalyse sufficient regulatory capacity to oversee the performance of infrastructure service delivery. Regulatory delivery (the downstream of the regulatory policy cycle) is in particular perceived as the weak link. Recent OECD work on the governance of water regulators (OECD 2015) highlights that “The establishment of a water regulator is generally justified on the basis of protecting the public interest as part of a reform process that aims to make service providers more accountable, to establish an independent price-setting process and to harness regulatory expertise in the public sector.” Countries are thus well aware of these challenges. Some have responded by skill enhancing sectoral units, regulators, and streamlined the role and availability of specialised advisors. Others have set up dedicated units, especially in the field of PPPs but increasingly with a broader remit of infrastructure in general.

55. The rationale for a dedicated unit for infrastructure and/or PPP can be many and varied, but they are all in response to a capacity gap. Arguments include the pooling of the relatively limited infrastructure expertise, making sophisticated tools available, standardisation of procurement procedures, applying appropriate due diligence considerations thoroughly and demonstrating political commitment to the infrastructure effort. The shape such a unit or units takes depends on a combination of factors including the types of pre-existing institution in place, the composition of the national infrastructure programme, as well as the political commitment of the government. The cases of Korea and South Africa highlight some of the different rationales for establishing a dedicated unit. Korea established the Private Infrastructure Investment Centre of Korea (PICKO) in 1998 under the Act on Private Participation in Infrastructure. In 2005, PICKO was merged with the Public Investment Management Centre to create Public and Private Infrastructure Investment Management Centre or PIMAC, which is currently in operation. The establishment of the Centre was seen as part of the government’s response to three major concerns: a lack of expertise within government to develop and evaluate public-private partnerships; a lack of transparency and use of excessively complicated procedures, unattractive risk sharing arrangements and insufficient incentives which detracted from the interest of private partners and a general softening of infrastructure investment in the aftermath of the 1997 East Asian Financial Crisis. South Africa’s National Treasury PPP Unit was established in 2000 to filter fiscally irresponsible projects while maintaining investor confidence in the government’s public-private partnership programme. The creation of the PPP Unit followed Treasury’s concerns over a specific project, a 30-year build-operate-transfer contract for two prisons proposed by the Ministry of Public Works. In considering intervening and establishing a precedent of

arbitrary intervention in public-private partnerships by the National Treasury, it was decided to create a dedicated unit (OECD, 2010).

56. Another case is found in the UK. The main institutional hub for infrastructure in the UK is HM Treasury's Infrastructure UK (IUK). Infrastructure UK (IUK) was created in a separate Division as part of HM Treasury in 2011, building on the former executive agency Partnerships UK (PUK). Its responsibilities extend beyond those of a PPP unit, as it is the UK's government's core infrastructure hub. IUK's objective is to provide greater clarity and co-ordination over the planning, prioritisation and enabling of investment in UK infrastructure, and to improve delivery of UK infrastructure through achieving greater value for money. Like PUK, IUK's supports major, centrally-funded infrastructure projects, including private finance Initiative projects, through technical and policy advice to HM Treasury and line Departments. It has a key role in providing support to HM Treasury and the Major Projects Authority (MPA) during the approval process of projects. Additionally:

- It issues guidance tools and policy notes, such as the new guidance on private finance projects and the now obsolete Public Sector Comparator quantitative tool.
- It is responsible for developing the UK's new National Infrastructure Plan and bringing projects under the plan to fruition, with a focus on the Top 40 list.
- It acts as a central repository for information about the stock and flow of all infrastructure projects that receive central government funding in the United Kingdom.
- Finally, IUK co-ordinates efforts among various other public stakeholders that are responsible for PFI projects in England, Northern Ireland, Scotland, and Wales.

### **Box 3.1 - Sub-national dedicated PPP units in federal states**

The jurisdiction of dedicated PPP units may span the national level, the sub-national level or both---the latter requiring further co-ordination where their functions are parallel or sequential to one another. Typically the jurisdiction of such units reflects the structure and delineation of powers between levels of government. Among unitary states that have a dedicated PPP unit, it is located at the level of the central government.

Among the four federal states with a dedicated PPP unit (*i.e.* Australia, Belgium, Canada and Germany) the location of such a unit varies. In Australia, Canada and Germany, a dedicated PPP unit is located at both the state/province and federal levels. In each case, however, it was the state/provinces that first established dedicated PPP units (though not all states/provinces have done so) with the federal government establishing a unit during the last year. In Belgium, a dedicated unit has only been established in one of the county's three regions (*i.e.* Flanders and not Brussels or Wallonia).

In Australia, each state and territory has appointed a lead government agency to implement public-private partnership policies. Only three state/territory government—New South Wales, South Australia and Victoria—have established a dedicated unit. Other states and territory governments—*i.e.* Tasmania, Western Australia, Australian Capital Territory, Northern Territory—do not have a dedicated PPP unit and place responsibility within their finance ministry more generally.

At a national level, Infrastructure Australia was established as an independent agency in 2008 to set national public-private partnership policy and guidelines. The agency is located under the portfolio of the Federal Minister for Infrastructure, Transportation, Regional Development and Local Government. Infrastructure Australia replaced an inter-governmental National PPP Forum established in 2004 to support a more unified national approach to public-private partnerships.

In Canada, three provinces have established a dedicated unit—Partnerships British Columbia, Infrastructure Ontario, and Public-Private Partnerships Québec (state/provincial level). At the federal level, Infrastructure Canada was set up as a separate department under the Transport, Infrastructure and Communities portfolio in August 2002.

In Germany, a number of federal states have also established their own dedicated PPP units since 2001 to support government organisations to procure and manage public-private partnerships projects. Federal states may also draw upon the services of Partnerships Germany, the independent PPP unit. Connecting the units at the federal state level, a federal expertise network (*Föderales PPP Kompetenznetzwerk*) exists between the federal government, federal states and municipalities and help to facilitate reciprocal vertical and horizontal knowledge transfers.

57. At the sub-national level, government capacities also vary greatly across metropolitan areas and rural jurisdictions. Where the capacities to design and implement investment policies and projects are weak, policies may fail to achieve their objectives (OECD, 2013, OECD 2014c). Recent research has shown that public investment and growth outcomes are correlated to the quality of government, including at the sub-national level (OECD, 2013). Several studies considering quality of government have explored the links between quality of government, public investment impact and regional growth and have concluded that there is a positive relationship (OECD, 2013). This is notably the case for EU structural funds, the main source of investment funding throughout the European Union. Recent empirical research has shown that higher levels of institutional quality at the sub-national level are associated with greater effectiveness of EU funds. (Rodrigues Posé et al, 2012). It is thus critical to identify the governance capacities that are required for subnational governments to better manage investment.

**3.1.5. *Uncertainty with regards to revenue flows and sources through the life cycle of the asset can result in a lack of confidence in the project's affordability***

58. Financial sustainability over the long run can be an important challenge to a number of infrastructure sectors that to a greater or lesser extent rely on user charges - in particular water, energy and to some extent transport. The water sector is emblematic in that respect. OECD work highlights the critical importance of the three ultimate sources of funding for the sector (3Ts: Taxes, Tariffs and Transfers). In most countries, low cost recovery through user fees is coupled with strong reliance on budget subsidies (OECD 2009 and 2011). However, subsidies are renewed on an annual basis and their reliability is therefore not ensured. In the current context of strong budget constraints, subsidies tend to be reduced and the long term financial sustainability of the systems and the services is therefore not ensured all other things being equal.

59. Tariff regulation is a critical determinant of the revenue flow in infrastructure sectors. Evidence shows that tariff setting and updating is a very difficult task in both OECD and non-OECD countries and tends to be a highly political endeavour, in particular in the water sector<sup>2</sup>. To remedy the situation and situate tariff setting at arm's length from political interests, a number of countries have chosen to make tariff regulation a key function of independent regulators and to issue tariff methodology (OECD, 2015). A number of critical issues remain unresolved, however. These include: how to provide the relevant incentives for investment, how to price capital and account for depreciation to ensure that any tariff policy achieves the objective of long term sustainability of the sector at the least costs for the customers (while addressing the monopolistic behaviour of the operators).

60. Tariffs alone will oftentimes not be sufficient to cover the investments need. Public funding remains an essential element of infrastructure financing. For projects that are wholly government funded both in the construction and operational phases the revenue source is clearly the ordinary budget. However, there are examples of countries simply overinvesting and finding themselves in a position where there is simply insufficient general revenue to pay for the functioning of the asset, such as was found in Portugal with respect to certain PPPs after 2008.

61. For projects that rely on some form of private participation. The uncertainty and risks with regards to revenue flows primarily impacts a project when private counterparties are asked to carry some of this risk and require a commensurate risk-adjusted compensation. In addition, a private investor may insist on some form of minimum revenue guarantee to invest at all, which brings risks back on the governments balance sheet.

62. There is no easy solution to the fact that there will often be uncertainties with respect to revenue due to both the nature of the particular project and its interface with the dynamics of the public sector. It is the responsibility of the decision-maker to put in place governance arrangements that manage, mitigate and make transparent these risks and uncertainties to the extent possible.

**3.1.6. *Infrastructure decisions tend to be bound by administrative perimeters rather than relevant functional economic ones***

63. Strategic planning challenges are amplified by the fact that jurisdictions need to be co-ordinated at the relevant scale, to avoid over or under-provision of public goods. Investing at the relevant "functional" socio-economic scale requires co-ordination across jurisdictions to increase efficiency through

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<sup>2</sup> See the OECD Water Governance reviews of Mexico, Jordan and Tunisia ([www.oecd.org/gov/regional-policy/country-reviews-on-water-governance.htm](http://www.oecd.org/gov/regional-policy/country-reviews-on-water-governance.htm)).

economies of scale and affordability of the asset for users and government (OECD 2014c). This is particularly true for metropolitan areas. This can be complex to achieve for political reasons, and there are numerous examples of bad infrastructure decisions linked to inadequate perimeters of investment.

64. The small scale of public investment projects in countries with high levels of administrative fragmentation can result in lower returns on that public investment, and ultimately poor service delivery to citizens (OECD 2015a). A good example to illustrate this is transport infrastructure in metropolitan areas. There are ten different transport authorities in the metropolitan area of Aix-Marseille in France, reflecting the fragmented administrative perimeter of the area, which has resulted in an overall supply of public transport that falls short of people's needs (OECD, 2013b): only 2% of the population living in the metropolitan area of Aix-Marseille for example has *high* access to transport (OECD, 2013). Public transport failures also reduce inhabitants' mobility and limit the *de facto* perimeter of their potential job market, thus contributing to heightening inequalities with regard to access to employment (OECD, 2013).

### ***3.1.7. The lack of data and evidence on service delivery performance makes it difficult to use assessment tools well***

65. Countries should carefully assess which investment modality is likely to yield the most value for money, but it can be a challenging task. Good practice requires the use of a comprehensive cost benefit techniques and a robust assurance process.

66. Most countries use some kind of numerical value analysis when choosing whether to pursue a particular investment as well as which modality to use (e.g. PPP vs. traditional infrastructure procurement). For the latter a Public Sector Comparator (PSC) has been used in a number of countries. A PSC is a hypothetical risk adjusted reference project using a 'traditional' form of infrastructure procurement. However, experience shows that numerical value for money tests must be treated with caution. Indeed, such value for money calculation should not be perceived as a 'pass or fail' test. It is meant to be an element in a careful case that a line department should build in order to choose the appropriate investment strategy. Such exercises can be vulnerable to a degree to manipulation of data to achieve a preferred outcome and tend to over-focus attention on the numerical result of the exercise, rather than a more full set of considerations.

67. The fundamental element that enhances the solidity of any kind of value for money test is data. Unfortunately, there is a lack of systematic data-collection regarding the cost and performance of infrastructure assets across various modalities. While many countries do collect data, most of the data that would be required to compare the overall costs of projects financed through various alternative mechanisms is not systematically collected, processed or made available.

68. This lack of collection and systematic publication of data also impedes effective monitoring of the asset's performance. It could be argued that it results in less accountability in the infrastructure sector than what is the case in e.g. the health or education sectors. The use of key performance indicators to oversee the performance of infrastructure service delivery is, however, rapidly developing and proving a strong tool to monitor and benchmark the performance of infrastructure in their delivery phase. They contribute to the building of the evidence that can support better policy and decision making in the infrastructure. They also are a critical component of ensuring better performance of utilities. However, the experience of developing key performance indicators in the water sector shows the difficulty in agreeing

on a common methodology for key performance indicators and the capacity needed both on the regulators' part and the utilities' part to provide meaningful quality information that inform the key processes.<sup>3</sup>

### **Box 3.2 - Assessing value-for-money in proposed public-private partnership projects**

Prior to undertaking a public-private partnership a government should explore whether a public-private partnership will deliver better value-for-money compared to traditional public procurement. Generally speaking, four methods may be used to assess the relative value-for-money of the different delivery models:

- a complete cost benefits analysis of all alternative provisions methods available to both the government and private sector -- this method is the most complex among the four presented here;
- calculation of a public sector comparator before the bidding process to assess whether a public-private partnerships in general offers better value for money (e.g. South Africa); and
- calculation of a public sector comparator after the bidding process to assess whether a particular public-private partnerships bid offers better value for money (e.g. Victoria (Australia)); and
- the use of competitive bidding process alone without a comparison between public and private provision methods (e.g. France).

Partnerships Victoria uses a public sector comparator to compare the net present cost of bids for the public-private partnership project against the most efficient form of delivery according to the output specification (a so-called reference project). The comparator takes into account the risks that are transferable to a probable private party, and those risks that will be retained by the government. Thus, the public sector comparator serves as a hypothetical risk-adjusted cost of public delivery of the output specification of a Partnerships Victoria project. The methodology for preparing the public sector comparator is published by Partnerships Victoria.

Some have contested the robustness of the public sector comparator citing that it is constantly manipulated in favour of public-private partnerships. The United Kingdom has, for example, replaced the public sector comparator to incorporate quantitative and qualitative factors. Quantitative factors include a reference project, value-for-money, affordability benchmarks. Qualitative factors include project visibility, desirability and achievability (Wall and Connolly, 2009).

69. This lack of data collection also impedes systematic ex-post learning, although some Supreme Audit Institutions (SAI) are addressing this gap. Ideally the SAI would audit and assess individual projects, and perhaps the infrastructure programme in general, ex post with regards to performance, finance and compliance. If that is the ambition, it needs capacity to give a clear verdict on whether or not the project ultimately represented value for money, suggest possible improvements to the regulatory framework, the procurement processes and make available overall lessons regarding the use of infrastructure modalities. Some countries have done a lot of work in this respect (e.g. France and the United States), usually on particular projects rather than from a more infrastructure programme basis. For example, the UK National Audit Office has performed and published close to one hundred reviews of individual private finance infrastructure projects. Most countries do conduct some form of performance/value for money audit (OECD, 2007), although data is not available on how many of these are on infrastructure.

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<sup>3</sup> See the experience of OFWAT in the UK in establishing KPI (in OECD (2013), Making Water Reform Happen in Mexico and the heterogeneity in KPI in OECD (2015), The Governance of Water Regulators).

### ***3.1.8. Adverse incentives provided by regulatory frameworks may generate suboptimal investment choices***

70. It is a well-known fact that at times projects may be prioritised or cancelled for the wrong reasons. Motivations might include the wish to capitalise on an existing subsidy, jurisdictional boundaries, the need to show decisiveness, response to special interest groups. It is also true that decision makers, donors and investors often prefer to invest in Greenfield projects that will be seen as a tangible achievement, versus maintenance and renovation projects, that are less visible.

71. One way to overcome such issues is to set up procedures that assess cost efficiency and value for money such as cost-benefits analysis, ex-post evaluation and audits that are transparently communicated. Institutionalised and manage stakeholders' engagement. Such procedures may also help transmit the actual needs and possible inappropriate investment design to decision makers.

72. The technical set up of the budgeting system may in itself also impact infrastructure. In OECD Member countries, public expenditure for infrastructure allocated via the annual budget process is transparently accounted for. However, many countries operate on a cash accounting basis with only a limited use of a public sector balance sheet -- so the state of the public sector assets are not reported. In many countries the consequences have been that public infrastructure assets are badly maintained, shortening their effective life span, with a lack of clarity as to the infrastructure stock; and that investment needs may erupt suddenly, derailing medium- and longer-term fiscal planning. Countries have responded to this challenge in a number of ways: using the private sector to a greater extent, changing budgeting and accounting systems to accrual accounting, and putting in place a systematic upgrade of infrastructure management.

73. Accounting rules have meant that some countries are tempted to choose particular procurement modalities as a way of off-budget borrowing. The use of PPPs, SOEs or other vehicles has at times been driven by a wish to finance the asset in a non-transparent manner, off the government's balance sheet, rather than being a choice grounded in a wish for more cost efficiency. A motivation for such behaviour has been to "buy now, pay later" and in order to get around fiscal rules on government's debt and deficits. Experience also shows that some cost-efficiency problems might surface in regulated areas, stemming from principal-agent problems, gold-plating and regulatory capture.

### ***3.1.9. Unstable or burdensome regulatory and institutional framework can also prevent long-term decisions hereby undermining sound decision-making from both public and private actors***

74. Instability of institutions in charge of infrastructure development and management as well as frequent change in the regulatory framework will increase the sense of risk and arbitrary decisions for project developers. Moreover, in a number of jurisdictions, infrastructure projects may be subject to multiple layers of regulatory requirements that may be perceived as overly burdensome or comfort the feeling of unpredictability of investors. In addition to rule of law and established conflict regulation mechanisms, countries need to endeavour to maintain a stable and transparent regulatory regime with a clear allocation of roles between regulatory institutions responsible for infrastructure investment and develop a credible and predictable pipeline of projects. This need for certainty should naturally to be balanced against the legitimate need for flexibility and political will. A one-stop shop for infrastructure project development procedures may help investors navigate better in the bureaucracy of a specific jurisdiction and provide better certainty. In a number of countries, independent regulatory bodies have been established to catalyse regulatory expertise in the public sector that oversees economic regulation of infrastructure service delivery. Their success at restoring trust in regulatory decisions and ensuring the credibility of the regulatory frameworks will critically depend on their governance, including role clarity, adequate processes and structure to manage human and financial resources, independence, accountability,

performance evaluation and funding as defined in the OECD Best Practice Principles on the Governance of Regulators.

### ***3.1.10. Infrastructure procurement is vulnerable to corruption***

75. Corruption allegations often surround government-led mega projects on infrastructure. The extent of public officials' discretion on the investment decision, the size of the projects and the multiplicity of stages and stakeholders involved make them more prone to corruption. The OECD Foreign Bribery Report identified that two-third of foreign bribery cases occurred in 4 sectors highly related to infrastructure; extractive (19%), construction (15%), transport and storage (15%) and information and communication (10%).

76. Assessing the scale of corruption in public investment is a challenge because corruption usually leaves no paper trail. However, several studies have tried to quantify the amount of money lost due to corruption. It has been estimated that 10-30% of the investment in a publicly funded construction project may be lost through mismanagement and corruption (COST, 2011). According to another estimation, "annual losses in global construction through mismanagement, inefficiency and corruption could reach USD 2.5 trillion by 2020" (COST, 2012) and within the European Union, corruption costs EUR 120 billion per year (European Commission, 2014).

77. Corruption in the different phases of an infrastructure project can involve a wide range of actors including elected and non-elected public officials, lobbyists, civil society organisations, trade unions, regulators, contractors, engineers and suppliers. In addition, corruption at different phases can take place in a wide variety of ways, such as undue influence or capture of the investment by specific interests, or bribery in the procurement process.

78. For instance, public investments are perceived in many countries to be politically driven. Politicians have tendencies to prefer new infrastructure projects rather than maintenance and repairs of the old ones in order to increase their visibility. By doing so, it opens entry points for political corruption in this process which can directly lead to failing trust in the government. Enhancing transparency and public participation can contribute to ensuring that the process is carried out based on policy priorities that the public officials are fulfilling its responsibility to serve the public interest.

79. Furthermore, most infrastructure projects are implemented using public procurement or private-public partnerships. Those engaged in corrupt practices often try to recover the cost that they have incurred through practices such as fraudulent billing, collusion, bid rigging, agreement to share the market or future contracts, price-gouging, use of inferior quality goods or setting higher prices of the services. A sound public procurement process is essential to ensure not only that practices for awarding contracts are competitive but also that the quality of goods and services is adequate.

80. If the public investment is proven to be carried out with transparency, integrity and proper management of public funds, they can become a flagship case for the government to showcase good governance, particularly in cases of low trust and would reinforce government efforts to curb corruption. *The OECD Checklist to Curb Corruption in Public Investment (forthcoming)* assists governments to mitigate corruption risks in public investment by identifying corruption entry points over the entire investment cycle and provides real life guidance on how to prevent corruption.

### ***3.1.11. Political and business cycles issues strongly impact the phases of infrastructure***

81. It is difficult to reconcile the short term vs. long term challenges at stake. Infrastructure involves long-term agenda and needs predictability but infrastructure is extremely sensitive to political and economic/business cycles.



82. The local public investment cycle is for example highly correlated to the local election cycle: usually, the level of public investment rises the year that precedes municipal elections, and then declines the first years that follow the election. In the case of France, public FBCF rises by 5.9% on average the year that precedes the election, and declines by 0.5% just after the election, and 1.4% the year after (INSEE, [http://insee.maquettes.cndp.fr/invest/qui/qui\\_adm\\_pub\\_locales.htm](http://insee.maquettes.cndp.fr/invest/qui/qui_adm_pub_locales.htm))

83. Public investment is also highly sensitive to the economic cycle: it was for example used as the adjustment variable by many governments in the fiscal consolidation period that followed the crisis.

### ***3.1.12. Identifying, pricing and allocating risks between public and private parties can be difficult***

84. A number of countries attempt to use more complex procurement methodologies (e.g. PPPs) in their infrastructure programs as a way to allocate more risks in a more efficient and effective way. In some cases this approach fails to take into consideration that increased risks need to be matched by increased reward. Consequently a lot of projects founder due to a misalignment between what private sector partners will accept in terms of risk and what some public sector entities hope for. Approaches that just look at risk reduction and cost management from a government perspective are therefore unlikely to result in sustainable solutions. As the project grantor, it befalls the public sector to design projects that only transfer those risks to the private side which it is better able to manage than the public side (see box 2.2.). Experiences from countries show that this may oftentimes entail transferring less risk than was originally thought. Countries should not attempt to use the private sector to mitigate problems that essentially stem from flawed governance. For instance, the private sector will usually be less suited to overcome land and right-of-way issues than the public side. While this risk can be off loaded to the private side, it will not be cost efficient. The use of more innovative risk-sharing arrangements therefore require that both public and private sector are able to identify, measure and allocate risks between them in a fair manner where the appropriate reward follows the allocation of risk.

### Box 3.3 - The transfer of risks

As risks should be carried by those that manage them best. The key aspect to PPPs is thus identifying and sharing the risks between private and public partners. Three categories of risks, listed in the table below, can be identified: macroeconomic, commercial and legal/ political risks. Risks are events that can be measured and the probability for its occurrence assigned. Risks vary in nature, some of them are endogenous (controllable by a party to a meaningful extent) and some others exogenous, uncontrollable, to at least some of the parties, but measurable.

Risk	Agent	Types of Risk		
		Macroeconomic	Commercial	Legal and Political
External/ Exogenous	Private	Aggregate Demand	Force majeure	Different Investment preferences of alternating governments
		Interest rate risk	Demand risk	Expansionary anti-crises policies raising the cost of financing
		Liquidity risk		Risk of expropriation
		Exchange rate risk		
	Public	Aggregate Demand	Force majeure	
		Interest rate risk		
		Liquidity risk		
		Exchange rate risk		
Project specific/ Endogenous	Private		<b>Project risk</b>	
			Design and construction risk	
			Operation	
			Maintenance	
			Input and output quality and quantity risk	
			Residual value risk	
			Contractor failure risk	
			Renegotiation risk	
			Early termination risk	
			Security risk	
			Technology risk	
			Idiosyncratic interest rate	
			Idiosyncratic liquidity risk	
			<b>Credit risk</b>	
		of the SPV		
		of the constructing and operating		
	of the financial institution			
Public		sovereign risk		Different Investment preferences of alternating governments
		Demand risk		Expansionary anti-crises policies raising the cost of financing
				Risk of expropriation

As a general rule parties are better at managing those risks which are endogenous to them. However, it is difficult to determine a clear list of which risks should be borne by whom as this will often depend on an assessment of the concrete case. Legal/political risks are typically exogenous to the private partner but endogenous to the public partner and therefore are probably better managed by the public side. Macroeconomic risks are exogenous to both private and public partners, but the former could be expected to carry the normal business cycle movements. Demand risk is a type of risk that can be both exogenous and endogenous for the public sector depending on whether the demand is based on end users' preferences or whether it is based on public sector consumption.

### **3.2. Infrastructure solutions -- Governance preconditions**

85. What the above discussion amounts to is that there are certain governance capacities that need to be in place, regardless of the choice of delivery mode, if projects are to represent value for money, be affordable and transparently treated. There are certain governance dimensions that need to be in place, regardless of the choice of delivery modality. These can be in place in a multiplicity of organisational and institutional models, and to a greater or lesser extent. A strong capacity with regards to one pre-condition can to some extent compensate for a weaker capacity in another. However, experience shows that they are mutually reinforcing and must be pursued as a package.

1. A long term strategic vision for the use of infrastructure that takes into account the multi-dimensionality of the challenges.
2. Regulatory frameworks, principles and processes should encourage the sustainable and affordable development, management and renewal of infrastructure.
3. The process for managing infrastructure projects over their life-cycle delivery should be user-centric. It should rest on broad based consultations, structured engagement and access to information and have a primary focus on the users' needs.
4. Co-ordination across levels of government and jurisdictions should be frank, regular and performance oriented. Coordination within levels of government should balance whole of government perspectives and sectoral views.
5. The appropriate skills and procedures to ensure rigorous projects assurance, affordability, value for money and transparency should be in place.
6. Project assessments should be based on a data and a balanced value for money procedure.
7. Systems should be in place that ensure a focus on the performance of the asset throughout its life.
8. Map corruption entry points at each stage of the public infrastructure project and enhance integrity and anti-corruption mechanisms
9. The choice of the appropriate delivery modality should integrate political, sectoral, and strategic aspects.

86. It should be emphasised that oftentimes the good decision will be one where a balance needs to be struck between competing legitimate interests, for e.g.: moving projects forward need to be balanced against a thorough consultation process; providing suitable incentives for private sector participation and risk transfer needs to be balanced against the price for such participation; and regulatory stability needs to be balanced against the need to adjust frameworks in light of developments. In essence these trade-offs require a capacitated public sector and a frank dialogue with all concerned stakeholders.

## 4. SELECTING THE INFRASTRUCTURE DELIVERY MODE -- THE DECISION TREE

### 4.1. The decision framework

87. The choice of delivery option for infrastructure provision has important implications for value-for-money and affordability. Unfortunately, in many countries, the decision is not sufficiently formalised and left too late in the project planning process.

88. Current infrastructure planning processes typically rely on traditional public procurement as the default option and occasionally consider PPPs as an alternative. Moreover, decisions on whether to pursue a PPP are often ad hoc and the criteria may not always be formalised (Burger and Hawkesworth, 2011).

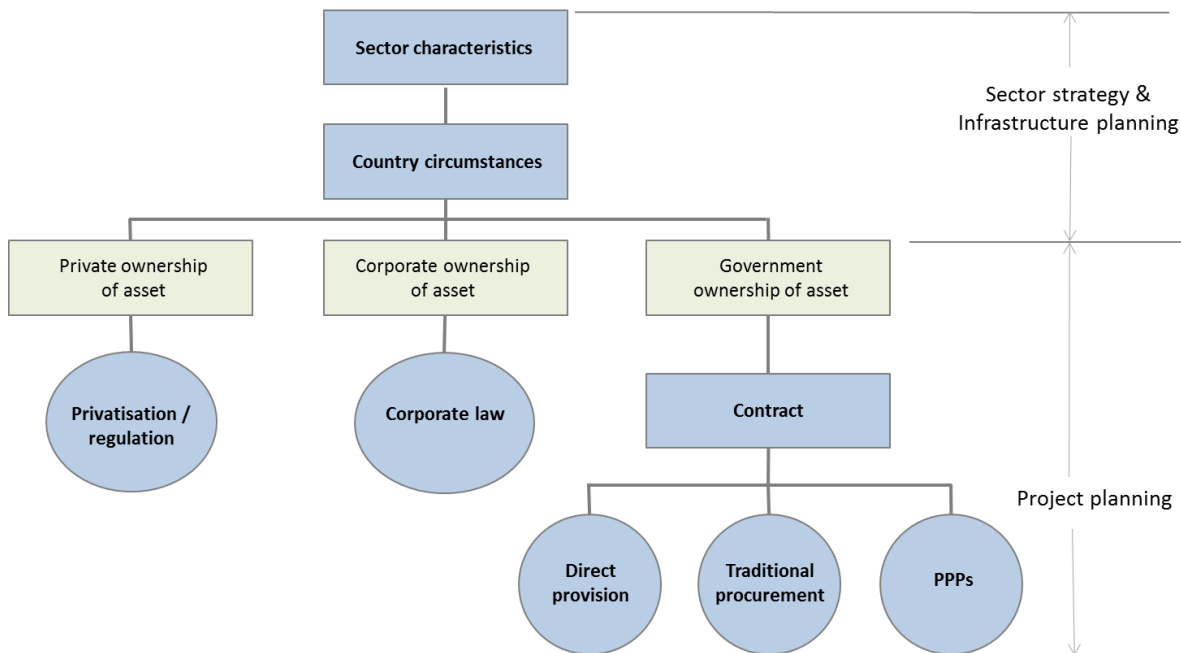
89. However, as highlighted earlier, these delivery modes are not the only options. If value-for-money is to be achieved policymakers and planners need to consider the full range of delivery options available. In order to do so, questions relating to modes of infrastructure provision must not only be addressed in the project planning phase -- when the range of available options is more narrowly circumscribed - but early in the infrastructure planning process when infrastructure needs and priorities are being determined on a sectoral basis. In order to limit the scope for arbitrary choices by officials, the decision should be governed by a set of formal criteria.

90. The decision framework should focus initially on prioritising the various objectives that should govern infrastructure investment decisions in a particular sector. These objectives should be derived from policy goals, and are critical for defining value-for-money.

91. Once objectives have been made explicit and prioritised, the analysis then shifts to determining the optimal delivery mechanism for infrastructure in a particular sector taking into account the economic characteristics of the sector and its level of political sensitivity (Figure 4.1). Key questions to be addressed at this stage include *by whom* and *how* should infrastructure investment decisions be made. For example, if privatisation is deemed to be the optimal approach then the government relinquishes its control over project selection to private firms.

92. This optimal choice of modality should then be filtered by country circumstances including the country's political economy, its institutions, the competences and capacities of government (including sub-national governments), the capabilities available in the private sector, and the openness to foreign investment. The choice of provision mode must also take into account the "starting-point" of the country and the level of adaptation required to implement a particular mode. This level of analysis yields a choice of sector modality that is "fit-for-purpose" in view of the sector characteristics and the country's circumstances.

**Figure 4.1 - Decision tree for infrastructure delivery options**



Please note that for reasons of brevity the above decision tree gives a compressed picture. Many variations of the above exist including situations where the asset is owned by central government or another public authority, but implemented via privatised and regulated industries, state owned enterprises and similar. In addition, the various models are at times combined -- e.g. with an SOE using a PPP/concession like arrangement to deliver infrastructure-derived services. The decision tree and accompanying check lists do not posit that one size fits all. Rather, they seek to raise issues that will be unique to each country and that will need to be assessed by countries in order to make specific decisions as to how infrastructure can best be delivered.

93. When the government retains its role of planner and thus the responsibility for project selection, it then needs to determine the appropriate delivery mechanism for specific projects. The range of options narrows to project mechanisms such as direct provision, traditional public procurement or various forms of PPPs. The assessment of the different options should: take place early in the project planning process, preferably at the prefeasibility stage; be based on a formal set of project-level criteria; and should treat each option on an equal basis. The output of this project-level analysis is an appropriate project modality that is based on the specific features of the project such as its size and profile, sources of funding, the extent to which quality is contractible, the level of uncertainty and the allocation of risks.

#### **4.2. Determining a sector approach**

94. A key consideration in the development of a sector strategy is determining the extent to which the government will wish/need to influence investment levels. At one extreme, governments may relinquish decisions relating to investment to private firms, particularly in sectors where prices are determined by markets and there is a reasonable level of competition among suppliers. However, in the presence of market failures, prices will not reflect real supply-demand conditions leading to underinvestment by private firms. Under such circumstances, governments may seek to exert influence over investment levels to ensure adequate provision of important infrastructure goods. Governments may also seek to exert influence for political reasons because a particular sector has implications for welfare (as in the case of water and electricity).

95. Government influence over investment can take the form of direct control whereby the government has the ownership of the asset. This involves exercising direct control on decisions relating to

investments and specific projects, as in the case of traditional public procurement or PPPs. Governments can reduce their involvement by allowing private or corporatised SOEs to effectively take control of specific projects, all the while maintaining their influence over the investment through regulation or board control of SOEs. Finally, governments may completely relinquish their influence over investment in a sector through empowering private firms to own the asset and make all decisions relating to investment needs (Figure 4.2). *In fine*, the overall investment decision rests generally with the government based on sectoral objectives, and is influenced by factors such as the economic characteristics of the sector and its political sensitivity.

#### **4.2.1. Sector objectives**

96. Decisions regarding investment strategies at both the sector and project level must be framed by an assessment of national/regional development goals and sector objectives (see Figure 4.3.). Moreover, since some objectives might be mutually exclusive, policymakers should also establish a clear prioritisation of objectives ahead of making decisions regarding sectors (also examining potential complementarities and trade-offs), projects and delivery modes. For example, a goal of providing universal access might not be consistent with another goal of achieving rapid roll-out of infrastructure. The following are some of the objectives that often shape sector strategies and influence decisions relating to choices of delivery modes.

##### *Improving quality of services*

97. Decisions to invest in new infrastructure or to use an alternate delivery mode are regularly driven by considerations of service quality. Privatisations of water and telecommunications sectors were often motivated by the objective of improving on what was all too commonly a very poor quality of service delivered by a state-owned enterprise. For example, prior to privatisation of the telecommunications sector, the average waiting time for a new phone line in Chile in 1993 was 416 days. Following privatisation, this dropped to 6 days in 2001 (Fischer et al, 2003).

##### *Improving access to infrastructure*

98. Across many parts of the developing world, millions of people are still without access to electricity, water and sanitation. A major motivation for infrastructure investment across developing countries in particular is therefore improving access to such basic services. Even in developed economies providing equitable access to essential infrastructure services irrespective of income levels or location can be an important objective for policymakers. Furthermore disparities across regions or across metropolitan vs rural areas (very high even in OECD Member countries) are sometimes higher within countries than across countries.

##### *Improving efficiency*

99. A key role of policy is providing high quality public services at the lowest possible cost to society. Efficiency considerations are thus often at the heart of decisions regarding infrastructure investment and modes of delivery. It is estimated that inefficiencies such as overemployment, poor bill collection, system losses, and irregular maintenance practices by SOEs in infrastructure markets cost about USD 12 billion annually in Africa (Rosenstock and Trebilcock, 2013).

##### *Reducing the need for government subsidies*

100. Many infrastructure sectors, even when they depend on user fees as a major source of funding (such as in the case of public transport systems), also rely on government subsidies in order to cover costs and ensure that service remains affordable for the majority of users. Inefficiencies in the delivery of

services can thus be a heavy drain on government finances. The need to reduce the cost of providing a service can therefore be a major motivation for considering alternative delivery modes for infrastructure.

#### *Promoting innovation*

101. Ensuring that a particular public service continues to provide value-for-money over time, requires infrastructure providers to adapt to evolutions in business models and technology. The capacity to innovate and develop new solutions can be an important consideration in the choice of modality, and one of the motivations for pursuing private sector involvement. The choice of delivery option may also be shaped by a broader public sector reform process that seeks to streamline government, and promote innovation in service delivery.

#### *Speed of delivery*

102. Infrastructure only begins having an impact once it is operational (setting aside the macroeconomic stimulus resulting from large construction projects). Governments may therefore consider speed of delivery for an infrastructure project as an important objective that should inform decisions relating to mode of delivery and choice of provider.

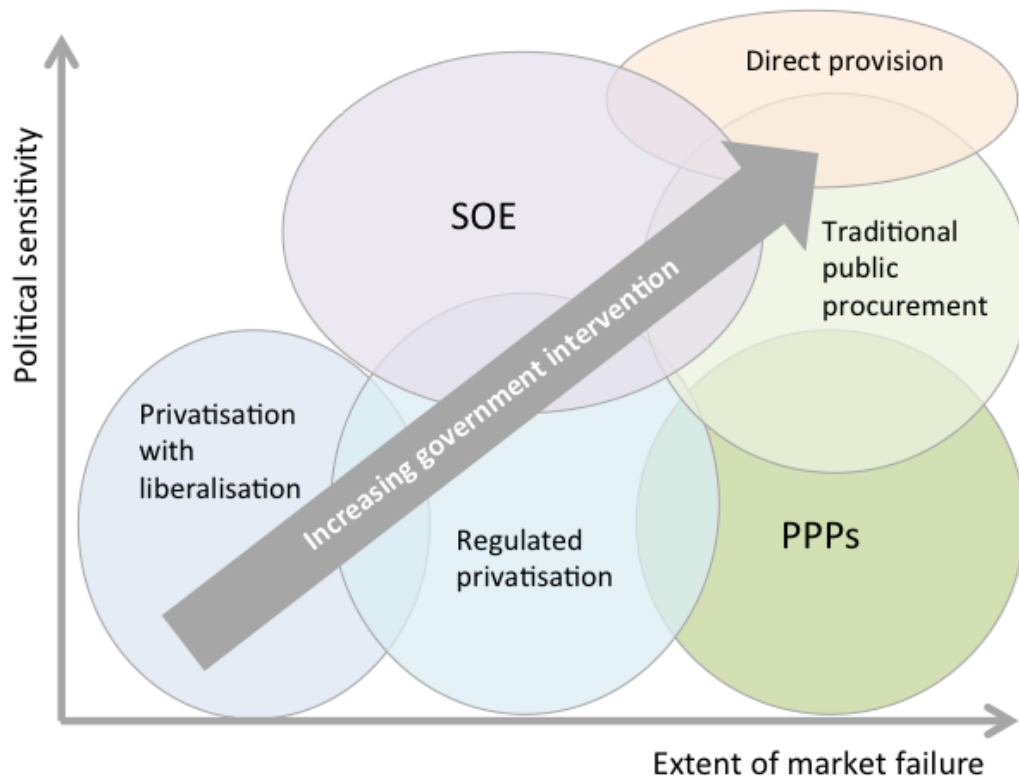
#### **4.2.2. Sector economic and political characteristics**

103. The appropriate role for government in providing infrastructure and the optimal choice of delivery mode depend on a sector's economic and political characteristics. The need for government intervention should be dictated primarily by the extent of market failures in a sector. However, a degree of government intervention may also be necessary due to public expectations and the political sensitivity of certain sectors (Figure 4.2).

#### *Extent of market failures*

104. In sectors with multiple buyers and the potential for competition in the market (multiple suppliers and the threat of entry) price signals may serve as accurate indicators of demand and supply. When such market-based prices exist for a particular infrastructure good, the most efficient mode of provision is by private firms operating in a competitive environment. Competitive forces ensure that consumers do not overpay and price signals help guide firms' investment decisions. Under such circumstances, privatisation combined with effective competition policy would be the optimal mode of delivery. A number of infrastructure sectors in advanced economies such as electricity utilities and telecommunications exhibit such market-based pricing and are largely privatised.

Figure 4.2 - Optimal delivery modes based on political and economic characteristics



105. In economies where conditions for market-based pricing do not exist *a priori* (e.g. because a sector has features of a natural monopoly or is dominated by a single state-owned enterprise), prices will need to be regulated and will therefore not serve as a good guide for investment decisions. In such cases, privatisation may not be to the benefit of consumers, and may even carry significant risks of creating a private monopolist. Responses might include price and output regulation, vertical unbundling (separating retail, wholesale and production operations), or provision by the government (through an SOE, PPPs or directly). Regardless of the specific approach taken, governments will play an important role in terms of influencing investment levels in the sector (either through setting prices or selecting projects), and either providing financing directly or creating incentives for private finance.

106. The extent to which prices reflect supply and demand will depend on a range of factors including the potential for competition, the ability to exclude non-paying users, and network effects.

**Potential for competition**

107. End-users may benefit from the efficiencies generated by competition when a particular infrastructure good can be provided by multiple providers. When multiple providers offer an identical good simultaneously, competition is said to be "in the market". Under such circumstances the most efficient solution, and the one which will provide the greatest social benefit, is private provision by multiple independent firms. However, a competitive market does not occur naturally since private firms will seek to create monopoly conditions for themselves. Competition therefore has to be policed and enforced in order to create the conditions for a free market.

108. Furthermore, there are circumstances where it may be more efficient for a single provider to service the entire market. Such "natural monopolies" occur in sectors characterised by high capital costs



and economies of scale. Left to their own devices, firms can exploit their dominant position as monopolists to charge high prices and provide a poorer quality service.

109. When competition "in the market" is not possible because a sector has features of a natural monopoly, privatisation may not offer the most efficient solution. Governments may nevertheless promote better outcomes for end-users by organising competition "for the market". Firms will bid to be the 'natural monopolist', and, if the auction is designed appropriately, they will relinquish some of their monopoly rents to the benefit of consumers or taxpayers. However, for such an approach to be successful it is essential that there is a sufficient number of qualified bidders in order to organise a truly competitive auction. Moreover, in order to retain as much bargaining power as possible once a contract has been awarded, governments should ensure that a credible threat of entry exists in the event of non-performance of the successful bidder.

110. Most vertically integrated infrastructure sectors contain a mixture of both market and natural monopoly elements. For example, in the electricity sector, the transmission and distribution system fits most closely with a natural monopoly given the cost and challenges a competitor would face in seeking to duplicate it. Governments are therefore more likely to maintain public ownership of transmission assets, or, as a minimum, ensure strong regulation of access costs and conditions. However, in-market competition may be feasible in the generation and retail aspects of the business, in which case, governments might allow for free entry and exit of private firms. A strategy for delivering infrastructure in a particular sector may therefore involve a combination of approaches applied to different components of the sector's value chain. Privatisation should therefore be contingent on the structural separation of businesses in order to prise away those segments where there is a strong potential for in-market competition. The *Recommendation of the Council concerning Structural Separation in Regulated Industries* provides guidance on this matter.

### **Non-excludability**

111. A determining feature of public goods is their non-excludability, i.e. economic actors cannot be excluded from consuming the good. Goods that are non-excludable are typically under-provided when the provider is a private firm since payment for their use is voluntary. For this reason, goods that have an important social value, but are non-excludable are often, though not always, provided by the government.

112. A number of infrastructure sectors exhibit non-excludability to varying degrees. Street lighting is a classic example of a non-excludable public good since any passer-by or motorist will benefit from the presence of street lights. National defence infrastructure such as military bases is considered a non-excludable public good which benefits all citizens of a nation. Road networks, with the exception of toll roads, are also traditionally non-excludable (though this may be changing since developments in technology are increasingly making it feasible to charge individual motorists for their road usage). On the other hand, infrastructure sectors such as ports and airports are clearly excludable.

113. A number of infrastructure goods are technically excludable, but because of their importance for human well-being, may be treated as non-excludable. In many countries, social infrastructure such as healthcare and education are considered to be a basic right to all citizens and are therefore non-excludable.

114. In cases where an infrastructure good is non-excludable for either technical or social reasons, the government will need to provide the service itself or create the appropriate incentives for private firms to do so.

## **Network effects**

115. Network effects reflect the change in value to a service with the participation of other users. When an increase in the number of users makes a service more valuable, as in the case of a social network, it generates positive network externalities. However, negative network externalities, often referred to as congestion effects, exist when additional users make a product less valuable for existing users. Traffic congestion is a common problem in road and rail transport. Congestion effects may also occur in telecommunications systems when the amount of data flows exceeds the bandwidth of the system leading to declining system performance.

116. Complex systems featuring a high-level of interdependencies may also contain chokepoints or be vulnerable to systemic failure whereby a localised fault may cause the failure of an entire system. When multiple users or service providers share a common infrastructure platform with limited capacity, the owner or regulator of the platform must manage or regulate usage to limit congestion effects and the risk of systemic failure. Infrastructure that is vulnerable to congestion effects and systemic failure with the potential for widespread impact may require some form of government intervention, such as direct control through ownership, or regulation (e.g. congestion charging) (de Mello and Sutherland, 2014).

### **4.2.3. Political sensitivity**

#### *Equity considerations*

117. Many infrastructure goods such as water and electricity, as well as social infrastructure such health and education, are fundamental for human welfare and inclusive development. Access to such infrastructure is often viewed as a basic right in many countries and therefore carries considerable sensitivity. As a consequence, irrespective of the identity of the provider, ultimate responsibility for the service is perceived by the public at large to lie with the government.

118. Moreover, because all members of a population, regardless of income or location, are viewed as equally entitled to such infrastructure, considerations of equity are often at the heart of decisions around the provision of such infrastructure. Markets do not always provide equitable access to groups that are less able to pay for a service or that are more costly to supply because of their geographic location. The greater the importance attached to a particular infrastructure service, the more likely it is that governments will be perceived as the "provider of last resort". Under such circumstances governments will seek to exert influence either through direct provision, regulation, subsidies to increase affordability, or public service obligations.

#### *Land issues*

119. A feature of many infrastructure investments is the importance of land access and ownership issues to project development." A number of infrastructure sectors, including road and rail networks, transmission lines, and wind farms, are highly "land-intensive". Being able to acquire rights to land at an acceptable cost and without undue delays is therefore critical to the success of a project. For example, a new rail line may require the acquisition of a continuous land corridor extending hundreds of kilometres. However, land is a finite resource and subject to numerous competing claims. Moreover, large infrastructure projects may have broader impact on communities and ecosystems through creating obstacles that impede rights of way, alter a landscape, or impact land used for agriculture or hunting. For example, the construction of a large dam may require the relocation of entire communities. Land issues can be further complicated in countries where indigenous communities have an ancestral claim to land and where property rights may not be formally assigned.

120. Given the sensitive nature of land, government intervention is essential to facilitating access to land for projects, compensating landowners and communities, and mediating disputes between developers, owners, and local communities. Governments' role in land planning cannot be delegated to the private sector with the result that government participation is often essential for infrastructure investments to go ahead and for project implementation to proceed smoothly.

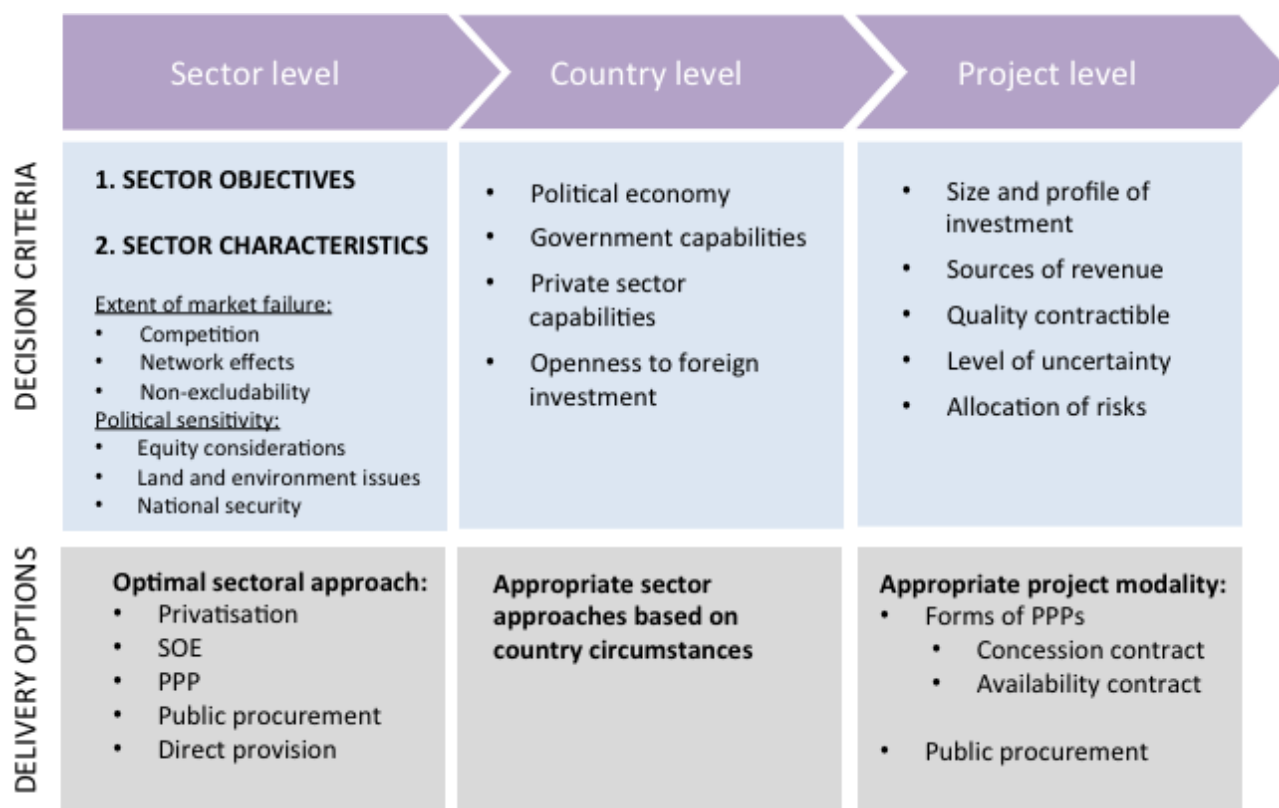
*Environment and health*

121. Large-scale infrastructure projects may also have significant environmental and health impacts that require government intervention: communities living near highways may be exposed to high levels of air pollution and noise; large hydroelectric dams may have significant effects on natural ecosystems; oil and gas pipelines carry the risk of major accidents and spills with widespread implications for affected communities and the natural environment; aviation is responsible for a significant amount of carbon emissions. When infrastructure has the potential to generate negative externalities, governments will need to intervene in order to minimise them and ensure that costs are internalised to the greatest extent possible.

*National security*

122. Certain categories of infrastructure that have national security implications, such as military installations, might be too sensitive to "outsource" to private firms. In such cases, governments are often directly responsible for the provision of infrastructure, or they might seek to exert a strong degree of oversight and control. Perceptions of national security may vary by country. For example, in certain countries, particularly non-democratic ones, the telecommunications sector is increasingly viewed as sensitive from a security perspective and increasingly subject to government intervention.

**Figure 4.3 - Decision-making framework for infrastructure delivery**



### **4.3. Country circumstances**

123. A sector analysis applying the criteria described above should help to determine what the most economically efficient and politically acceptable mode of delivery for a particular infrastructure category is. However, this analysis ignores the fact that achieving economic efficiency in the real world depends on having in place an appropriate set of functioning economic institutions, among other things. What is economically efficient in theory might be less so in practice if a country's circumstances are ill-adapted to a particular mode of delivery. For example, for privatisation of infrastructure to be successful, there must be sufficient capacity in the private sector to deliver the infrastructure and create a credible threat of entry, as well as strong and independent regulatory institutions to ensure private firms do not gain excessive market power to the detriment of consumers and taxpayers. If these conditions are not in place, privatisation carries the risk of degenerating into a private monopoly that lowers welfare.

124. Thus, choices relating to sector approaches and delivery modes for infrastructure should be filtered by a consideration of a country's political economy, its institutions, the capabilities of both government and private sector, and its openness to foreign investment. If the gap between a country's circumstances and the requirement of a particular mode of delivery are too far apart, then pursuing that modality is sure to lead to failure. Governments then have the choice of pursuing the "second best option", which might not be the most economically efficient solution in theory but carries a higher likelihood of delivering value for money and improving welfare. Alternatively, a government may decide to adopt the most efficient solution as dictated by economic theory, but only after implementing the appropriate reforms, which might lead to long delays in infrastructure provision. Finally, if the gap between economic efficiency and country circumstances is too great, then the probability of successfully delivering welfare-enhancing infrastructure will be very low, in which case, the optimal choice might be to not proceed.

#### **4.3.1. Political economy**

125. A country's political economy might predispose it to particular modes of delivery. In economies where a significant proportion of production remains in the hands of the state, as in China or Vietnam, the financial and technological resources for developing infrastructure might be concentrated within SOEs.

126. On the other hand, in market economies productive resources and capabilities will be controlled, for the most part, by private firms with the state having developed sophisticated regulatory tools for influencing and monitoring private sector behaviour. Choices relating to the development of infrastructure should therefore take into account the distribution of productive resources within an economy.

#### **4.3.2. Institutions**

127. Successful infrastructure development also depends on having in place a set of economic institutions that are adapted to the choice of delivery mode. Delivery modes that involve some form of private sector participation, such as privatisation or PPPs, require, as a fundamental precondition, the rule of law along with a set of legal institutions that ensure access to justice, impartiality, and enforcement of legal rulings. In the absence of these conditions private firms are unlikely to even consider investing.

128. In addition to a sound legal environment, different delivery modes will require a specific set of institutions. A privatisation programme that aims to capture the benefits from competition requires an effective competition policy along with a regulator with sufficient independence and strength in order to enforce the policy and resist attempts by private firms, particularly incumbents, to gain unfair advantage over their rivals. A successful PPP programme depends on having an effective dispute resolution mechanism to handle the renegotiations that will inevitably arise. A traditional contracting approach requires a government procurement system that is transparent, effective, and sufficiently insulated from

corporate lobbying or corrupt influence. Finally, institutions such as state audit organisations and parliamentary oversight committees are essential to ensuring infrastructure investments are accountable to taxpayers and deliver value-for-money.

129. Therefore when deciding on a mode of delivery, policymakers should make sure that the appropriate institutions already exist and operate effectively. A weak or dysfunctional institution may be no better than none at all.

#### **4.3.3. *Government competences and capacity***

130. Different modes of delivery for infrastructure imply very different roles of the state. When governments deliver infrastructure through direct provision or traditional procurement, they are involved in the details of the asset delivery and contract management. On the other hand, when infrastructure is privatised the state will be playing the role of regulator and will delegate decisions relating to investment and production to the private sector. Both approaches entail a very different set of competences for governments.

131. As far as possible, government competences and capacity should be aligned with the choice of delivery mode. In a traditional procurement approach, strong managerial competences are required to develop detailed technical specifications, run an open bidding process, evaluate and select contractors, and monitor contractor performance. When infrastructure is developed by private firms in a competitive market, the government will need highly skilled technocrats to design and implement sophisticated regulatory instruments that influence the investment decisions of private firms. If implementing a PPP programme, the government will need experienced legal specialists that can design complex contractual structures that allocate risks among various project stakeholders. However, many countries don't have the skilled personnel required to staff and operate a PPP unit. This is even truer at the sub-national government level. Municipalities and regions often lack the adequate capacities and skills to conduct PPPs -- this was mentioned as a key obstacle in the multi-level governance questionnaire conducted in 2012 in 23 OECD Member countries (Investing Together OECD, 2013). When capacities require strengthening, support may be provided by higher levels of government or from external organisations such as universities, consultancies, or regional or international organisations (OECD, 2014c).

132. This is particularly relevant for sophisticated projects, such as "mega-projects" or projects with network characteristics and/or technical requirements that may extend beyond standard project appraisal skills and require specific types of expertise (e.g. engineering).

#### **4.3.4. *Private sector capabilities***

133. One of the rationales for involving private firms in delivering infrastructure is to gain access to capabilities - such as management skills or technology - that exist predominantly within the private sector. It follows that if those capabilities are not available within private firms, then private sector delivery may not generate efficiency gains and might even have a negative impact on value-for-money.

134. Moreover, when considering modes of delivery that depend on competition among private firms - whether "in the market" or "for the market" - it is particularly important to have sufficient depth in the private sector to create a competitive environment and provide a credible threat of entry. In the absence of a sufficiently diverse set of companies under separate ownership with the capabilities to deliver infrastructure, private sector provision in the form of PPPs or privatisation runs the risk of entrenching a dominant firm in a monopoly position with negative implications for prices and quality of service.

135. When private sector participation in infrastructure is aimed at contributing to private sector development, governments might need to provide support and incentives to new entrants in order to level

the playing field with incumbents. This is particularly important in the context of privatisation of SOEs in order to limit their ability to use their dominant position to suppress new entrants.

#### **4.3.5. *Openness to foreign investment***

136. When seeking to access the best available technology and management capabilities for infrastructure, and to maximise the benefits from competition, governments may sometimes need to look beyond their domestic markets. International companies can often contribute their experience and technological leadership gained from having managed many similar projects in other countries. This is particularly important when achieving efficiency gains and quality improvements depend on applying state-of-the-art technology. For example, large international water companies will have optimised techniques for improving billing and recoveries thereby reducing the need for government subsidies. A strategy involving foreign providers may also serve to diminish dependence on local infrastructure companies that have gained excessive influence and leverage over local politicians.

137. An obvious precondition for the participation of foreign companies in infrastructure is openness to foreign investment. Governments seeking to capture the full benefits of private sector participation should therefore seek to reduce, as far as possible, limitations and obstacles to foreign investment in infrastructure projects. However, restrictions on foreign investment in infrastructure sectors continue to exist in numerous countries. According to OECD FDI Regulatory Restrictiveness Index, “the transport sector, particularly air and maritime transport, including airport and port operations, tend to face greater restrictions” (OECD 2014b).

#### **4.4. *Choosing a project modality***

138. At the sectoral level, governments can contemplate the full range of delivery options for meeting infrastructure needs - from direct provision to privatisation. Once a sector strategy has been decided, the focus of planning and decision-making shifts down to the project level. As discussed above, governments will exert a greater degree of influence over sectors that are characterised by forms of market failure (e.g. natural monopolies, negative externalities) and a high degree of political sensitivity. Under such conditions, governments are likely to play the lead role in determining investment needs, selecting projects and choosing the appropriate mode of delivery for each project. If the government owns the investment and the decision relating to selecting which projects to pursue, it excludes the possibility of privatisation and possibly even corporatisation as delivery modes. The determination as to the most appropriate mode of delivery therefore shifts to the level of the individual project, and should consider all the available options, including traditional forms of procurement and various forms of PPPs (Figure 4.3).

139. Achieving value for money will depend on selecting the mode of delivery that achieves the best value for money by delivering the desired outcomes at the lowest possible cost. The desired project outcomes must reflect the objectives and preferences established by policymakers. It therefore requires a clear understanding and prioritisation of sector objectives (see above).

140. A particular delivery mode represents value-for-money if it can generate efficiencies over the project lifecycle without incurring excessive transaction costs. This depends on a number of project specific factors that are described below:

##### **4.4.1. *Size and profile of investment***

141. The choice of modality and contract must be adapted to the size and profile of the investment. Projects with high initial capital outlays typically require longer contracts in order to enable the developer to recover costs and make an attractive return. When privately financed, such projects typically involve a large proportion of debt finance and will therefore require a project finance structure.

142. Greenfield investments typically require high initial capital outlays during the construction phase followed by smaller investments in maintenance and repairs spread over the life of the project. Brownfield investments are likely to require smaller initial outlays but could require higher levels of spending in maintenance and refurbishment to compensate for the age of assets. Operating and maintenance services are more labour intensive than capital intensive, and are therefore more amenable to shorter-term contracts.

143. When projects entail elevated initial investments followed by significant operating and maintenance needs, there are clear advantages to bundling the construction, operation and maintenance of the assets in a single contract. Because developers seek to maximise their returns they face a strong incentive to complete the project on time (since the earlier the assets begin operations, the earlier revenues flow). Moreover, project developers will seek to optimise costs over the lifecycle of the project, which means they are less likely to compromise on quality during construction since they will have to bear the costs of future repairs and inefficient operation. For infrastructure projects with such a profile, PPPs offer, in theory, the optimal set of incentives for delivering efficiencies over the entire lifecycle of the project.

144. On the other hand, PPPs may not be suitable for smaller projects because the benefits from bundling may not be sufficient to compensate for what are typically elevated transactions costs due to the complexity of the contracting and negotiating process.

#### **4.4.2. Revenue sources**

145. A key consideration for the choice of delivery mode is how a project will ultimately be funded. In an ideal world, both capital and operating costs would be fully covered by user fees that are affordable for the entire population of potential users. Users' fees have the double advantage of ensuring that project costs are paid for by the beneficiaries of the service, and providing a mechanism for regulating demand. When users' fees are practicable and when they cover a substantial proportion of the total project cost, then concessions might be a preferred option.

146. Unfortunately, user fees, on their own, are seldom sufficient to cover project costs. For investments in sectors that have a non-excludable nature, user fees will not be practicable and the project will need to be funded via government spending, either through traditional procurement or some form of availability payment in the case of a PPP-type contract. Even where user fees are technically feasible, equity considerations might cap them at a level below what would be sufficient to cover costs and provide an adequate rate of return. For example, the majority of public transport systems, while charging passenger fees, require government subsidies to cover capital costs as well as a proportion of the operating costs. Under such circumstances, user fees would need to be supplemented through other sources of revenue. These typically include availability payments or shadow tolls funded by general government taxation.

147. A third source of revenue is what is known as land value capture. Infrastructure projects that promote urban development and renewal (such as the extension of a metro line), are often accompanied by increases in land and property prices in the areas that benefit from the infrastructure. By implementing various tax-based instruments to capture a portion of the increase in land values, governments can recover some of the costs of providing the infrastructure (Maier and Jordan-Tank, 2014).

#### **4.4.3. Extent to which quality is contractible**

148. When contracting out of infrastructure development, governments have a choice of defining deliverables in terms of inputs, outputs or outcomes. For example, a government buyer contracting for the construction of a school may specify, in detail, the design of the building down to the type of construction materials to be used (input-based). Alternatively, a government may wish to specify the desired performance of an urban transport system in terms of passenger capacity, and provide the contractor with

discretion on how best to achieve it (output based). Finally, a government may contract with a view to obtaining certain outcomes, such as increasing the number of students that graduate from high school, while, again, allowing the contractor to decide on the optimal combination of inputs (outcome based).

149. When quality is difficult to specify and monitor, then contracts are likely to be costly and time consuming to develop, and will be highly vulnerable to renegotiation. The decision on whether to base a contract on inputs, outputs or outcomes therefore depends (i) whether quality can be adequately specified, and (ii) whether quality can be monitored. The extent to whether quality is *contractible* is thus an important factor in determining the most appropriate mode of delivery for infrastructure (Hart, 2003).

150. When inputs are easy to specify and verify, but when outputs and outcomes are difficult to specify and/or monitor, then traditional procurement would be the most suitable approach. Alternatively, when outputs or outcomes can be specified and monitored, then PPPs might provide the most efficient means of delivering infrastructure.

151. A related factor has to do with the extent that innovation is important for achieving efficiency and value-for-money in project outcomes. When improvements in outcomes depend on innovative solutions provided by the private sector, then the public sector contractor should not be specifying the design, but rather should specify the quality of the outputs or outcomes (Burger and Hawkesworth, 2011).

#### **4.4.4. Level of uncertainty**

152. Infrastructure developers face the very significant challenge of making large investments in fixed assets with a lifetime intended to span two to three decades with highly limited knowledge of future conditions. Many of the most catastrophic infrastructure investments are the result of poor assumptions of future needs, often made worse by excessive optimism (Flyvberg, 2014).

153. Even when evaluations of future needs are subject to rigorous analysis (e.g. through applying scenario planning) and independent review, long-term foresight of societal needs and technologies is necessarily imperfect. Technology is an area where changes happen rapidly and often unpredictably. When considering a time span of 20 to 30 years, unpredictable change is the norm rather than the exception.

154. On the other hand, long-term infrastructure contracts (such as PPPs) require a high degree of certainty and are implicitly grounded in an epistemological view that the future is relatively predictable, and that changes can be foreseen, and, therefore, planned for. However, evidence from past PPPs suggests that long-term contracts that fully incorporate knowledge of all future conditions and are therefore robust to changing circumstances are the exception rather than the rule. Research examining PPP concessions in Latin America granted between 1985 and 2000 found that more than half of the contracts underwent significant renegotiations (Guasch, 2004).

155. Thus, for sectors and projects where change is likely to be rapid and dramatic, modes of delivery and associated contracts must incorporate a degree of flexibility. At the contractual level, contracts should contain trigger points for renegotiations or tariff adjustments (though even this requires a certain level of foresight in order to imagine what changes are plausible) (Guasch, 2004). In sectors where change is highly unpredictable (e.g. where technology is in flux) and therefore impossible to foresee with any level of confidence, preferred modes of delivery should be supple and adaptable, thereby avoiding lock-in to specific technologies or business models. This might include more relational forms of contracting or shorter-term contracts.



#### **4.4.5. Allocation of risks**

156. Large infrastructure projects are highly complex undertakings involving numerous interdependencies and multiple stakeholders. As a consequence, they are vulnerable to a plethora of potential causes of failure. Moreover, the risk profile of infrastructure evolves over time as the project progresses from design and construction to operation.

157. Achieving project success in a value-for-money sense depends on achieving an efficient allocation of risks. As a basic principle, risks should be allocated to those parties best able to mitigate or manage them. In addition, risk-bearing parties should not only have the capacity, but the incentives to mitigate them. When risks are poorly allocated, both the probability of occurrence and the expected loss given occurrence, increase. Thus, failures are more likely to occur and their impact become greater when risks are borne by the wrong parties.

158. Efficient risk allocation can be achieved through an appropriate choice of delivery mode, along with careful contract design that explicitly identifies and allocates responsibility for all risks. One of the benefits of PPPs is that they offer the potential to achieve an efficient allocation of risks between public and private parties. Moreover, the structure of PPPs, which involves bundling the design, construction and operation, provides strong incentives to the private partner to mitigate risks during each phase of the project. In addition, the financial structure of most PPPs - which involves a significant proportion of debt finance - means that lenders have a strong incentive to perform due diligence and monitor the actions of the project company.

##### *Design phase*

159. Errors and omissions during the design phase, such as wrong choices of technology, can lead to failure of the infrastructure system to meet performance and financial targets. It may also result in substantial rework that causes delays in start-up and cost overruns.

##### *Construction phase*

160. The construction phase is particularly sensitive given the inherent challenges of co-ordinating large complex projects involving numerous suppliers and a multitude of technical and logistical interdependencies. Moreover, failures during the construction phase can not only result in cost overruns, but delays can have important knock-on effects on the financial soundness of a project through impacting the timing of future revenue flows.

#### **Operating risk**

161. Risks during the operating phase relate, on the one hand, to the ability of the infrastructure to meet performance outputs and financial targets. This depends on the adequacy of the initial design and equipment, as well as the ability of the operating company to operate the facility to its full potential. For some types of infrastructure, such as electricity, the availability of inputs at an acceptable cost is crucial to a project's financial viability.

#### **Political and regulatory risk**

162. Infrastructure projects are also subject to a number of exogenous risks that relate to the wider political, legal and regulatory environment. Over the lifetime of an infrastructure project, it is more likely than not, that changes will be made to the legal and regulatory environment affecting the project. In many cases, such changes are part of the normal challenges of doing business and must be managed by the

project owner. However, changes to contracts and regulations might also be the result of unilateral or discriminatory actions of governments.

### **Demand risk**

163. Demand risk deserves particular attention because it represents a significant source of uncertainty and contention for many infrastructure projects. Errors in forecasting demand in the planning phase of projects may result in "white elephants". Such errors can sometimes take on tragic proportions when they are the result of the hubris of policymakers and investors.

164. Demand risk can be lowered through rigorous analysis and independent reviews during the project planning phase. However, careful consideration should also be given to the allocation of demand risk to ensure that the party best able to influence demand bears a substantial proportion, if not all, of the risk. For infrastructure projects, this is regularly the government since the government may be acting as the buyer (as in the case of a power purchase agreement) or the payer (as in the case of non-excludable public goods such as education).

165. Even for infrastructure funded primarily through user fees, considerations of equity and affordability might lead the government to limit user fees and subsidise a proportion of the cost thereby reducing the risk for the private provider. The government may have significant influence over the level of demand and project revenues through the provision of complementary or competitive infrastructure, or through policy. This would be the case of a toll road where demand from drivers could depend on the availability of alternative free road networks as well as other transport infrastructure such as rail.

166. In other cases, the private sector might have significant influence over demand, to the extent that it could be one of the principal rationales for private participation. For example, in the case of a port or airport a private company's experience in operating similar infrastructure elsewhere might enable it to increase revenues through market segmentation, improvements in pricing, and the introduction of additional services.

167. Demand is typically more predictable for existing infrastructure which has been operating for a while and where usage patterns can be observed. Thus, infrastructure projects involving upgrading existing assets are often suitable for concessions since the operator can better forecast future demand.

168. Ultimately, the allocation of demand risk is highly contingent on the nature and circumstances of the project and depends on a range of factors including affordability, excludability, and ability to influence.

## CONCLUSION

169. The objective of good infrastructure governance is to ensure an infrastructure program that makes the right projects happen, in a cost-efficient and affordable manner that is trusted by users and citizens to take their views into account. It sets out nine preconditions for the governance of infrastructure and a decision tree that sets out key questions enabling countries to take a fresh look at their infrastructure delivery choices and identify where a change might add value. The framework does not provide a cook-book formula for determining how to deliver an infrastructure asset, nor does it suggest a one-size-fits all institutional structure for government. These decisions will take place in an iterative fashion where policy objectives, political economy and facts on the ground will inform each other. However, it is argued that it is necessary for countries to address the challenges of infrastructure governance in order to ensure legitimate, cost-efficient and affordable infrastructure. The framework will provide the necessary foundation for such an endeavour.

## APPENDIX 1. - DELIVERY MODES AND GOVERNANCE MECHANISMS

<b>Delivery modes</b>	<b>Direct provision</b>	<b>Traditional public procurement</b>	<b>SOEs</b>	<b>PPPs</b>	<b>Regulated privatisation</b>	<b>Privatisation with liberalisation</b>
<b>Role of government</b>	Planner, manager, producer	Planner and manager	Owner and planner	Planner and regulator	Regulator	Referee
<b>Responsibility for project selection</b>	Government	Government	SOE and government	Government	Private firms with government influence	Private firms
<b>Governance mechanisms</b>	Command and control	Public procurement law	Corporate governance	Contractual agreements	Sector regulation	Competition policy
<b>Relevant guidelines</b>	OECD Draft Principles on Budgetary Governance	OECD Principles for Integrity in Public Procurement	OECD Guidelines on Corporate Governance of State-owned Enterprises	OECD Principles for the Public Governance of Public-Private Partnerships	OECD Recommendation of the Council concerning Structural Separation in Regulated Industries	OECD Recommendation of the Council concerning Structural Separation in Regulated Industries

**APPENDIX 2. - PROJECT CRITERIA FOR DETERMINING  
THE OPTIMAL DELIVERY MODE**

	<b>Traditional procurement</b>	<b>PPPs</b>	<b>Concessions</b>
<i>Project size and profile</i>			
Large initial capital outlay and long payback period?	--	Yes	Yes
Is the project large enough to justify the additional legal, technical and financial costs of a PPP?	No	Yes	Yes
Can quality enhancements in the design and construction phase generate savings during the operating phase of the project?	--	Yes	Yes
Do these savings justify the additional transaction costs involved in bundling construction, operation and maintenance in a single contract?	No	Yes, for sufficiently large projects	Yes, for sufficiently for large projects
<i>Revenues and usage</i>			
Can user fees be charged, are they affordable for the majority of users, and are they politically acceptable?	No, funded through government expenditure	No -- funding must be provided through availability payments.	Yes, though some cross-subsidisation may be necessary to reduce burden on low-income users
Are user fees sufficient to cover the majority of capital and operating costs?	No	No	Yes, though sometimes users fees must be supplemented with subsidies
Can usage be monitored?	No	No	Yes -- either users are charged directly or shadow tolls are applied
<i>Quality</i>			
Can the quantity and quality of project inputs be specified and measured efficiently?	Yes	--	--
Can the quantity and quality of project outputs or outcomes be specified, monitored and enforced efficiently?	No	Yes	Yes
Will design innovation be required to achieve improvements in efficiency and value-for-money?	No	Yes	Yes

<i>Uncertainty</i>			
What is the level of uncertainty relating to future technological or societal conditions?	Moderate to high	Low	Low
<i>Risks</i>			
How are risks allocated?	Construction risk is shared, though public sector bears most other risks.	Private sector bears construction and operating risk. Public sector bears demand and political risk.	Private sector bears construction, operating and some demand risk. Public sector may bear some of the demand risk (e.g. minimum revenue guarantee) and political risk.
Is demand relatively predictable over the lifetime of the project?	No	No	Yes, particularly when project involves existing assets that have an operating history
Who is best placed to influence demand for the infrastructure-based service?	Public sector	Public sector	Private sector
Is the private sector willing to and capable of bearing some or all of the demand risk?	No	No	Yes
Are there particular integrity risks in terms of corruption and undue influence that merit attention?	Yes -- at both technical level and decision-maker level	PPP/concessions. are more carefully scrutinised in the initial stages. However, negotiations during the implementation period are particularly vulnerable to corruption.	See PPP

Note: This table should not be interpreted to be either for or against increased public provision or private sector participation in infrastructure delivery. It is offered as a guide to key questions and indicates possible relevant experiences from OECD Member countries to reflect on. It attempts to compress the experience of countries and practitioners into an overall check-list format of key issues. There will therefore be cases, countries and sectors where the experiences are not sufficiently reflected in the above.

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