



DECISION MAKERS' GUIDE TO ROAD TOLLING IN CAREC COUNTRIES

JUNE 2018



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This guide is part of a series of knowledge products being developed to support CAREC member countries in addressing priorities identified in the CAREC Transport and Trade Facilitation Strategy 2020.

Abbreviations

ADB	Asian Development Bank
ANPR	automatic number plate recognition
BOT	build–operate–transfer
CAREC	Central Asia Regional Economic Cooperation (Program)
EBRD	European Bank for Reconstruction and Development
GPS	global positioning system
km	kilometer
m	meter
OBU	on-board unit
PPP	public–private partnership
PRC	People’s Republic of China
SPV	special purpose vehicle
TTFS 2020	Transport and Trade Facilitation Strategy 2020

Introduction to This Guide

1.1 Background

1. Transport is the largest sector of cooperation under the Central Asia Regional Economic Cooperation (CAREC) program. Reflecting the needs of CAREC member countries for better connectivity, cumulative transport investments under CAREC reached \$23.4 billion by the end of 2017, accounting for 77% of all CAREC investments. These investments supported the formation of six multimodal transport corridors, originally set in 2008, and refined in 2013 under the Transport and Trade Facilitation Strategy 2020 (TTFS 2020). Focusing on the roads subsector, approximately 8,600 kilometers (km) of expressways or national highways were built or improved.

2. With the creation of these road assets, it becomes more pertinent for CAREC countries to improve operational and institutional effectiveness of the road transport network. The TTFS 2020 attaches importance to providing adequate maintenance of CAREC road corridors to ensure they deliver the intended level of road service quality. Through the adoption of TTFS 2020, CAREC countries agreed to take measures to help increase government budgets, and set up road funds and road tolling to ensure adequate maintenance funding. TTFS 2020 also noted that support will be provided for asset management systems to help in prioritizing and implementing road maintenance and conducting comprehensive road condition surveys and traffic counts to provide reliable baseline data to develop a results-based road maintenance strategy for the corridors. TTFS 2020 anticipated that performance-based contracts would be expanded to at least three CAREC countries.

3. Since the adoption of TTFS 2020 in 2014, the Transport Sector Coordinating Committee of the CAREC program has worked to consolidate knowledge and experiences from CAREC member countries themselves, as well as from across the world, which can be applied to help meet the aforementioned goals.

4. This publication, together with its two sister publications (*Compendium of Best Practices in Road Asset Management* and *Guide to Performance-Based Road Maintenance Contracts*), is meant to be a practical resource for policy makers to improve the underlying conditions required for good road maintenance.

5. This is meant to be a living document, to be updated from time to time, as CAREC countries further agglomerate knowledge and experience in tolling roads.

1.2 What are the objectives of this guide?

6. The objectives of this guide are
 - to provide fundamental concepts concerning the tolling of roads;
 - to address the main options and concerns typically faced in the introduction of tolls; and
 - to provide useful tips for the preparation, implementation, design, and operations of toll road projects.
7. This guide focuses on the most common challenges decision makers may face in this field, and extracts lessons from experiences across the world, especially those more relevant to Central Asia Regional Economic Cooperation (CAREC) countries' particular circumstances.

1.3 To whom is this guide addressed?

8. This guide seeks to be a clear and user-friendly tool kit for senior officials, decision makers, and practitioners in CAREC countries, whether they are already involved in toll road projects, or may be in the future.
9. It may also be useful to other stakeholders (legislators, other public authorities, business and consumers organizations, road transportation guilds, trade unions, etc.) as it provides a wide-ranging perspective on toll roads.

1.4 To what extent are toll roads used across the world?

10. The tolling of roads has been a common feature since ancient times. Many empires and states throughout history collected levies from travelers using roads, crossing bridges, or entering city walls.
11. In fact, the free use of roads is a rather recent concept that emerged when states developed a tax base strong enough to fund road construction and maintenance. Quite often, petrol taxes provided a substantial part of the resources needed to fund roads.
12. Expanding road networks and accelerated wear and tear caused by growing traffic have exponentially increased the amount of resources required in the roads sector. At the same time, many social demands are competing with roads for public money. As a result, traditional road financing schemes are stretched in some countries. Here lies the need to look for additional sources of revenue.
13. More recently, social awareness about the externalities created by road transport (pollution caused by combustion engines, road congestion, noise, or accidents) has added a new dimension to road and transport policies. Countries are committed to international agreements regarding the control and reduction of these externalities. This is leading to the introduction of pricing mechanisms aimed to offset the social and environmental costs of road transport and to stimulate greener mobility patterns.

14. Be it the result of budget constraints, of environmental policy, or both, we can find some type or other of tolls or charges in most countries in the world with an extensive network of paved roads and motorways,¹ regardless of geographical region, development stage, or ideology. The introduction of such schemes proves to be politically sensitive everywhere as it faces concerns and opposition from a variety of stakeholders.

1.5 Why are toll roads relevant to CAREC countries?

15. The discussion on tolls is relevant to CAREC² countries as most of them share specific features. For a range of examples of how toll roads are used in CAREC member countries, see Box 1 for the People's Republic of China (PRC), Box 2 for Kazakhstan, and Box 3 for Tajikistan.

16. Toll roads could be an opportunity to tackle some of the region's problems:

- Their geography usually involves vast distances, rough orography, and severe weather. These factors mean investment and maintenance requirements are high.
- The condition of the road networks in many areas degraded severely after the split of the former Soviet Union or because of conflict and civil unrest.
- Although some of the most resource-rich countries managed to fund substantial improvements in their road network, the average road condition in the region is still poor.
- Low taxation on petrol is common in CAREC countries, which limits a potential source of revenue that could be used on road improvements.

17. However, this region poses some specific challenges to the introduction of toll roads. Thus, in most countries that were part of the former Soviet Union, challenging the notion of free or heavily subsidized transport or defending the option of private participation in the provision of infrastructure may be a harder task than elsewhere.

¹ The many definitions in English for automobile roads sometimes cause confusion. The Oxford English Dictionary's definition for **road** is: "A wide way leading from one place to another, especially one with a specially prepared surface which vehicles can use." Its definition for **motorway** is: "A dual-carriageway road designed for fast traffic, with relatively few places for joining or leaving." However, in American English, **highway** has become the standard word to define main roads irrespective of the number of lanes they have. The American English equivalent of motorway is usually **expressway**, **freeway** (when non-tolled) or **turnpike** (when tolled). Other English-speaking countries, as well as countries where English is not the main language, use other names such as **superhighways**. In this guide, we opted to adopt the British English terminology: roads as a generic name and motorways for fast dual-carriageway roads.

² At the time this report was being finalized (October 2017), toll roads are common in the PRC. Kazakhstan, Pakistan, and Tajikistan have introduced tolling in some motorways. A limited example exists in Mongolia (the Tavan Tolgoi–Gashuun Sukhait toll road). Plans are under way for the introduction of tolling in some roads in Azerbaijan, Georgia, the Kyrgyz Republic, Turkmenistan, and Uzbekistan at different stages of development.

Box 1: How the People's Republic of China Created the World's Biggest Network of Toll Motorways

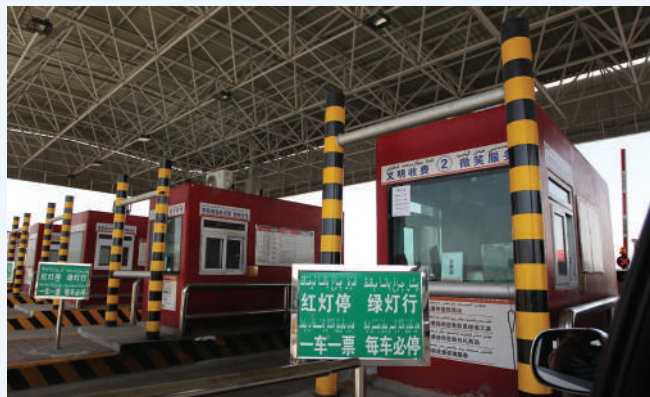
With more than 120,000 kilometers (km) of motorways, the People's Republic of China (PRC) now boasts of the biggest such network in the world and has grown at an unprecedented speed from the mere 522 km the country had in 1990, when the National Trunk Highway System was launched. It is estimated that about 70% of all toll roads in the world are in the PRC.

The PRC's decentralized institutional and funding mechanisms have been instrumental to this success. Although the Ministry of Transport is responsible for planning and setting the framework for the main network (known as the "7918 network" for 7 roads radiating from Beijing, 9 axes north-south, and 18 axes east-west), provincial governments financed most the capital cost from domestic and international borrowing and budget funds. Special purpose companies were created to construct and operate the roads, usually on a case-by-case basis, with variable participation of the provincial governments and other private sponsors. Thus, provincial governments have substantial stakes in toll road operators.

The impressive expansion of the PRC's motorway network would not have been possible without the combination of government funds, private investment, and international and domestic finance. This growth process also facilitated the emergence of some engineering and construction conglomerates that have become very active in the international scene.

However, the quick process also posed great challenges to provincial governments, not only in a financial sense, but in an institutional and governance level as well. As a study by the Asian Development Bank recommended in 2008 (see sources below), improved governance was needed in particular to

- clearly separate the roles of owner and service provider functions;
- use competition to promote efficiency, quality, and economy of outsourced tasks as well as project financing, delivery and operations;
- make better assessment of value-for-money and best technical, management and financial options;
- better define roles, obligations, and performance targets in concession contracts; and
- create a more transparent project planning and procurement process.



Toll booths at the Korla-Kuqa expressway in Xinjiang, People's Republic of China. It is estimated that about 70% of all toll roads in the world are in the PRC. (Photo by Deng Jia/ADB)

Sources:

ADB. 2008. *PRC Toll Roads Corporatization Strategy: Towards Better Governance*. Manila.

B. Reja et al. 2013. China Road Tolls Policy: Past Achievements and Future Directions. *World Bank News*. June 14. <http://www.worldbank.org/en/news/opinion/2013/06/14/china-road-tolls-policy-past-achievementsand-future-directions>.

Box 2: The Introduction of Toll Roads in Kazakhstan

Kazakhstan first introduced tolls in the 224-kilometer (km) long Astana–Schuchinsk motorway in the spring of 2013. The road was put into operation in 2009. Tolls were introduced later after investing \$4.7 million in toll collection equipment and were considered as a pilot experience. The operator is the National Roads Company, KazAvtoZhol. Toll payments can be made in cash, with a bank card, or electronically. Discounts for local citizens were introduced.

Although there were initial concerns about users' reactions to paying for the use of infrastructure, more than 2.5 million vehicles used the road in 2015; the average volume of cars was 7,000 with weekend peak intensity of 10,000–12,000 vehicles. Fees paid in 2015 exceeded expectations and amounted to about \$2.98 million. Compared to 2014, the intensity of the flow of vehicles increased by an average of 4.9%, thereby increasing revenue by 7.2%.

Revenue is earmarked for road maintenance and to offset toll operation costs, but not to recover road construction costs.

KazAvtoZhol introduced new noncash forms of payment, such as subscription fees, and prepayment via self-service terminals and transponders to reduce the load on the bill validators and avoid the congestion at toll stations. However, only about 700 vehicles use such passes per day.

After this pilot experience of tolls under public sector management, the Government of Kazakhstan prepared the first toll road project under a proper public–private partnership (PPP) scheme. It will be the 66 km Almaty Ring Road PPP Project (BAKAD) that aims to reduce travel times by up to an hour, handling transit traffic and serving commuters from three districts neighboring greater Almaty.

The scheme envisaged is a 20-year build–operate–transfer concession. The estimated budget is \$680 million. The project counts on the support of the European Bank for Reconstruction and Development and the International Finance Corporation (the private sector arm of the World Bank), which acts as lead transaction advisor. The financial close was expected to be achieved in 2016.

Sources: International Finance Corporation. <http://www.IFC.org>; <http://kazautozhol.kz>; Kazakhstan National Roads Company, KazAvtoZhol. Tengrinews. <https://en.tengrinews.kz>; and Astana Times. <http://astanatimes.com>.

Box 3: Tajikistan's Early Experience with Toll Roads

Tajikistan was in great need of investment in its road network after some years of neglect following the breakup of the former Soviet Union. Being one of the poorest former Soviet republics, and having a rugged geography and extreme weather conditions only added to the challenges faced by the government.

The 345-kilometer Dushanbe–Khujand–Chanak road that links the capital to its second city and to neighboring Uzbekistan is one of the country's main economic corridors. A major \$295.9 million rehabilitation program was carried in 2007–2010 financed through a \$281.1 million concessional loan from Export Import Bank of China and the remaining \$14.8 million from the government. The operations and maintenance of the road was awarded to a private operator (International Road Solutions-IRS) under a 30-year concession up to 2039 and, thus, Tajikistan became the first former Soviet Union republic in Central Asia with a privately operated toll road.

This was not an easy way. The country lacked an appropriate legal and institutional framework for a public–private partnership and had limited negotiations, commercial and communications skills to handle a project of this type.

Since the road traverses two passes at over 3,000 meters in altitude, it is the only way to drive along the corridor. Not surprisingly, public concerns about transparency and the operator's monopolist position soon appeared. There were also complaints about the effects of tolls (an open toll system) on local residents and businesses on both sides of the toll collection points. To address this issue, the government imposed on the operator the issuance of free electronic payment cards (ET-Cards) for the local residents.

Sources: ADB. 2011. *Developing Tajikistan's Transport Sector*. Manila; Central Asia Regional Economic Cooperation Program. <http://www.carecprogram.org>; Eurasianet. <http://www.eurasianet.org>; Innovative Road Solutions. <http://irs.tj/>.

Tolls in the Broader Perspective of Roads Funding

2.1 What are tolls?

18. Fees collected for the use of roads, bridges, tunnels, or motorways are commonly referred to as tolls. Tolls have a compulsory character and, thus, need to stem from regulations that set (i) their level, (ii) who is authorized to collect them, and (iii) how nonpayment and fraud can be enforced. Legal and regulatory aspects of tolls are addressed in Chapter 5.

19. Tolls are founded on the “user pays principle.” This implies that users of roads, need to pay for the full or part of costs needed to build and/or maintain them in a broader approach used in some countries, infrastructure costs include not just construction and operations, but also other costs borne by the society, such as congestion, pollution, noise, or road crashes (external costs).

2.2 What are the most common types of tolls?

20. According to the criteria to set them, tolls can be classified into four main categories:

- **Distance-based.** In this category, users pay in proportion of the distance traveled on a particular road. The distance traveled can be calculated fairly easily when the road has a limited number of controlled entry and exit gates to keep a record of where the vehicle has entered and where it has left. This system is referred to as **closed tolls**. However, this is sometimes difficult or expensive. For this case, tolling points are placed along the main section of the road at various intervals. This system is referred to as **open tolls**. Read more about costs, operations, and pros and cons of open and closed tolls in section 11.1.
- **Point-based.** This is when payment is made for a single use of a particular section. This system is common for bridges or tunnels. Tolls collected under an open tolling system fall within this category as well.
- **Time-based.** Time-based charges allow users to drive along some roads for a period of time irrespective of the level of use. These charges are sometimes referred to as “**vignettes**,” derived from a sticker or vignette affixed on the front windscreen. Vignettes may be applied to all vehicles or just to some of them, typically heavy vehicles. They may be applied to the whole network or to just a part of it, typically major motorways and other high capacity and/or high performance roads. Foreign vehicles entering the country usually must buy the vignette at the border for the period they plan to stay. Domestic vehicles will typically buy the vignette annually. Whether vignettes should be considered properly as tolls or as a type of tax is subject to discussion. This guide will not treat in depth vignettes and similar schemes.³

³ An overview of vignettes in European countries, including current rates, can be found at: <http://www.tolls.eu/> or <https://www.eurovignettes.eu>.

- Perimeter-based.** These are fees charged to any vehicle that wishes to circulate inside a defined perimeter, normally the central area of a city, and sometimes referred to as **congestion charges**. They can be time-based, i.e., an entry permit that allows the vehicle to circulate inside the area as many times as desired during a period of time (such as the London Congestion Charge) or cordon-based, i.e., that every time a vehicle enters the perimeter, a charge is levied (such as for Oslo, Norway; Singapore; or Stockholm, Sweden). This guide will not discuss in detail these types of charges.⁴



Toll plaza in Spain. Many motorways in Spain are subject to distance-based toll charges. (photo by Ignasi Ragas)



Toll gate in Viet Nam. The Ho Chi Minh City-Long Thanh-Dau Giay Expressway uses a closed toll collection system. (photo by Eric Sales/ADB)

⁴ For congestion charges in London, see: Greater London Authority. Congestion Charge. <https://tfl.gov.uk/modes/driving/congestion-charge>; in Singapore: Government of Singapore. Land Transportation Authority. Electronic Road Pricing. <https://www.lta.gov.sg/content/ltaweb/en/roads-and-motoring/managing-traffic-and-congestion/electronic-road-pricing-erp.html>.

2.3 What are direct and shadow tolls?

21. In some literature, tolls that users pay in whatever form are referred to as direct tolls. This is to differentiate them from shadow tolls.
22. Shadow tolls refer to a particular arrangement where a private company builds and/or operates a road under a public–private partnership (PPP) scheme, and is not remunerated from fees levied on users but from direct payments made by the government proportional to the traffic. These types of contracts are typically used (i) for road corridors with thin traffic flows where direct tolls would be insufficient to recover costs, or (ii) where direct tolling would not be acceptable for whatever reason. They are commonplace in some countries with a variety of forms. An example of the limits of the widespread use of shadow tolls is described in Box 4.

Box 4: Portugal’s Shadow Toll Tolls Coming into the Sunshine

Portugal adopted an aggressive strategy to build motorways and increased its network from 316 kilometers (km) in 1990 to 2,100 km by 2007, partly benefiting from the European Union’s cohesion funds. This development helped the creation of some important private players and pioneered in Europe the use of electronic tolling systems (Via Verde).

Apart from direct toll roads, a scheme of shadow toll motorways called “SCUT” (SCUT stands for “No Cost for Users” in Portuguese) was introduced for poorer or sparsely populated regions. The scheme soon proved to be unsustainable and budget constraints after the Euro crisis in 2008 led to the radical transformation of SCUT into electronic tolled motorways since 2011.

This became a major political, legal, and technical challenge. Users should be educated about the need to pay for what used to be free. Contracts with private operators needed to be substantially reworded and new equipment and information technology systems had to be put in place in record time. Hundreds of drivers of foreign vehicles not aware of the changes were fined.

Portugal’s experience shows the limits of free-of-tolls public–private partnership schemes that may become unsustainable burdens in times of economic hardship. On the positive side, it shows how a small country can succeed in being innovative (in e-tolling) and in implementing radical changes in a short time.

Source: Author.

2.4 Are there other systems to finance roads? What are their implications?

23. As mentioned above, expanding road networks and maintaining them under appropriate conditions of service and safety require vast and increasing resources. This situation puts pressure on governments that must address many other economic and social needs with limited resources.

24. Governments have a variety of options to fund road construction and maintenance. These options have different effects on social equity and provide different incentives on road usage and the use of fuel-efficient vehicles. It is useful to look at the most common options and their implications to frame tolling schemes in the wider context of road sector policies (See Table 1).

Table 1: Sources of Road Funding and Their Implications

Source of Fund for Roads	Who Pays and Implications
Income taxes	All taxpayers pay proportional to their income regardless of whether they drive or not, and their level of utilization.
Petrol taxes	All drivers pay in proportion of road usage (more kilometers driven means more fuel consumed) and fuel efficiency of their vehicles (drivers of fuel-guzzling vehicles will pay more). Petrol taxes have the capacity to raise huge amounts of revenue and provide incentives for more environmentally friendly use of roads. However, as indirect taxes, their impact is proportionally higher on the low-income population as well as on transportation companies and professionals. See Box 5 for some of the issues in the application of petrol taxes in the case of the United States.
Tolls	In principle, tolls are paid by users of a particular infrastructure in proportion to their level of utilization. However, since tolls are not generalized to all roads, users of toll roads will pay but users of “free” roads will not. This may create comparative imbalances among people living and/or working in different areas. Moreover, as fixed charges, their impact is proportionally higher on low-income populations. Pros and cons of tolls are further discussed in section 2.5.
Vignettes	Users of infrastructure pay, irrespective of their level of use. Due to how the scheme is built, vignettes may have the same drawbacks as tolls and other indirect taxation. However, they may provide incentives for the use of more efficient and less polluting vehicles (cheaper or no vignette required for these). Vignette-based systems may be interesting for countries that lie in the middle of transport corridors and whose roads are used by a great number of foreign trucks and cars that do not pay taxes and sometimes do not even fill their tanks in these countries.
Oil, mining, or pension funds	Some governments may be tempted to tap funds prepared for future needs to avoid the political consequences of setting charges or increasing taxes. This may lead to the illusion that no one pays for the roads now, but future generations must pay for the infrastructure their predecessors used.

Source: Compiled by author.

Box 5: Fuel Tax in the United States

The United States Interstate Highway System was the first continental scale motorway network to be designed and constructed in the world. It took 35 years to complete after the approval of the Federal Aid Highway Act of 1956. It now has a total length of 77,017 kilometers.

The funding principle underpinning the scheme was the introduction of a fuel tax administered by the Highway Trust Fund. This tax was set at \$0.03 per gallon in 1956. It was increased several times until 1993. Since then it has remained flat at \$0.18 per gallon because of politicians' inability to reach a compromise in Congress. If the consumer price index is considered, the tax should have been \$0.30 per gallon in 2016. This means the revenue now has lost about 40% of the purchasing capacity it had in 1993. Because of insufficient funding, poor road maintenance is becoming a major problem. To address this situation, some states increased their own taxation on fuels and have become more open to exploring options for introducing tolls and PPP schemes.

Source: Author.

2.5 What are the main pros and cons of tolls?

25. The advantages and disadvantages of tolls are summarized in Table 2.

Table 2: Pros and Cons of Tolls

Pros of Tolls	Cons of Tolls
<ul style="list-style-type: none"> • New source of revenue. Tolls create a new source of revenue for road construction and/or maintenance without raising taxes or excise. • Revenue not tied to the budget and national accounts. Tolls may create a stable source of revenue not tied to the budget that allows financing or maintaining road infrastructure outside the national accounts. • Internalize external costs. Tolls make drivers internalize the external costs associated with road use (the user pays principle) and, thus, sets a price incentive to make a more efficient and responsible use of roads. • Toll schemes can be set to permit cross-subsidization, e.g., (i) support roads with higher construction costs with surpluses from other roads with lower construction costs, (ii) tolls in motorways raise revenue to maintain “free” roads (collector roads or other), or (iii) tolls in better-off regions finance infrastructure in less developed ones. • Future toll revenue can be used as collateral in loans or can be securitized. 	<ul style="list-style-type: none"> • Diversion of traffic. Tolls can promote the diversion of traffic from toll roads to “free” ones (usually secondary or local ones) causing congestion in roads not prepared to cope with it. The issue of the “free alternative road” is addressed in section 4.4. • Congestion at toll booths. Stopping at toll booths may cause congestion if traffic is heavy. Efficient electronic tolling systems may reduce significantly, but not eliminate, this risk. • Collection costs. Toll collection involves costs and they may become not negligible in the total operating costs. • How tolls are collected may create unfair situations. Some examples of these situations and how to reduce them are illustrated in section 7.6. • Social impact. Since tolls are fixed tariffs, they may be a proportionally bigger burden on poor than rich people. • Political opposition. The introduction of tolls is most often unpopular, and opposition may turn schemes unworkable. Some guidance on how to deal with opposition to tolls is provided in section 4.7.

Source: Compiled by author.

3

Tolls in the Context of Private Sector Participation in Roads Funding and Operations

3.1 What is the relationship between tolls and privatization?

26. The introduction of tolls does not necessarily equate to privatization of roads. In many countries, tolls are completely in the public sector domain under different forms, whereas many other countries have experienced various degrees of the private sector’s involvement.

27. A gradation of the options involving private sector participation in toll roads is shown in Table 3.

Table 3: Options of Private Sector Participation in Toll Roads

No.	Who Owns the Road	How Investment Is Financed	Who Is Responsible for Construction ^a	Who Is Responsible for Maintenance ^a	Who Is Responsible for Toll Collection ^a	Description	Where Is It Found
1	Private sector	Private sector	Private sector	Private sector	Private sector	This is a fully private road.	Very rare. Only found in private premises.
2	Public sector	Private equity and debt ^b	Private sector	Private sector	Private sector	This is a build–operate–transfer (BOT) scheme with a fully private operator. The infrastructure will be handed over to the public sector after a period of time stipulated in a concession contract.	Very common.
3	Public sector	Equity with minority participation from public sector Private debt ^b	Predominantly private sector	Predominantly private sector	Predominantly private sector	In this case, the operating company under a BOT contract is a joint venture between public and private partners. The public sector may sell its stake during the concession period (full privatization) or not.	Rather common.
4	Public sector	Equity with a majority (or full) participation from the public sector Private debt ^c	Predominantly public sector	Predominantly public sector	Predominantly public sector	In this case, the operating company is acting under a license or franchise contract. Total or partial privatization may be envisaged in the medium or long term.	Common in countries with little experience and/or incipient public–private partnership markets.

continued on next page

Table 3 *continued*

No.	Who Owns the Road	How Investment Is Financed	Who Is Responsible for Construction ^a	Who Is Responsible for Maintenance ^a	Who Is Responsible for Toll Collection ^a	Description	Where Is It Found
5	Public sector	Government budget	Public sector	Private sector	Private sector	Government entrusts the full operation and maintenance of an existing road ⁽³⁾ to a private company for a period. This is commonly referred to as an operation and maintenance concession.	Rather common (e.g., in Latin America).
6	Public sector	Bonds financing a public sector corporation	Public sector	Public sector	Public sector	National or state governments create a public sector corporation allowed to issue government-backed debt. The corporation stakes cannot be sold to the private sector.	Common in the United States, rare elsewhere.
7	Public sector	Government budget	Public sector	Public sector	Private sector	This is the case when the authority in charge of roads outsources toll collection to private specialized companies. Usually it will not involve commercial risk. It may be a variation of models 4 and 6, where public or semipublic companies outsource toll collection.	Rather uncommon.
8	Public sector	Government budget	Public sector	Public sector	Public sector	This is the case of a 100% public funded and operated road where tolls are collected directly by staff from the roads authority or other civil servants.	Rather uncommon.

^a We refer to who bears the ultimate or contractual responsibility, regardless if the effective activities such as construction, maintenance, or toll collection are carried out by own staff or outsourced to specialist companies. Construction works are contracted out in almost 100% of cases. Also, both public and private toll road operators tend to outsource maintenance under a variety of arrangements. Finally, toll collection tends to be increasingly outsourced as well, in particular when it involves sophisticated information technology systems (electronic tolling).

^b Sometimes with partial financing, grants, or guarantees from the public sector.

^c Often these types of contracts involve the obligation to make major rehabilitation works to the existing road. In these circumstances, it will be a variation of build–operate–transfer sometimes referred to as a rehabilitate–operate–transfer scheme.

Source: Compiled by author.

28. It is to be stressed that tolls and PPP are instruments to attain certain policy objectives, and are not objectives themselves. A variety of schemes, some combining tolls and PPP while others not, can be found responding to different sets of priorities and different social, political, and economic backgrounds. The Russian Federation provides an example of how PPP was applied in a backdrop of a centrally planned economy (Box 6). In section 3.2, the suitability of tolls and PPP to attain certain policy objectives is further discussed.

Box 6: The Russian Federation's Experience in Toll Roads—M11 Motorway

The Russian Federation provides an example of an elaborate public–private partnership (PPP) promotion policy in the transport sector from a centrally planned economy background.

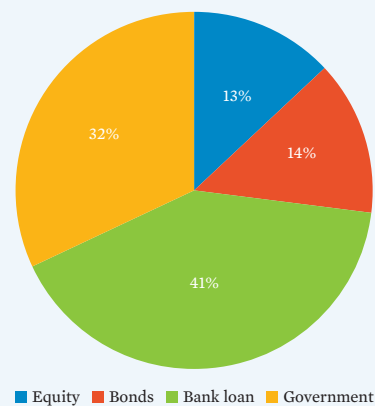
The setup of a PPP framework for the roads sector included:

- Adopting a federal law on concession agreements in 2005, followed by a government regulation in 2006 that approved concession agreements for motorways and other infrastructure such as bridges, overpasses, tunnels, parking, checkpoints, and toll booths for trucks.
- Setting up of a Russian Federal Highways Agency (Avtodor) by federal law on 2009 as the contracting authority to implement PPP schemes.

One of the Russian Federation's major road projects is the 648-kilometer (km) M11 motorway linking Moscow to Saint Petersburg. M11 motorway runs in parallel to the single carriage, two-lane M10 road, which is the free alternative.

The first 43 km section of M11, which runs north from Moscow (MKAD ring road) and serves Sheremetyevo International Airport, started operating in 2015 under a concession awarded to NWCC, a joint subsidiary of Mostotrest (a Russian Construction conglomerate) and VINCI (a French construction and concessions group) in 2008. The contract covers design, financing, and construction of the section and its operation and maintenance for a period of 30 years. This section was financed through a combination of shareholder investment of Russian ruble (RUB)9.2 billion (VINCI: 50%, Mostotrest: 50%), a ruble bond issue (RUB10 billion), a bank loan (RUB29 billion) and a state subsidy of RUB23 billion.

Box Figure: Financial Structure of Concession for First Section of M11 Highway



Source: Vinci. <https://www.vinci.com>.

Works for other sections of the motorway are under way under new PPP agreements.

Two issues that needed to be dealt with to attract private and foreign investment were uncertainties regarding regulatory environment, as little experience in roads' PPPs existed, and demand uncertainties in a country with long distances, lack of disposition to pay for roads, and population concentrated in a few urban centers. Thus, substantial government support for the development of M11 has been required. As an example, for the last 138.8 km section up to Saint Petersburg, the funding structure proposed has been 75% government and 25% private.

The type of concession is an availability-based concession with guaranteed payments to cover operations costs and loan repayment. In this way, the impact of eventual penalties for failures will affect only the sponsors through their equity, not the financiers.

Sources: Russian Highways. <http://www.russianhighways.ru>; Mostotrest. <http://mostotrest.ru>; Vinci. <https://www.vinci.com>.

3.2 What objectives can be addressed by tolls and what objectives by private sector participation?

29. There are many reasons governments may be willing to introduce reforms in the ways roads are funded and operated. These reasons can be grouped into several categories of objectives. Table 4 lists those objectives and shows how tolling and private sector participation fit in dealing with them.

Table 4: Policy Objectives Addressed by Tolls and by Private Sector Participation

Category of Objectives	Objective	Role of Tolls and Private Sector Participation in Attaining the Objective
Funding and/or finance-related	Overcome shortage in government's budget to fund the construction of high-capacity roads.	Private investment can be attracted under a build–operate–transfer (BOT) scheme to overcome the shortage of budget funds. Tolls are the most common and easy option to recover investment and remunerate the private investors. A public corporation may also be capable of channeling private money through government-backed debt to achieve the same objective.
	Overcome a situation where government has closed access to new debt, because of solvency concerns by the financial market or because of the existence of debt ceilings (self-imposed or dictated by other parties).	In this situation, the attraction of private investment under a BOT scheme may be the only plausible option. However, direct tolls to users are not necessarily the only option to repay the private partner. Payments from the government (shadow tolls) could achieve this objective as well since these are not regarded as capital but as operational spending.
	Overcome a situation where budget and/or revenue sources allocated to road maintenance are systematically insufficient to fund existing and expected needs.	This objective can be dealt with through one or a combination of the following measures: <ul style="list-style-type: none"> • To introduce improved efficiency in maintenance contracts (e.g., through performance-based contracts or operations and maintenance concessions). • To increase fuel taxation, earmarking its revenue to road maintenance. • To introduce tolls in whatever form to create an additional source of revenue.
Skills and/or management-related	Overcome a shortage of know-how and technical skills to manage the construction and/or the operations of modern high-capacity roads.	Attracting well-known and specialist companies involved in road construction and operations can help overcome this skills shortage. However, it is to be noted that public–private partnerships (PPPs), and particularly BOT ones, are mostly the domain of financiers and lawyers more than engineers. Governments should not expect major technology transfers from private road operators. On the contrary, governments are strongly encouraged to enhance their own technical capabilities prior to engaging in road PPPs procurement and monitoring.

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Table 4 *continued*

Category of Objectives	Objective	Role of Tolls and Private Sector Participation in Attaining the Objective
Skills and/or management-related	Overcome the resistance to change the roads administration that is too bureaucratic and incapable of allocating resources efficiently.	A higher private involvement in roads construction, operations, and maintenance in whatever form may help to improve the standards of efficiency, value-for money, and responsiveness within the roads bureaucracy. The introduction of tolls may also oblige the roads authority to become more responsive to users' demands.
	Restructure road maintenance carried out by an overstuffed and inefficient government body.	A common practice to deal with these problems is to introduce provisions in the maintenance contracts or concessions with private contractors requiring the reallocation of a part of public sector workers.
Environment-related	Establish the principle of paying for the use of infrastructure to compensate for the externalities of road transport.	The introduction of tolls in whatever form responds directly to this objective. Whether tolls are collected under public or private schemes is less relevant.
	Promote more environment-friendly transport vehicles and habits.	Purpose-oriented toll rates segmentation may favor energy-efficient and less polluting vehicles. Tolls can act as price incentives to reduce the use of private cars in favor of other modes as well. Although it is not impossible that this objective can be pursued under privately operated toll roads, ultimately, there is a clear conflict of interest: government wants fewer cars and the operator, more of them.
Transport-related	Add capacity in already congested corridors separating long distance and local traffic.	The construction of a motorway in a congested corridor will improve service. It is not relevant whether it is constructed by private or public sector financing. The introduction of tolls in the motorway serving long-distance traffic may be appropriate to capture revenue and compensate external costs felt locally. Moreover, long distance drivers are less reluctant to pay tolls than local drivers who may be obliged to make the same journey daily.
	Manage traffic in congested areas.	Smart toll rates segmentation can be used as a price incentive to reduce traffic on peak hours and, thus, managing congestion somehow.
	Improve road safety.	Neither privately operated roads nor tolled ones are necessarily safer. However, the introduction of tolling schemes may positively influence road safety in two ways: <ul style="list-style-type: none"> • Firstly, because road safety will improve if more resources are dedicated to road maintenance via tolls. • Secondly, because tolls may be the only way to finance motorways with separated carriageways, limited number of gates and two-level intersections, which are substantially safer than single-carriage two-lane roads open to their surroundings.

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Table 4 *continued*

Category of Objectives	Objective	Role of Tolls and Private Sector Participation in Attaining the Objective
Economic policy-related	Increase private sector participation in all aspects of the economy.	<p>Some countries may wish to reduce the proportion of public sector participation so their economies become more market-oriented and flexible. Infrastructure and particularly roads are usually attractive sectors to private investors if there is an adequate legal and regulatory environment.</p> <p>When remuneration comes from users (tolls, in the case of roads), infrastructure operators are expected to be more customer-oriented than if remuneration comes from the treasury (shadow tolls).</p> <p>However, there is a risk that private infrastructure operators may not be always as customer-oriented and/or value-adding as expected. Most infrastructure assets tend to be by nature monopolies or oligopolies. Thus, quite often, operating companies become more focused in wooing government regulators than in responding to users' demands.</p>
	Attract foreign investment in the country.	<p>As said above, infrastructure projects may be attractive if the legal and regulatory environment is perceived to be robust, stable, and predictable. Foreign companies will be particularly sensitive to that.</p> <p>Foreign companies may be attracted to deals where political and regulatory risks (those risks more difficult to manage by foreigners) are low. Thus, standard deals such as toll-based concessions may be preferred than more complex deals such as shadow tolls.</p>
	Promote the emergence of national construction and/or infrastructure conglomerates.	Some countries have been quite successful in promoting the emergence of national champions in these fields through ambitious infrastructure schemes funded and financed through PPPs and tolls. Sometimes this policy may involve some kind of barriers to foreign companies in procurement.

Source: Compiled by author.

3.3 Are projects delivered through public–private partnerships cheaper than projects delivered through conventional public procurement?

30. This question has no direct answer since a variety of factors influence the project costs. A PPP project will yield value for money if it results in a net positive gain to society greater than that which could be achieved through any alternative procurement route. Most often, the alternative is the standard public sector procurement and delivery. The methodology to appraise this gain in economic terms is commonly referred to as the “public sector comparator.”

31. The full application of the public sector comparator methodology may sometimes be complex and, quite often, some required inputs are difficult to quantify in a scientific manner.⁵ Table 5 provides an initial approach of how a standard public sector project would compare to a PPP one.

Table 5: Comparison between Public Sector and Public–Private Partnership Delivery of Projects

Factor	Standard Public Sector Delivery	Public–Private Partnership Delivery	Explanation
Time needed to deliver the project	Higher	Lower	Decision-making times in the private sector are usually shorter and controls of project processes stricter.
Standards of quality of the project delivered	Depends		Quality is often related to the technical capabilities within the public sector and its capacity to impose appropriate standards on contractors and operators.
Project overruns	Higher	Lower	Project management is expected to be stricter in private hands investing heavily in the project.
Cost of financing	Lower	Higher	Sovereign debt is usually cheaper than private debt even if some sovereign guaranties are offered.
Remuneration given to shareholders	None	Existent	Equity will expect a much higher remuneration than debt, in part to compensate for project risks. And some of these risks are political and regulatory risks that stem from government itself.
Staff costs	Higher	Lower	Lower costs in the private sector may sometimes reflect lower wages but, more significantly, it usually reflects higher flexibility in managing human resources.
Administration costs	Depends		Governments may think public–private partnerships (PPPs) could relieve them of some burdens in the management and overseeing of roads. However, PPPs are complex procurement processes and require sophisticated capacities for monitoring and regulation.

Source: Compiled by author.

⁵ To learn more, see PPIAF. 2009. *Toolkit for Public-Private Partnerships in Roads & Highways*. <https://ppiaf.org/sites/ppiaf.org/files/documents/toolkits/highwaystoolkit/6/pdf-version/5-22.pdf>.

Setting a Toll Roads Policy

4.1 What are the options available?

32. Prior to engaging in toll road projects, decision makers should clearly identify their objectives and priorities and discuss which type of scheme is more suited to deliver the expected results. Chapters 2 and 3 have provided some guidance to lead this assessment.

33. The two broad issues where consensus within government must be achieved are (i) whether the introduction of a new charge for road usage is acceptable, and (ii) what level of private sector involvement in the delivery of new infrastructure and/or its maintenance is desirable. See Box 7 for an example in the case of Malaysia.

Box 7: Malaysia's Support in the Development of its North–South Highway

Malaysia offers a good example of using an existing road to support the development of new sections as the case of the North–South Highway shows.

The North–South Highway (over 800 kilometers [km] connecting the borders of Singapore and Thailand) was originally conceived as a public sector project and the government built 335 km before the mid-1980s. Then the existing sections were turned over to private operations. The concessionaire received an already operational motorway and the right to toll it in exchange for continuing works up to completion of the whole corridor. Therefore, project, construction, operations, and commercial risks were considerably reduced and the project became more attractive to private investors in a time when toll roads were still a novelty in most of Southeast Asia. From already built assets and actual revenue stream, the concessionaire found it easier to secure finance for the remaining sections, and these were built between 1988 and 1994. In addition, the government backed the concessionaire's loans through concession agreements. However, some of these contingent liabilities materialized during the Asian financial crisis of the 1990s.

The approach used for the North–South Highway reduced the risks for private investors and thus opened the door to other projects. It made Malaysia count with an extensive network of toll motorways, one of the densest in Asia.

However, this approach may have sent a message to the private sector that the government is prepared to take on a substantial slice of the risks. Accordingly, the private sector has been very active sponsoring new toll road projects, sometimes relying on the property market for additional revenue.

Source: ADB. 2000. *Developing Best Practices for Promoting Private Sector Investment in Infrastructure Roads*. Manila.



Automated tollway in Johor, Malaysia. Automated tollways have been operating in Malaysia since 1997. (photo by Lester Ledesma/ADB)

34. The decision to introduce tolls is not an easy one for governments as paying for driving is not popular anywhere. Their introduction will require a previous consideration of alternatives to funding roads as those presented in section 2.4. Serious discussions with stakeholders are recommended if tolls are decided to be options. Stakeholders' participation and communication issues will be discussed in section 4.7.

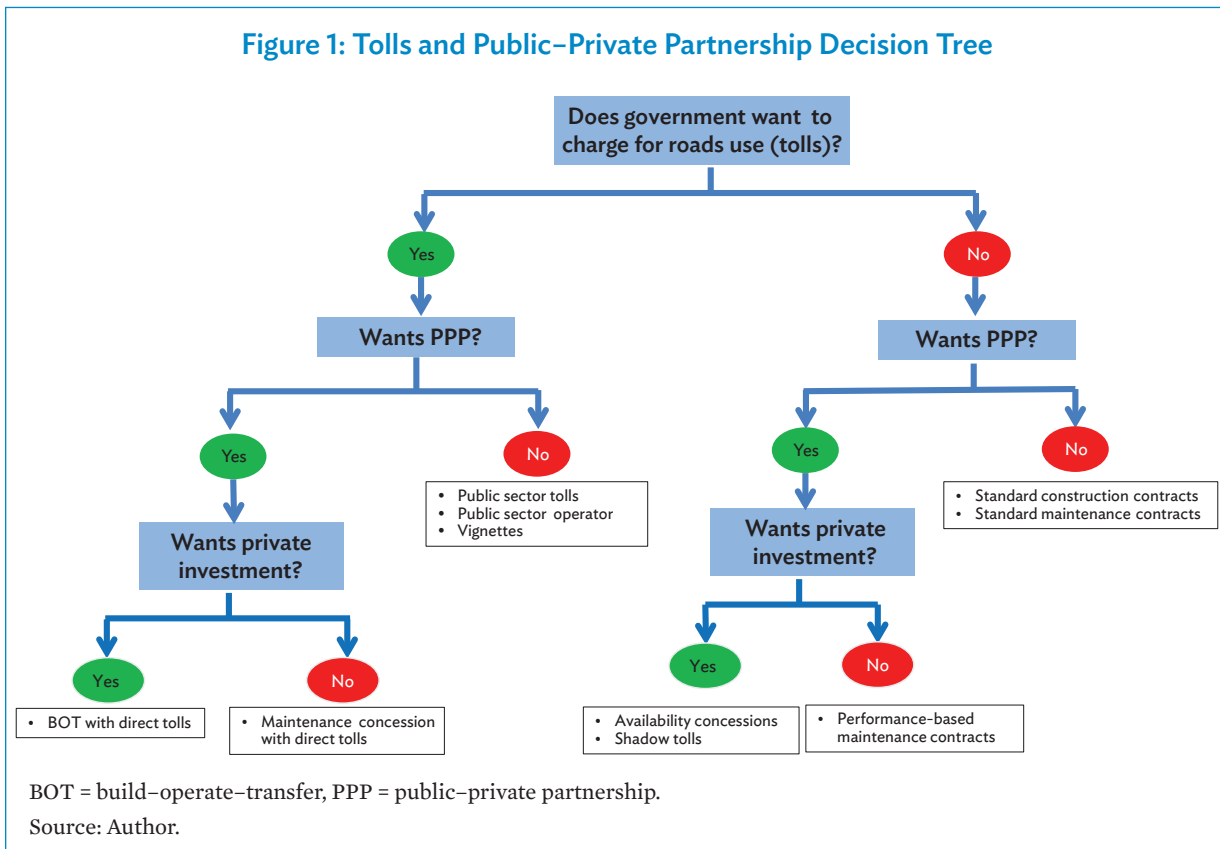
35. Regarding private sector participation, some governments may be more eager than others to engage with private partners because of factors such as ideology, the existence of successful or failed past experiences, familiarity with PPPs, or maturity of the country's banks and contractors.

36. According to the willingness to accept tolls, PPPs, or both, a variety of schemes is available. These are summarized in Figure 1.

37. This guide will deal only with the schemes shown on the left side of the figure. But as can be seen, there are other options available on the right side as well.

38. Quite often, however, the priorities of different ministries (finance, transport, environment, and others) may not coincide. Generally, ministries of finance will be more interested in the capacity of tolls or PPPs to reduce capital and operations spending in the roads sector. Ministries of transport will be more concerned about technical standards,

Figure 1: Tolls and Public-Private Partnership Decision Tree



the mobility implications of tolls, and their effects on the rest of the network. Ministries of transport may also think privately operated toll roads may reduce their capacity to plan and manage the road network.

39. Accordingly, achieving this political consensus will probably require discussions and arbitration at the highest level of government. And the output is likely to combine different sensitivities at a political level that should be carefully assessed to not result in contradictions when the policy is put into practice.

40. Implementing toll road projects may be a complex and time-consuming process. This guide will touch on some of the key questions and issues governments should deal with and to help them avoid the usual pitfalls they may encounter.

4.2 How is it decided what parts of the network should be tolled?

41. Deciding what roads should be tolled and why is a tricky issue. Moreover, not all roads may be suitable for tolling as will be shown in the following sections. Unfortunately, too often, the approach to tolls is more casuistic than systematic, sometimes, as a result of unsolicited proposals (see section 8.4).

42. It is recommended that the introduction of tolls is not addressed through a case-by-case approach, but set out in a long-term strategy reflected in a road master plan produced and discussed with the main stakeholders. Regarding toll roads, this master plan should at least include

- the definition and category of roads that may be tolled,
- the position of toll roads in the network's hierarchy and their relationship with the rest of the system,
- their technical standards,
- overall funding and operational strategy, and
- legal considerations.

43. This master plan should have a broad perspective and it will be better if it covers the whole nation rather than just one part. It is important at this stage to avoid creating unnecessary regional and social grievances that may trigger opposition to tolls (e.g., roads in some regions are tolled while in other regions not for no evident reason, tolls having a disproportionate impact on poor regions or affecting poor sectors of society, etc.).

44. It is strongly recommended that government retains the initiative of deciding what new roads or new road segments are to be built, with what technical standards, for which of these private investment is sought, and where and how tolls will be introduced. This approach will improve the technical soundness of individual toll road projects and its coherence within the network. It will also help setting the negotiations with private partners in the government's terms.

4.3 Should only motorways be tolled?

45. In theory, any road could be tolled. However, the common practice is only motorways are tolled, leaving normal roads free. Indeed, the highest levels of capacity, efficiency, and safety are provided by roads that fulfill some standards commonly accepted as being those of motorways. Unfortunately, many countries cannot afford these standards yet, unless the road is tolled. Thus, quite often, the difference between tolled and non-toll roads is that the former offer motorway standards that allow a faster and safer drive.

46. But what exactly is a motorway? Indeed, there is no harmonized terminology on the subject (see footnote 1). Accordingly, no universal standards for motorways exist and standards may vary according to the geography and other factors. As an example, the technical standards for motorways in the Czech Republic are shown below:⁶

- Two separated carriageways having two or more lanes each
- Minimum designated speed: 100 kilometers per hour
- Intersections at different levels
- Total width: minimum between 22.5 meters (m) and 25.5 m
- Driving lane width: 3.75 m
- Paved shoulder width: minimum 2.5 m
- Inner guiding strip: 0.75 m
- Median width: minimum 3 m

4.4 Should an alternative free road always be granted?

47. The issue of the alternative free road is complex with major implications for the acceptability and coherence of toll road schemes. Sometimes, the compromise to grant an alternative free road appears as a compensatory measure to offset opposition to toll roads that do not take into consideration all the implications and side effects.

48. **The theoretical functions of the alternative free road.** The rationale for a free road stems from three types of functions it is expected to perform. These three functions usually appear intermingled but are different in nature:

- First, a competition-related function: as will be discussed later, an alternative free of toll road is expected to limit the monopoly position of the toll road operator in a given corridor.
- Second, a social function: a free alternative road is seen as a safeguard to ensure mobility to the poor (or to those unwilling to pay tolls).
- Third, a mobility function: when the toll road has limited access gates, another (free) road has to be in service to provide local access and short-haul mobility.

49. **How the alternative road appears in practice.** In practice, there are two typical types of situations (Table 6):

⁶ These standards are derived from the Czech Republic's standards for roads. See CESKEDALNICE. Categories of Roads. <http://www.motorway.cz/categories>.

Table 6: Approaches to Motorway Design and Construction and Their Implications to the Free Alternative Road

The free alternative is the old, existing road	The new road is superposed to the old one
<p>The new high-capacity toll road is built following a different alignment from the “old” road. Thus, the old road becomes naturally the free alternative and provides local accessibility between gates in the new road. This situation allows for a neater introduction of tolls. If the toll road is awarded to a private operator, it will expect the capacity of the old road is not substantially enhanced to a level it may challenge its traffic and financial expectations.</p>	<p>The new high-capacity toll road is built adding a second carriageway to the existing one and following most of the time the same alignment. In this case, no “old road” will result as a natural free alternative, except for the sections where the new one has followed a different alignment. Moreover, the new road will most often keep the same intersections as the old one, except when collectors are built in its laterals. The introduction of tolls in this kind of roads will be trickier since the new road will have no alternative, no reduced number of gates, and no complete insulation. These situations are rather common in developing countries since adding a new carriageway is much cheaper than building a brand-new motorway.</p>

Source: Compiled by author.

50. **Considerations stemming from theory and practice.** Stemming from the functions expected to perform the alternative free road and from what may happen in practice, some further considerations are suggested:

- The mere existence of an alternative may be the result of the approach used to build the new road rather than the application of any principle.
- Granting a free alternative may be conceptually incompatible with the application of the “user pays principle,” especially when toll revenue is dedicated to other public objectives (e.g., road maintenance, public transport, etc.). In this case, the mere existence of a free alternative is against the government’s own principles and interests.⁷
- Sometimes, traffic along a corridor may not be heavy enough to sustain a tolled highway and a parallel free road. Insistence on granting a free road risks making the expected high capacity new one unattractive to private investment. Providing both options with public money may be a waste of resources.
- When the toll road operator is a government entity or a public corporation, the competition considerations do not apply.
- Concerns about the effects of tolls on the poor or on local residents may be dealt with by other means such as waivers, discounts, etc.

51. Should an alternative free road become a citizen’s right? The key question is whether a free road in any corridor should be granted as a right to citizens and enshrined in legislation. Countries have provided different answers to this question:

⁷ In Colombia, where tolls have been introduced in most corridors, no free alternative is required. Local authorities often put equivalent tolls on roads under their jurisdiction that could provide an alternative.

- In many countries, the answer has been “yes” and thus, governments are bound to ensure that some sort of non-payment option is offered in corridors served by a toll road (e.g., France, Morocco).
- In other countries, the approach has been more pragmatic. The principle is accepted as government practice, but is not written in any piece of legislation (see Box 8 for the case of Spain).
- Finally, in other countries the answer is “no.” Their governments made it clear they have no other option than tolls to extend, improve, and maintain their road networks (see Box 9 for the case of Colombia).

52. The decision on whether the alternative free road is given as a right to users is of paramount importance and may imply major and long-lasting effects on toll road policies. If this right is enshrined in law, removing it may demand a great deal of political courage and consensus. Thus, the recommendation is that prior to making a hasty decision, all considerations are weighed from a long-term perspective.

4.5 Can traffic diversion be managed?

53. Traffic diversion to free alternatives is a typical side effect of introducing tolls. Sometimes, traffic diversion may have some of the following unwelcome effects:

- Without sufficient demand, the toll road project may be unattractive to potential private operators, and thus, private investment is at risk. Or when the road is already in operation, the toll road operator may be systematically struggling for survival.
- The diverted traffic may put too much pressure on second tier, local roads not prepared for intense traffic, thus causing congestion and damaging the roads. The road conditions may be aggravated if a substantial proportion of diverted traffic is heavy vehicles.
- Residents and businesses along the roads used by drivers unwilling to pay tolls may complain about the hassle or insecurity caused by the diverted traffic.
- Traffic diversion plays against the government’s intention to channel most or all long-haul traffic and/or heavy vehicles through the high-capacity toll road.

54. Limiting the diversion of traffic may be a tricky issue as it is directly correlated with the subject of exclusivity rights awarded to a toll road operator and the position of government regarding a free alternative.

55. In practice, authorities can use a variety of measures to manage traffic diversion without challenging fundamental principles and rights such as:

- Speed limits, roundabouts, traffic lights, speed bumps, rumble strips, and other traffic pacification measures discourage long haul traffic and heavy vehicles from using local roads.
- Direct prohibition of heavy vehicles from local roads, except for deliveries.

Box 8: Toll Motorways Become Gateways for Exports and Growth in Spain

Spain approved a National Motorway Plan in 1967 aimed at building 3,160 kilometers (km) of motorways. This came after the World Bank's recommendations to improve road connectivity along its Mediterranean front to facilitate transport between Spain's major industrial areas and European markets. Insufficient budget funding at that time obliged the government to pioneer with build–operate–transfer (BOT) projects for motorways in Southern Europe and the first section started operations in 1972.

The early introduction of toll motorways and BOT projects in a relatively poor country by western European standards of that time, with long distances and low densities, was crucial to facilitating exports (first of agriculture products, later of industrial products as well) and to fostering economic growth. It also triggered the emergence of a strong sector of infrastructure operators, most of them spin-offs from construction companies that have become major world players.



AP7 motorway in Spain. The AP7 was the first toll motorway in Spain and has become the country's main gateway for exports to Europe. (photo by Ignasi Ragas)

However, as the Spanish economy grew and the country became eligible for European Union grants, government started to build free motorways as well. By 1985, there were 1,807 km of toll motorways plus 643 free ones. By 2011, toll motorways were 3,300 km and free ones were 12,900 km. Some of the free motorways were funded under “shadow toll” schemes.

Not keeping a consistent approach on tolled and free motorways through time led to some inefficiencies and grievances across the country. Regions where the first toll motorways were built feel aggrieved for having to pay, whereas roads are free in other regions where motorways are more recent. Hence, sometimes political pressure mounted so that a free motorway would be built along the same corridor of an existing tolled one, although there is no obligation by law to provide free alternatives to toll roads.

Source: Author.

Box 9: Colombia Learns from Four Generations of Toll Roads

Colombia is a big and rugged country, featuring high Andean sierras, great rivers, and thick Amazon forests that contribute to making road connectivity within the country a major challenge. There have been publicly owned toll roads in Colombia for many years. Users do not expect “free alternatives” along major corridors as this is often simply impossible. Even two-lane roads may be tolled. In past and more turbulent times tolls were even levied by insurgent groups that controlled some areas of the country, rather than by government.

From the early 1990s, the country engaged in subsequent waves (locally known as “generations”) of concessions for roads and other infrastructure assets, even without having a proper concession or public–private partnership (PPP) law. Each of these generations was conceived after learning from successes and failures from previous ones.

The government launched the first generation of road concessions in 1992. It envisaged the construction of 230 kilometers (km) of new roads, and the rehabilitation and maintenance of 1,486 km of other roads. The estimated investment was \$869 million. At the time, the government had little experience in PPPs and rushed the signing of contracts even before completion of land acquisition and obtaining environmental clearances. Contracts did not set procedures to deal with disputes and renegotiation nor clear rules for payment of guarantees. In addition, the government did not evaluate the financial solvency of bidders that resulted in some awarded companies failing to secure financing. This first generation was characterized by delays in implementation, renegotiations, cost overruns, and payment of higher than expected guarantees. Despite the drawbacks, the project permitted the country to improve its roads in a way government alone would not have afforded to do in times of economic and security hardship.

The second generation of road concessions was launched in 1997–1998 with two contracts consisting of 353 km for rehabilitation, 178 km for new construction, and 975 km for maintenance, with a global investment estimate of \$504 million. The main award criterion was the expected income for the concession holder, thus, duration was not fixed. This time, the government improved the engineering designs and technical specifications as well as demand studies to reduce overruns. In addition, in 1998, a new law established a Contingent Liabilities Fund to receive contributions from all concession holders to create a cushion for government and limit its exposure to contingent liabilities.



Motorway Medellín–Cartagena. The motorway connecting the cities of Medellín and Cartagena is one of the toll highways in Colombia. (photo by Ignasi Ragas)

continued on next page

Box 9 *continued*

The third generation was launched between 2001 and 2004. It consisted of 10 contracts for a total of 1,772 km and expected investment of \$930 million. Engineering designs, technical specifications, and the matrix of risks allocation were further improved. The awarding was simplified with the only criterion being the expected amount of revenue.

In 2006–2007, a fourth generation was launched and has been deployed in various waves up to the present, even including some private sector-initiated projects.

In the beginning, the government roads agency, Instituto Nacional de Vías (INVIAS), organized most concessions. However, after 2011, the Agencia Nacional de Infraestructura was created as a specialized body to procure PPP projects in any sector, thus leaving INVIAS in charge of roads under public sector management.

Toll roads have allowed Colombia to assure reliable connectivity to most of its major urban areas and ports even in difficult times. Learning by doing permitted the government to improve substantially its technical and regulatory capacities, thus becoming a serious and predictable partner to the private sector.

Sources: ADB. 2000. *Developing Best Practices for Promoting Private Sector Investment in Infrastructure Roads*. Manila; CAF. 2010. *Infraestructura Pública y Participación Privada. Conceptos y Experiencias en América y España*. Cámara Colombiana de Infraestructura; Instituto Nacional de Vías. <http://www.invias.gov.co>, Agencia Nacional de Infraestructura. <http://www.ani.gov.co>.

4.6 Is it advisable to use toll on urban motorways and ring roads?

56. Tolls in high-capacity roads serving or crossing major cities are very common. As cities and motorization grow fast, congestion in urban roads has become a major problem. Many cities see privately financed urban motorways as the only option to increase road capacity. However, it is to be noted that introducing tolls in urban roads may also create some perverse side effects. Table 7 describes some arguments for and against tolling urban motorways.

57. What has been said at the national scale applies as well to the urban and metropolitan scale. The introduction of toll roads in urban and metropolitan environments should be viewed from a comprehensive perspective that takes into consideration several factors such as public transport, circulation and parking, and land zoning, etc.

Table 7: Arguments for and against Tolling Urban Motorways

Arguments For	Arguments Against
<ul style="list-style-type: none"> • High-capacity roads designed to alleviate congestion in urban environments are complex and expensive works, usually beyond the financial reach of local authorities. • High-traffic demand in cities and metropolitan areas make urban motorways an attractive investment. They may be more attractive to private investment than intercity corridors with lower traffic. • Tolls may be used to discourage the use of cars and encourage public transport. 	<ul style="list-style-type: none"> • The diversion of traffic created by tolls may further aggravate congestion in secondary non-toll roads. • The introduction of tolls may distort the objective of a ring road that is to funnel crossing traffic away from the city as users unwilling to pay may keep on driving across it. • Residents in areas served by the motorway may complain about paying tolls for local mobility. • Tolls may create boundary effects affecting the attractiveness for business and housing of areas before and after toll barriers. • Adding capacity in roads bound to the city will lead to pouring still more cars into inner-city streets that may already be incapable of providing enough space for circulation and parking.

Source: Compiled by author.

4.7 How can concerns and opposition from users and stakeholders be dealt with?

58. Tolls are not an easy concept to sell. And less so in places unfamiliar with the very notion. There are still many countries with extensive networks of high-capacity roads where tolls are virtually nonexistent⁸ and in some of these countries, the issue has become politically charged (see Box 10 about South Africa's opposition to e-tolls). Thus, it is recommended that governments willing to introduce tolls do not underestimate this challenge.

59. In a broader sense, it is important to understand the differing needs of users based on different social factors. Thus, a social and gender assessment of the users should be done to fully capture these nuances which, in the long run, will impact on the acceptance and sustainability of the tolling scheme that will be implemented.

60. Some tips are suggested for dealing with concerns and opposition to tolls, and building a broad consensus in their favor:

- A consensus should be reached within the government before communicating outside. The message from government should be monolithic.
- Set the discussion on tolls from a broad perspective: capacity and investment challenges, budgetary limits, need to address other social needs, etc. Introduce in the discussions other options such as petrol taxes. Insert the issue of toll roads into a long-term transportation strategy, not just to raise revenue.

⁸ Direct tolls are virtually nonexistent in countries such as Germany or the United Kingdom (although in Germany, a vignette for heavy vehicles has been introduced and one for light vehicles is planned). Only a small fraction of high-capacity intercity roads in the United States are tolled, although the number is increasing.

Box 10: Opposition to E-Tolls in South Africa

The Gauteng Freeway Improvement Plan, a scheme to improve motorways in South Africa's Gauteng province, linking the country's powerhouse Johannesburg with the capital city, Pretoria, and Ekurhuleni, was launched in 2008 and aimed to be completed by FIFA's World Cup in 2010. The scheme faced some time overruns (it was not finished until 2011) and cost increases (the initial estimate of South African rand [ZAR] 6.4 billion increased to about ZAR18 billion). The scheme was implemented by the government-owned National Roads Agency (SANRAL) and envisaged the introduction of electronic tolls (e-tolls). SANRAL failed to obtain sufficient endorsement from local authorities and civil society organizations which resulted in a tortuous path to implementation and widespread opposition to the scheme.

One of the main targets of public anger was the complexity of the scheme that required users to register for the electronic tolling. In addition, some of the municipal jurisdictions affected refused to adopt the regulatory framework to sanction defaulters. This situation meant that nonpayment became widespread among users. South Africa has developed a wide network of toll motorways, some of them managed by SANRAL and other managed under private partners' concessions. Although not reaching the level of confrontation found in Gauteng, tolls are not popular in South Africa.

Sources: South African National Roads Agency. <http://www.nra.co.za>; Organization Undoing Tax Abuse. <http://www.outa.co.za>.

- Be transparent when private participation is envisaged. Show it is government, not private interests, who is leading. Be clear about financial issues that may arise from PPP schemes.
- Be honest about the advantages brought by new infrastructure financed through tolls. If possible, quantify them. It will be easier to make users buy in if it is apparent that the advantages offset the cost of tolls.
- Any government documentation issued in this subject should be clear, fact-based, and informative. Not just publicity aimed to convince.
- Engage as many stakeholders as possible: business associations, trade unions, consumers' associations, opposition in parliament, subnational governments, etc. Try to educate them, not just to convince them. Identify their concerns and try to address these seriously.
- Pay particular attention to the stakeholders likely to be more affected by tolls such as transport companies, professional drivers, and local residents. Be sure the implementation of tolls will not bring unnecessary grievances.
- Do not make promises and make rash decisions that could have undesired consequences (e.g., see the alternative free road issue above).
- A broad consensus will make the policy become consistent along time. Changing the approach to toll roads every few years is counterproductive.

5

Setting Up an Enabling Legislative Framework

5.1 What legislation should be in place to ensure solid foundations for toll roads?

61. A wide variety of legislation may influence to some extent the practical applicability of toll road schemes. When toll road projects involve PPPs and substantial private investment, a robust, stable, and predictable legislative framework is essential. And they will require complex procurement, contracting, and monitoring procedures.

62. Thus, a thorough assessment of the nation's legislation is recommended to ensure no major obstacles hinder the applicability of toll roads and that no major issue is left to improvisation.

63. Some of the most relevant issues affecting toll roads are discussed in this section. Not all topics are of equal importance. While some issues may need drafting or modifying legislation, others may just require adjustments in second level regulations or the inclusion of some provisions in contracts.

5.2 What enabling reforms in road sector legislation are recommended?

64. The list below shows some topics that should be addressed in road sector legislation to enable toll roads:

- Produce a clear definition of motorways and/or of the types of roads susceptible of being tolled.
- Describe the procedures to procure and implement toll roads.
- Describe the general requirements of toll roads operators.
- Describe the roles and functions of different administrative bodies and other stakeholders.
- Describe the rights and obligations that apply to individuals as well as to other government bodies (e.g., an interdiction to cut direct access to motorways applies not only to owners of neighboring properties, but also to local authorities when planning urban developments or when issuing building permits).

65. These topics may be addressed through the piece or pieces of legislation governing roads (a "Roads Law") or through a specific "Toll Roads Law."

5.3 How can exclusivity rights and competition issues be dealt with?

66. Exclusivity rights and competition issues are common concerns for authorities regarding toll roads. This is a consequence of the intrinsic monopolist nature of infrastructure in general, aggravated by the exclusivity rights sought by toll road operators if they are to invest the huge amounts of money to build a high-capacity motorway.

67. Exclusivity rights themselves may be against competition laws and be challenged in competition courts. Even if some sort of exclusivity right proves to fit into the country's legal system, the extent of these may be open to interpretation. The tricky part is to establish up to what point the government can bind itself so as not to facilitate competing infrastructure or compensate the operator for the reduction in revenues if it fails to keep its commitment.

68. Monopoly and competition issues are difficult to balance and get right. A too rigid approach to them risks scaring off many potential private investors and leaving the country without much needed infrastructure. A too accommodating approach risks attracting opportunist investors and may cause serious and long-term harm to users and residents along a corridor.

69. To mitigate the potential adverse effects of this monopolist positions, it is also recommended to introduce effective, professional, and impartial regulation and monitoring mechanisms to defend general and users' interests. (See more on regulation and monitoring in section 6.2.)

5.4 What issues should be addressed to ensure toll payment?

70. Tolls may be a new concept in the legislation of countries not familiar with them. Since they are the main source of revenue for the operator, a clear and comprehensive regulation will avoid risks of conflicting interpretations.

71. Tolls are not usually considered as taxes but as regulated prices. Considering their nature, the following issues should be addressed:

- the nature of toll road operators and legal base that allows them to collect money from users;
- the authority of toll collectors (e.g., staff collecting tolls) to enforce toll payment;
- procedures and penalties for nonpayment or fraud;
- procedures to approve toll revisions and mechanisms of economic regulation;
- capacity of toll road operators to implement commercial schemes (e.g., toll segmentations by type of users, time-based segmentations, loyalty schemes, etc.);
- toll payment waivers (e.g., police, emergency services, local residents, etc.); and
- tax regime of tolls (e.g., applicability of value-added taxes and other taxes).

5.5 Is a public–private partnership law a prerequisite for toll roads?

72. No. Indeed, the existence of specific PPP legislation is not a necessary precondition for successful PPPs in other fields. In fact, countries with long experience in PPPs, such as the United Kingdom, do not have a specific PPP law.

73. However, if toll roads are expected to be financed through PPPs, the existence of regulations governing PPPs at the highest level possible provides reassurance to prospective private investors, especially international ones. This may be even more relevant in countries with little or no experience in private delivery of public services and infrastructure. In some countries, especially in those with a legacy of centrally planned economy, the very notion of private provision of public services and the delivery of infrastructure may not be properly legislated, and both legislators and government officials may not be familiar with it.

74. Rules governing PPPs for toll roads may be either covered in specific PPP legislation, in specific roads legislation, or in both. What is important is that regulations in both laws are not contradictory. The level of detail of rules in PPP legislation should be the result of a trade-off between certainty and flexibility. However, in some countries, the approach to PPPs has been that of negotiating a contract (after a public tender or not) and, once signed, sending it to parliament for ratification and elevation to the category of law. This may be an effective approach and provides the highest level of reassurance to the private parties. However, these shortcuts may cause serious concerns about transparency, equal treatment, and good governance to citizens and toll road users.

Putting in Place the Appropriate Governance and Skills

6.1 What capabilities and technical skills are required to implement toll roads?

75. Typically, roads administration is the domain of engineers. The implementation of toll roads is a more complex endeavor than designing roads, supervising their construction, and organizing their maintenance. It requires integrating knowledge in other fields such as:

- **Finance and business.** Knowledge in these will be needed to ensure projects are feasible and backed by solid financial structures.
- **Legal.** Complex procurement and contractual arrangements will be needed, and formal monitoring and regulation functions should be performed after the project is awarded.
- **Communication and customer relations.** The introduction of tolls will require dealing with concerns and opposition from users and some stakeholders. Moreover, once tolls are collected, road users become customers and that require a more customer-oriented approach than what is common in public administration.

76. These skills will be needed irrespective of the type of toll the road operator envisaged. However, skills in finance and law will be more critical when using PPPs that require careful assessment of the business case, project risks, and procurement methodology. Moreover, contracting and regulating authorities need to be prepared to face senior and experienced lawyers and financiers sitting on the private sector's side of any negotiation table. Prior to engaging in toll roads, governments should assess realistically whether they have the capacities and skills to draft contracts, and procure and monitor these projects.

77. Toll roads are not significantly different from other regulated markets with private provision of services. Thus, particular attention should be paid to avoid situations that may debilitate the position of government as guarantor of public interest such as:

- Monitoring and regulation bodies being captured by vested interests from the toll road operator or from among other relevant stakeholders.
- Skilled public sector staff and senior politicians being hunted by private companies seated at the opposite side of the table, offering them higher salaries and perks.

6.2 What organizational and governance structures should be set up?

78. Preparing, implementing, and monitoring toll roads is more complex and interdisciplinary than what is common for standard roads. Thus, the standard structures at

the ministries of transport or public works or at roads authorities may be insufficient or ill-prepared to deal with these projects.

79. The various structures and functions along the project's stages are summarized in Tables 8–10:

Table 8: Structures and Functions at Preparation Stage

Type of Structure	Description	Functions
Toll roads unit	It should be an interdisciplinary and more or less autonomous unit, typically at the ministry governing roads.	<ul style="list-style-type: none"> • Assessment of tolling options. • Preparation of business cases. • Assessment of project risks. • Financial analysis. • Selection of the procurement method. • Selection of the bid evaluation criteria and proposing the bid evaluation committee. • Drafting the tender documents and contract.

Source: Compiled by author.

Table 9: Structures and Functions at Implementation Stage

Type of Structure	Description	Functions
Bid evaluation committee	It may or may not be formed by members of the toll roads unit. The second option ensures greater independence.	<ul style="list-style-type: none"> • Evaluation of bids. • Proposal of preferred bidder. • Handling and resolution of claims for revisions or challenges from unsuccessful bidders.
Toll roads unit		<ul style="list-style-type: none"> • Final negotiations with the preferred bidder; preparation of relevant documents for the signature of contracts. • Supervision of the engineering design and preparatory studies and works. • Coordination between the operator and the relevant government bodies for permits and approvals. • Supervision of construction works. • Preparation of the certificate of works' completion and acceptance.

Source: Compiled by author.

Table 10: Structures and Functions at Operations Stage

Type of Structure	Description	Functions
Technical monitoring body	Usually an autonomous unit within the ministry responsible for roads. It may have evolved from the previous toll roads unit, so staff is familiar with the project from the beginning.	<ul style="list-style-type: none"> • Supervision to ensure compliance with the standards set in the contract (technical, performance, safety, customer service, quality, etc.). • Calculate penalties and enforce correction of shortcomings. • Supervision of the operator's books to check if any toll revision or any other contract change is justified. • Interpretation of the contract in the first instance. • Interlocution for the day-to-day issues between the authority and operator.
Economic regulation authority	It may be the body in charge of competition and the proposal of price bands in regulated markets (e.g., electricity, water, telecommunications, etc.) or be a specific regulator for toll roads. Usually these bodies are independent commissions set up by the legislators or semi-independent units related to the ministries of economy or finance.	<ul style="list-style-type: none"> • Approval of toll rates bands. • Final decision on claims and competition issues.

Source: Compiled by author.

6.3 What structures should be set if the option is a public sector operator?

80. When the selected option is that the toll road will be operated by a public undertaking, the route shown above may change somehow as no tender to select an operator will be made. On the other hand, however, it is recommended that thorough consideration of the financial and governance structure of the undertaking is made. Some recommendations for this are listed below:

- The operator should have full financial muscle to carry through the tasks assigned to it. Its equity and financial structure should not be significantly less than what would be requested from a private operator.
- It should have the capacity to operate as an efficient and profit-seeking business undertaking.
- It should not have unusual burdens or be requested to reach unattainable goals.
- A clear and balanced set of rules should be set to govern the relations between the operator and government. In particular, the relevant bodies at the roads authority should have the capacity to supervise and accept works, monitor maintenance standards, and enforce the correction of shortcomings.

- It should adopt international standards regarding accountancy and reporting, and be audited by independent bodies.
- It is desirable that its board of directors include independent members who are experienced in business. The board should be shielded from political interference in its operations.
- Specific attention should be given to toll collection and revenue management to avoid bad practices such as pilfering of toll revenues, unjustified absence of collectors from their booths, inappropriate or impolite behavior to customers, etc.

Assessing and Preparing Toll Roads Projects

7.1 Is the proposed toll road the best option? Have other options been considered?

81. Even if a broad consensus on tolling and PPP exists, the introduction of tolls may not be the best option for any given road. Hence, it is recommended that the decision to introduce tolls is not automatic even if the conditions and criteria for tolling have been set in a nationwide road master plan. This means authorities should make sure that:

- The nature and characteristics of the road make it suitable for tolling (e.g., roads with too many intersections may be impractical for tolling, adding toll booths in already congested roads may aggravate congestion, etc.).
- The diversion of traffic caused by tolls will not create undesirable problems for the rest of the network.
- Other options that might produce a better outcome have been explored. This may also help to convince reluctant stakeholders.
- That tolling does not bring major undesirable side effects to the economy as a whole or to a particular strategic industry.
- Appropriate measures to mitigate or compensate negative impacts are identified, that they will be applicable in practice, and will produce the expected results.
- Toll revenue will offset toll collection costs and be sufficient to justify the tolling option.

82. An adequate assessment of the characteristics and risks posed by the proposed toll road should be made before the project is given a green light. And all implications should be fully understood and introduced in the evaluation matrix.

7.2 Has the affordability of the project been properly assessed?

83. Affordability is the capacity to pay for building, operating, and maintaining the project through its life span.

84. If the public sector is funding the project, it can be considered affordable if the public expenditure associated with it can be accommodated within the public sector's budget ceiling over time. If the private sector is funding the project, it can be considered affordable if the expected revenue from tolls exceeds the expected investment and operating costs, and provides a return on investment attractive enough compared with the risks incurred by the sponsors.

85. The affordability of a toll road depends basically on four factors, two from the cost side (i.e., amount of investment and financing costs) and two from the revenue side (i.e., level of traffic and toll rates). Based on that, some of the elements that may negatively affect the affordability of a toll road project are illustrated in Table 11:

Table 11: Elements Causing Negative Impacts on the Affordability of a Toll Road Project

Elements Affecting the Cost Side	Elements Affecting the Revenue Side
<ul style="list-style-type: none"> • Expensive works such as tunnels, bridges, or causeways, drive up costs and may challenge the affordability of the project. These works are also more prone to overruns. • On the other hand, projects that involve little up-front investment (e.g., maintenance concessions) are more affordable. • More expensive works will involve more financing costs in a feedback process. • If there are many risks affecting the project that will increase financing cost. • High interest rates. • The project receives little support from financing institutions and/or insufficient guarantees. 	<ul style="list-style-type: none"> • Little traffic in the corridor. • Irregular traffic patterns or patterns susceptible to change. • The users' motivations to use the road are not strong. They may stop using it or use other alternatives to avoid tolls. • The period of time awarded to the operator is insufficient to recoup capital costs. • Toll rates are set at too low levels for political or other reasons.

Source: Compiled by author.

86. When governments seek private investment for complex and expensive projects, they may be requested to offer some safeguards (e.g., grants, guarantees, exclusivity rights, minimum granted income, etc.). If these safeguards are too onerous, that might be a symptom that a PPP is not the most appropriate way to deliver the project and even that the project itself makes little economic sense.

7.3 Are demand forecasts robust?

87. Sound traffic forecast is crucial in toll roads (privately or publicly operated). Most countries and almost all multilateral financial institutions require demand analyses before giving a green light to new road projects. However, examples abound of traffic forecasts overestimating actual traffic levels. This is referred to as the “traffic optimism bias.”

88. These overestimations may be the effect of traffic modeling flaws or inaccurate assumptions. One common flaw is that the economy's intrinsic cyclical nature is not considered. Another common flaw is the illusion of unlimited growth, i.e., motorization forecasts that do not envisage a “ceiling” or expect this ceiling to be the motorization levels in the most developed countries. Motorization growth will more likely have an “S” shape with rapid growth followed by a slower one as the ceiling is approached.

89. Optimism bias may also reflect the interests of actors involved in the decision process. They may be those of the sponsors and/or contractors interested in being awarded the construction and operation of a toll road or those of politicians and/or decision makers who use inaccurate demand studies to underpin a politically based decision.

90. The consequences of too optimistic traffic demand forecasts may be that the operator demands contract renegotiations, asks for higher toll rates, contract time extensions, or financial compensations. At worst, the operator may default without even finishing the works. Then the government may find itself with incomplete works, and be bound by unforeseen liabilities facing the financiers.

91. A common recommendation is that traffic forecasts made by banks that are financing the project—which are expected to be more cautious and free from other interests—are taken into consideration to balance other existing studies.

7.4 How should toll rates be set?

92. The general principle is that tolls should be set at a level that allows the recovery of capital expenditure and operations expenditure within a reasonable period of time and with an acceptable retribution to the sponsors. Based on this logic, toll rates should be directly correlated to the costs of building and operating the infrastructure and to traffic levels. What a “reasonable period of time” should be is further discussed in section 7.7.

93. The retribution of sponsors will vary greatly, reflecting the sponsor’s nature (public, private, or mixed) and the private investors’ perception of the project risks. When there are no private sponsors in the operator’s equity (i.e., it is a public undertaking), a prudent approach is to set retribution to capital at the level of financing costs at least.

94. Is the previous approach sufficient? No. As always in infrastructure projects, there are two approaches to their feasibility: the economic return approach and the financial return approach.

- (i) The **economic return** approach looks at the broad economic impact of the infrastructure to the nation’s economy and society.
- (ii) The **financial return** approach will look at the return to the sponsors that the infrastructure may generate.

95. Thus, toll rates should be set in a way that an appropriate balance between both approaches is reached. It may not be always easy since these are often contradictory:

- Higher toll levels will augment the financial returns of the operator, especially if it is in a strong monopolistic position (i.e., no free alternative exists or the country is poor). If an alternative exists, high tolls will reduce the use of the toll road. Both situations will lead to reducing the toll road’s global economic return to society.
- Although low toll levels may seem to maximize the global economic return, too low rates may make the project unaffordable or lead the operator to default.

96. The next section (7.5) provides some ideas to overcome the situation where toll levels are insufficient to recover project costs.

97. Another essential question is identifying what toll levels would be acceptable to users. In theory, a rational user will be willing to use a toll road instead of a free alternative, provided that it exists, and if tolls offset the additional time and costs incurred when using the alternative. Thus, most feasibility studies correlate the willingness to pay to the time savings after the project is operational and the average income per head in the area. Nevertheless, the attitude of road users to being tolled varies and so does their willingness to pay. Thus, toll revenue depends on several cultural, social, and behavioral factors not always easy to discern. Some of these are illustrated in Table 12:

Table 12: Social and Behavioral Factors Impacting on Toll Revenue

Type of user (professional and/or personal)	The ratio of time to money is more relevant for professionals. Thus, professionals are more prone than individuals to make “rational” decisions.
Purpose of trips	Time is more relevant for trips to or from work than for leisure or personal trips (visiting friends or relatives).
Frequency of trips	Commuters that use the same road every day may be very sensitive to costs. Tolls may be affordable for occasional drivers, but not for regular ones.
Familiarity and social acceptance of tolls	Tolls will be easier to accept by people already used to paying for infrastructure. People from urban areas may be more familiar than people from rural areas.
Level of income of users	High earners will be more willing to pay tolls than the poor. In countries with high social imbalances, willingness to pay is concentrated in the top end and that means that toll roads may have a reduced customer base.
Time	Willingness to pay tolls may change with time and this is important for projects with a long life span. In general terms, willingness to pay will increase as time passes as users become more affluent and become more familiar with tolls.
Politics	Tolls may be seen as a government imposition and their avoidance is meant to convey a political message.

Source: Compiled by author.

98. In conclusion, it is recommended that when setting toll levels, other factors than just the recovering of investment costs be considered and accurate willingness to pay assessments are made.

7.5 What if tolls are insufficient to cover project costs?

99. It may happen that demand and willingness to pay analyses show the expected revenue from tolls is insufficient to cover the cost of a particular project. Or it may happen that broad economic returns are maximized to a point where the financial profitability of a particular project is not reached.

100. There are two groups of measures to overcome this situation: project enhancement measures and systemic or network measures. Finally, a pragmatic approach is also possible. These are enumerated below:

101. **Project enhancement measures.** Some of the most common of these measures are the following:

- Reduce the cost of financing, for instance, by looking for more funding from subsidized loans, grants, or guarantees provided by donors or international finance institutions, such as ADB.
- Government takes some of the project's costs (e.g., land acquisition, preparatory works, junctions with other roads, etc.) to reduce the up-front investment cost borne by the sponsor.
- Government takes a share in the equity of the sponsor of the toll road. Also, most international financial institutions have some dedicated funds that can invest in equity.

102. Project enhancement measures mean the government or donors take some of the costs and/or risks associated with the project to reduce the costs and/or risks borne by the sponsor of the toll road.

103. **Systemic or network measures.** These measures involve extracting revenue from some parts of the network to subsidize one or various projects that prove difficult to finance. These may take several forms:

- *Cross subsidies.* Tolls are set at national or network level so profits from road segments that are cheaper to build cross-subsidize more expensive segments. This is simpler when all toll roads in a country are operated by a single company (e.g., a public corporation). If this is not the case, it becomes more complex and it may require some sort of clearinghouse at the national level.
- *Tolls.* Tolls are introduced in already built and non-tolled parts of the network (preferably along the same corridor) to subsidize the construction of a new segment. It may be a solution in cases when the expected revenue from just a missing section in a corridor that requires huge investment (a mountain section, a tunnel, a causeway, etc.) proves to be insufficient (or tolls are unacceptably high).
- *Vignettes.* As mentioned, vignettes may be an option to distribute costs among all drivers.

104. **Pragmatic approach.** A pragmatic approach could be summarized thus: “better collecting something than nothing.” A government willing to build a particular infrastructure (or just to rehabilitate and maintain it) may deem it absolutely practical to recover part of the costs incurred via tolls, whether they are publicly or privately operated. Obviously two conditions should be met: that the global economic return is not severely reduced by tolling, and that revenue clearly offsets the costs of toll collection.

7.6 How can toll segmentation address other objectives?

105. Tolls can be tailored to address other social, traffic, or environmental issues. A variety of toll segmentation schemes have been experienced in this field. Here are some examples:

- **Toll segmentation per type of vehicle.** The more widespread type of segmentation is between light and heavy vehicles, the latter facing higher fares to reflect the additional damage these vehicles cause to the road's surface.
- **Toll segmentation for social considerations.** Some governments apply schemes to reduce toll fares to vulnerable groups such as students, low-income citizens, etc. These schemes are sometimes tricky to implement as they may leave room for abuse or inappropriate compliance. Another approach may simply be to exempt small motorbikes from paying.
- **Residence-based segmentations.** Toll reductions and waivers may be offered to local residents in the vicinity of a toll road who need to use it for daily short trips.
- **Vehicle-occupancy segmentation.** High occupancy vehicles may get a discount and/or dedicated lanes to encourage a more efficient use of the infrastructure. There is no universally accepted definition of a high occupancy vehicle, but it is typically 2+ or 3+ people.
- **Toll segmentation per time of the day or day of the week.** Higher toll fares at peak times may have an impact in reducing congestion. This type of segmentation is used in many access roads to metropolitan areas. Also, fares may be higher on weekends and low working days.
- **Toll segmentation to favor “green” vehicles.** A smarter and environment-oriented approach is to levy higher fares to more polluting vehicles. This approach is experienced in some metropolitan areas that have implemented “low emission zones.”⁹
- **Loyalty programs.** These are typically promoted by highway operators, not by governments, as a commercial incentive to regular users such as commuters. It may happen that regulation or concession contracts do not allow this practice as it can be perceived as discrimination among users.

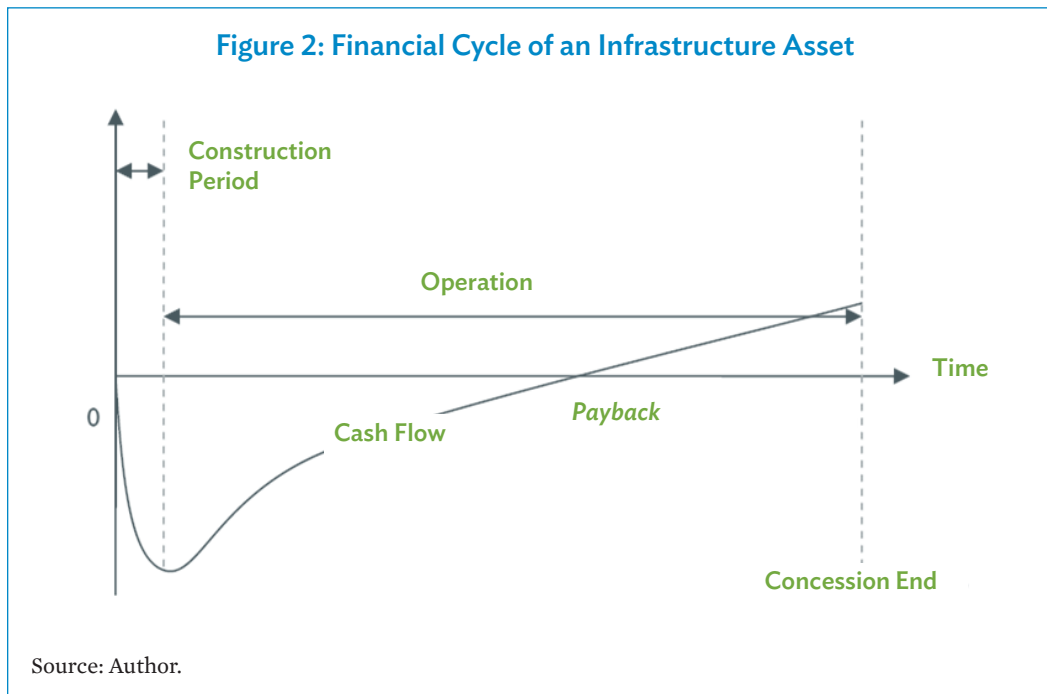
106. The introduction of toll schemes to address congestion and environmental issues is becoming more frequent. This is clearly the way ahead: “**smart tolls for smarter and greener mobility.**”

7.7 What should be the duration of contracts?

107. The general principle is the period should be set to allow investors to recover capital and operations expenditure and allow an acceptable retribution to equity. This is a relevant issue when toll roads are financed via PPP.

108. Figure 2 shows the life cycle of any infrastructure asset. Cash flows will be negative during the initial period from construction to payback. After that, it will be positive. Normally, the higher the amount of up-front investment, the longer the time needed for payback.

⁹ To learn more about “low emission zones” in Europe, see: European Commission. Urban Access Regulations in Europe. <http://urbanaccessregulations.eu/low-emission-zones-main/what-are-low-emission-zones>.



109. Accordingly, projects that involve the construction of new infrastructure, such as BOT projects, need longer periods, typically no less than 20 years. In most countries, concession periods are capped at somewhere between 35 and 50 years. Longer periods make little sense in the private sector since no financial institution is going to finance for such long periods. Financing for periods longer than 20 years are most often only possible with government-backed bonds.

110. On the other hand, projects that involve little up-front investment, such as operations and maintenance concessions for existing roads, can be awarded for shorter periods (typically no more than 10 years).

111. However, projects in real life are not as simple as the figure above suggests. In practice, private sponsors will most often structure their financing in a way that allows being profitable at the early stages of operations as the private sponsors may benefit from grace periods and because repayment of debt escalates across time. This creates an illusion of profitability that can be used by opponents to tolls to lobby government to shorten the concession period or to retaking control of it. If government succumbs to these pressures, both actions are likely to trigger private operators' demands for compensation and may eventually lead to litigation.

112. A smarter approach to contractual periods is setting a target of accumulated net revenue instead of a date in the calendar. The contract period ends when this target is reached. This approach was experienced in Chile (Box 11) and is becoming more common.

Box 11: Chile's Evolving Procurement Approaches

Traffic risk mitigation is arguably the aspect in which the Chilean motorway concessions evolved the most. From the very beginning, most concessions included a minimum income guarantee for 70% of the investment cost plus the total maintenance and operation costs at present value. If the concessionaire decided to take the minimum income guarantee, however, it had the obligation to share part of the revenues obtained whenever real traffic was higher than expected.

A further step in traffic risk mitigation took place in 1998, when the Government of Chile introduced as an awarding criterion the sum of total revenues to be obtained by the project. Thus, the concession would end when the discounted flow of revenues reached the amount offered by the winner. In this sense, the mechanism was not only a procurement procedure, but a way of mitigating traffic risk. It was used again in three more concessions some years later.

In 2000, the government allowed renegotiation of all previously granted concessions, mainly due to the recession experienced by Chile's economy from 1998 to 2002, which produced a substantial decrease in traffic in all motorway concessions. Another reason was the need for additional investment in many of the motorway concessions. The mechanism selected, called the "Revenue Distribution Mechanism," guaranteed the concessionaire would receive a pre-fixed amount of revenues (at present value). Thus, the duration of the renegotiated concession shifted from being fixed to being variable. In exchange for the guarantee of extra revenues, the government required the concessionaire to carry out initial investments, which were calculated by the government as the difference between the present value of the revenues guaranteed and the present value of the revenues expected.

Thanks to a smart approach to risk allocation and the robustness of its legal framework, Chile has been the most advanced Latin American country in motorway concessions. From 1992 to 2010, the government granted 33 motorway concessions, totaling 3,328 kilometers. A portion of these are urban motorways across the country's capital, Santiago, a step that has encountered some criticism.

Sources: Corporación Andina de Fomento. 2010. *Infraestructura Pública y Participación Privada. Conceptos y Experiencias en América y España*; D. M. Ruffán Lizana. 2002. *Políticas de Concesión Vial: Análisis de las Experiencias de Chile, Colombia y Perú*. CEPAL. Santiago; Government of Chile, Ministry of Public Works. <http://www.mop.cl/Paginas/ingles.aspx>.

7.8 What to do when the infrastructure is paid? Should toll collection be stopped?

113. Should tolls be eliminated when the concession period is finished and the infrastructure is handed over by the private sector to the conceding authority? If the operator is a public corporation, should tolls disappear after repayment of the last outstanding bonds?

114. There have been various approaches to answer these questions:

- A first approach is governments decide they should stop collecting tolls since the main justification for its introduction has disappeared. This approach was taken for some roads in Japan and the United States. However, this approach is taken less often because governments are increasingly more cash-strapped.
- A second approach is that tolls are kept under different arrangements (sometimes reducing fares) to ensure the revenue stream from them can be dedicated to the

maintenance of the road and, if there is a surplus, can be dedicated to other objectives. As drivers become used to tolls, this approach becomes more common.

- A third approach is renegotiating with the operator an extension of the contract adding new works under its umbrella (e.g., adding new lanes, building new road sections, etc.). These contract extensions may be triggered either by authorities willing to obtain new investment, or by the operator willing to carry on with the business beyond the initial contract period. These types of contract extensions are common practice but create concern as these tend to not be transparent, distort competition, and entrench the incumbent operator's market position. The highest possible transparency and the ability to show real value for money may mitigate these concerns.

115. Our recommendation is that decisions on toll elimination (the same as those on toll introduction) be made looking at a broader framework and not in a case-by-case approach. If government is willing to extend the user pays principle, eliminating an existing toll would be a step backward and send a mixed signal to users.

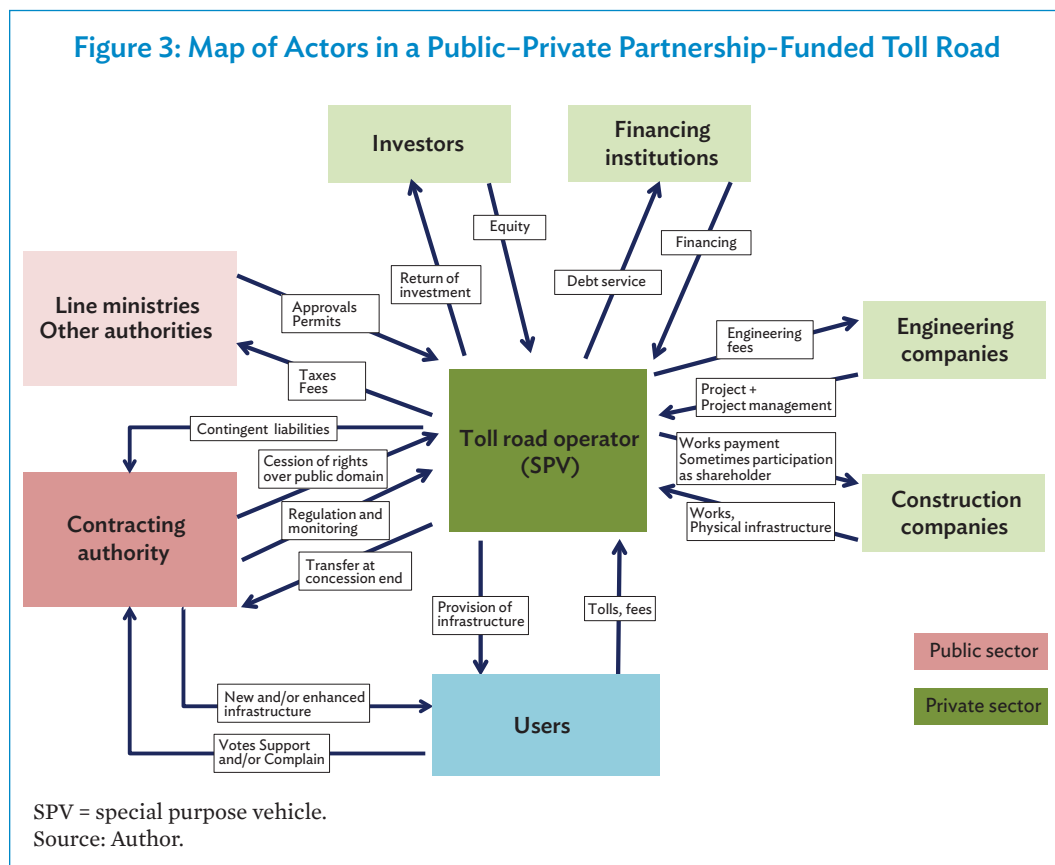
Looking for the Right Partners

116. Attracting the right partners and binding them to fulfill their commitments to build, fund, and operate a toll road for a long period is paramount if the project is to be developed under a PPP scheme. This section will mostly deal with PPP-funded toll roads.

117. However, some partners discussed in this section, such as financing institutions, engineering and construction companies, and users are relevant for public-funded projects as well. Some, if not most, of the recommendations in this section may also apply when the sponsor is a public or public-private undertaking.

8.1 Who are the key actors in a toll road project?

118. Projects financed under a PPP scheme, such as a BOT, involve a great variety of actors whose interests and motivations need to be fully understood. They are illustrated in Figure 3.



119. First we have the **government**. The government is not monolithic. There will be a **contracting** authority that should respond to the objectives and criteria of the ministries with higher involvement in the project (finance, transport, and others). Line ministries and other authorities (local and regional) may also have a voice in matters such as permits and approvals. It is recommended that the contracting authority stands clearly as the key authorized government interlocutor facing all private partners. Enhanced coordination within government at all levels is also recommended to avoid delays in project delivery, and cost overruns.

120. The **toll road operator** will typically be a company called, in financial jargon, a **special purpose vehicle** or **SPV**. The SPV will be formed by capital contributed by **investors** (sometimes referred to as sponsors) eager to risk their own money in the project. The SPV will reflect the stakes of each partner in its equity. One of the purposes of the SPV is to limit the exposure of investors in the project to the value of their stakes. The SPV is usually the contracting counterpart of the government.

121. The major source of financing of PPP projects is debt in whatever form. Most projects will typically be financed on a **project finance basis**, which means **financing institutions** need to be reassured the project will generate enough revenue to repay debts on a stand-alone basis. The borrower will be the SPV and, as mentioned before, its shareholders will be ring-fenced from financial obligations against third parties. The debt–equity ratio in this kind of project is typically somewhere between 70:30 and 80:20. Although financing institutions are key players in the success of a PPP, usually they do not have a direct contractual relation with the contracting authority.

122. The SPV should contract with **engineering and construction companies** to deliver the infrastructure on time. Quite often, construction companies have stakes in the SPV and may play a double role as sponsors and as providers of civil works.

123. Finally, **users** are key players. They are expected to benefit from the provision of new infrastructure. Their behavior will impact the toll road operator in the form of more or less revenue than expected (i.e., the commercial risk), and also impact government in the form of political support or complaints.

124. As shown in Figure 3, the construction and operation of toll roads involves a web of contractual relations, administrative procedures, and financial flows among various partners. Hence, it is important that the interests and motivations of all partners are well understood. As complex schemes, PPPs need to be founded on appropriate legal and regulatory frameworks (see section 5) and appropriate governance and technical skills (see section 6).

8.2 What are the typical risks associated with a toll roads project and how to allocate them?

125. Risk assessment and allocation are fundamental issues in privately financed projects and influence the overall project costs. The higher the risks perceived by investors, the higher the remuneration they would expect for their equity and, generally, the higher the financial costs.

126. Any PPP involves the principle that risk sharing is accepted by all parties. This may be a cultural challenge in some administrative environments where the mere notion of risk is not clearly understood. Authorities with little experience in PPPs may make inadequate assumptions about the risks transferred to the private side that may lead to increasing costs and, eventually, to an unsuccessful tender.

127. Risks can be grouped into the following main categories:

- **Country risks** are linked to the country, such as political instability and legal and regulatory uncertainty. Legal and regulatory risks can be derived from decisions by the contracting authority or decisions from other authorities. Delays, uncertainties, and costs associated with permits and clearances required to move the project forward fall under this category. Thus, coordination among all involved public bodies is required to minimize the latest.
- **Economic and financial risks** impact directly on the availability and cost of financing the project. They may be related to monetary and/or currency exchange rates, monetary stability and inflation, economic growth and other macroeconomic variables, stability of the financial sector, etc.
- **Project risks** are associated with cost and time overruns. They may be caused by inadequate project preparation, difficulties in land acquisition, unanticipated environmental or geologic issues, social opposition, poor design, construction delays, inappropriate project management, labor issues, etc.
- **Commercial risks** impact the actual revenue collected in relation to forecasts. They may stem from inaccurate traffic forecasts, unexpected reactions from users, unexpected changes in the economic environment, alternative routes being opened, alternative modes of transport becoming more attractive, expected developments (residential, commercial, leisure, industrial, ports, airports, etc.) being delayed or cancelled, etc.
- **Operations risks** are related to overruns in the operation of the facility. They may be derived from unexpected variations in labor, costs of materials, and other inputs, adverse weather or natural conditions, unexpected traffic patterns (e.g., the effects of more heavy goods vehicles than expected on roads' surface conditions involves more maintenance costs).
- **Force majeure risks** relate to the impacts in the normal operations of the infrastructure of extreme and unforeseen events beyond the control of any party such as natural disasters, war, civil disturbances, etc.

128. The main principle for successful PPP projects is that risks are allocated in a way **that every party takes the risks it can actively manage or offset**. Thus, government should reasonably bear most country risks whereas private partners should reasonably bear most financial, project, and commercial risks. Nevertheless, some risks such as force majeure cannot reasonably be controlled by any of the public or private parties and in these cases, some kind of risk sharing may be necessary.

129. Risks can be mitigated by insurances or guarantees. Some private and multilateral institutions such as the ADB have developed a range of instruments to enhance project feasibility by mitigating risks.

8.3 How is commercial risk managed?

130. In toll roads, commercial risk is probably the most substantial one and close attention to this subject should be paid in all stages: project preparation, designing tender conditions, negotiation with prospective operators, and, finally, economic regulation.

131. The general principle is commercial risk should fall on the private side in a PPP, unless the government changes unilaterally the existing market conditions. If reliable and independent demand and willingness to pay analyses were made at the project preparation stage, these should set a solid basis for assessing the commercial risks likely to be borne by the private side. Unrealistic demand assumptions may lead to project failure or may attract opportunistic bidders that count on later renegotiation of contracts, as will be discussed in section 9.3. Having said that, we have seen so far that many factors influence demand and, thus, some room for flexibility should be made possible.

132. Private partners may sometimes demand that a minimum amount of revenue is granted. This will reduce significantly the commercial risk borne by a private operator and, in general, is not recommended. However, these demands may be acceptable in some circumstances, if a private company's delivery of the infrastructure still brings other advantages compared with traditional project procurement.

8.4 How are the most appropriate partners engaged?

133. Identifying serious and non-opportunistic partners is crucial for a smooth project delivery and to ensure relations between the government and the toll road operator are not systematically conflict-ridden. Some questions about how to engage the appropriate partners are discussed below:

134. **Should equity targets be set?** Yes. Higher equity will strengthen the financial structure of the operator and make investors more committed to the project. In general, the debt–equity ratio should not be lower than 80:20. However, too high ratios may discourage investors as they may perceive they are exposed to unacceptable risks.

135. **Should minimum participation targets be set for nationals in the shareholding?** The participation of nationals may bring some advantages such as familiarity with the political, regulatory, and socioeconomic environment. Foreign investors are likely to engage national partners without any formal obligation to do so. However, if these targets are perceived as being a protectionist barrier or a subterfuge to engage politically related companies, they may deter serious and vetted international investors and thus be counterproductive.

136. **Should changes in shareholding be allowed after a contract has been awarded?** Changes in the shareholding structure after a bidding process may imply modifying substantially the nature of the awarded operator. In this sense, requesting a commitment of permanence for a minimum time seems reasonable. Moreover, changes in the shareholding structure in the early stages (e.g., before the contract and financial close or before the finalization of works) may have more substantial effect than in later operational stages.

137. **Should government be a minority shareholder of the toll road operator?** The reasons governments request a minority stake are diverse. In some cases, it is envisaged to complement private investment to achieve a stronger equity. In other cases, it reflects the contribution of government (e.g., land, complementary works, etc.). Finally, government may simply wish to have an ear, a voice, and maybe a vote in the board of directors. Having the government within the operator shareholding may have some drawbacks that merit careful consideration:

- Being a joint venture, the operator may become obliged to follow some public sector rules regarding procurement, accountancy, labor relations, etc. that may reduce its flexibility.
- There will be no neat separation of functions between regulator and operator.
- Board directors appointed by the government may find themselves in a conflict of interest.

138. Another question is when a government corporation or a joint venture bids in direct competition with other full private companies. That is a distortion of fair competition and may lead to other bidders abandoning the process.

139. **Should conditions for financing be set?** Most often there will be no direct contractual relation between the contracting authority and the pool of institutions providing loans to the operator. Thus, no conditions about who finances should be set. That may change if financiers are granted “step-in” rights, which means their right to take the position of the operator in case it goes bankrupt or fails to repay its debts.

140. Another question is setting conditions about the quality of debt and, in particular, if there is some kind of government backing. Here conditions need to be clearly set and government needs to fully understand the risks and liabilities it may face if things go wrong.

141. **Should conditions be set for contracting national construction companies?** Governments may be sensitive to national contractors' claims to be granted a substantial participation in the construction of a new high-capacity toll road. A major toll motorway is also an opportunity for national companies to acquire valuable know-how in such projects. In any case, governments should be honest about whether national companies are capable of providing the adequate technical standards and can act coherently.

142. **Should unsolicited proposals be accepted?** Receiving unsolicited proposals from private companies is something most governments face at some time. Sponsors of these proposals may be actively lobbying key decision makers, legislators, or stakeholders to build a broad coalition in favor of their initiative.

143. Unsolicited proposals are not bad in themselves. They may reflect the capacity of the private sector to identify an opportunity where government has not. However, governments should always be cautious as unsolicited proposals may be made by unscrupulous actors that may risk little if the endeavor goes ahead. The following tips are recommended for governments facing unsolicited proposals:

- Gather as much information as possible from and about the companies proposing the deal. Check their experience and track record in toll roads.

- Challenge their studies and forecasts critically.
- Gather independent studies. Look for independent advice. Multilateral banks such as ADB may help in this.
- Check if the proposed project is coherent with the country's road master plan (as discussed in section 4.2), and if not, what its implications will be.
- Carefully check the implications to government of the proposed deal: direct cost to government, financial liabilities, monopolistic position of the operator, variables that could be difficult to monitor and control by government (e.g., foreign companies building the road under foreign or untested technical standards unfamiliar to national roads engineers and road administration staff), etc.
- Government should try not to lose the initiative in the preliminary discussions: setting the timing and the agenda.

144. Finally, a decision should be made whether an open tender is to be called or direct negotiations with the sponsors should go ahead. An open tender will always be the most transparent way of dealing with unsolicited proposals and will favor government and users' interests.

Procuring for the Best Outcome

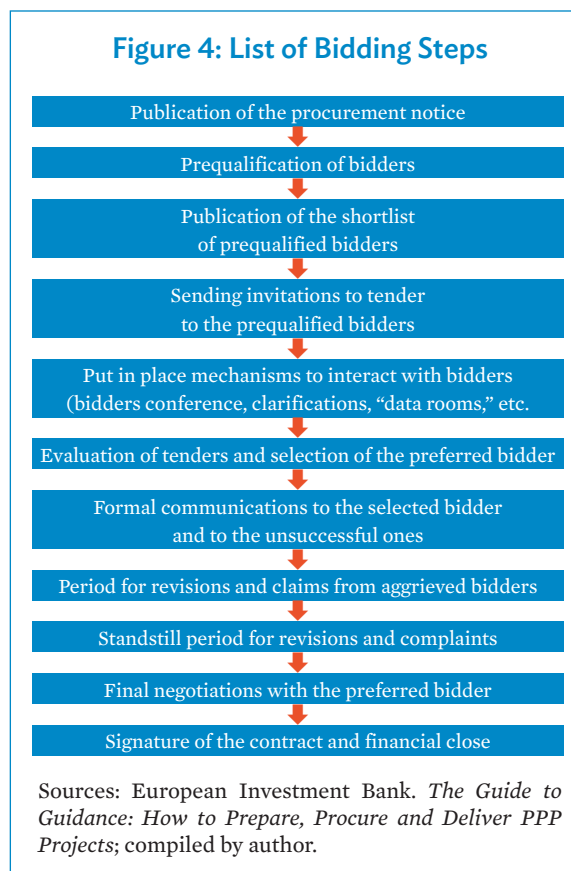
9.1 How should the bidding process be organized?

145. When government decides to involve the private sector in a toll road project, a bidding process needs to be established to introduce competition and transparency in the awarding of the rights to exploit a public domain and to charge users.

146. The goal of the bidding process is to maximize the value for money by creating the appropriate incentives through a competitive process. The proper handling of procurement is crucial to reduce both

- (i) the risks of litigations that could delay the implementation of the project, and
- (ii) the risks that opponents of the project may derail it.

147. Procurement for a toll road under a PPP scheme is a complex, time-consuming, and costly endeavor for both the contracting authority and the bidders. That is why shortlisting is a common practice. The typical bidding steps are illustrated in Figure 4.



9.2 What evaluation criteria should be used?

148. Various evaluation methodologies have been experienced. They may vary according to countries' procurement practices and to the characteristics of particular projects. It is relevant to underline that the evaluation criteria used to select the preferred bidder will affect the criteria used to regulate the contract in its lifespan.

149. Ideally, the simpler the methodology of evaluation—even if it is based on a single criterion—the more transparent and less risky it is regarding claims from other bidders.

Also, the inclusion of many criteria does not make only evaluation trickier but also future regulation.

150. Some of the possible evaluation criteria are as follows:

- The minimum support for government (or alternatively, the highest fee paid to it) from a set toll level.
- A price-cap approach, wherein the government awards the contract to the company offering the lowest toll levels.
- A cost-plus approach, wherein the government awards the contract to the company that offers the lowest construction + operation cost, which in principle should involve the lowest toll rates if they will be set under a cost-plus approach.
- The evaluation criteria are based on the accumulated net revenue of the operator, from a fixed toll level.

151. No single methodology can be recommended for projects with different backgrounds and serving different markets. The evaluation criteria should reflect the government's balance between two somehow conflicting objectives of the toll road: minimum government cost and minimum toll level.

9.3 How are opportunistic bidders dealt with?

152. Contracting authorities should be attentive to prevent opportunistic bidders from submitting proposals that are too aggressive, taking for granted immediate renegotiation after being awarded the contract. Thus, they are encouraged to introduce filters in the bidding process so disproportionately low bids are discarded unless they can fully prove the robustness of their assumptions. Requirements that bidders prove technical and/or commercial competence are also helpful.

153. In real life, however, these filters are not always easy to manage and opportunistic bidders may find a way to overcome them. Even competent and well-known operators may be tempted to bid aggressively if they perceive the gamble may secure contracts that can be renegotiated later. Again, the best firewalls against opportunistic bidders are (i) having robust demand and willingness to pay for studies before starting the bidding process and (ii) counting on skilled staff able to identify inconsistencies in bids.

9.4 What topics should a contract for a toll road include?

154. Contracts for privately operated toll roads are lengthy and complex documents. The complexity is accentuated if the private party is expected to invest great sums of money in new infrastructure. In cases of lesser investment (e.g., operations and maintenance concession of a preexisting road), contracts will be much simpler.

155. Contracts between the contracting authority and the toll road operator should at least cover the following topics:

- procurement procedures;
- clear description of rights and obligations of each partner;
- principles and/or formula determining the economic and financial equilibrium for the operator;
- period of contract, conditions for extension;
- conditions regarding project approval, works delivery, and their acceptance by the contracting authority;
- conditions regarding road maintenance (e.g., stipulations on services to be delivered, performance indicators, equipment to be deployed, etc.);
- conditions for the operating company (e.g., type of company, type and nationality of shareholders, minimal debt–equity ratio, rules regarding conflict of interest, etc.);
- rules regarding consumers' rights and obligations;
- information to be provided to the contracting authority;
- procedures and bodies in charge of technical monitoring;
- procedures and bodies in charge of fare revisions and economic regulation;
- procedures and penalties in case of default by one of the parties;
- which kind of legislation will govern the contract (i.e., standard commercial laws, special administrative laws, specific ad hoc legislation);
- conditions and rules for contract renegotiation, including changes in the competitive environment (e.g., a new parallel road);
- procedures to deal with disputes;
- rules in case of insolvency of the operator;
- conditions and procedures for contract termination;
- conditions and procedures for handover; and
- contractual guarantees.

9.5 How to deal with contract renegotiations?

156. Renegotiation of contracts is common in privately operated toll roads as the intrinsic long duration of contracts make it impossible to forecast all possible circumstances from the outset. Thus, contract renegotiation should be made possible by law and by the contract itself. However constant contract instability is to be avoided, so the events that may trigger renegotiations and contract amendments should be clear and detailed. It is also recommended that the renegotiation of contracts is made in the most transparent way compatible with the operator's legitimate privacy.

157. Recommendations on how to deal with some of the most common causes of contract renegotiations are discussed in Table 13.

Table 13: Recommendations for Contract Renegotiations

<p>Changes in legislation or in the regulatory framework</p> <p>New regulations from government bodies create a different environment that challenges the operator's financial equilibrium.</p>	<p>Government should discuss openly with the operator the effects of these changes, preferably through independent or mutually accepted assessment.</p> <p>It may happen these changes are triggered by government bodies with different views from the contracting authority (e.g., local authorities). Here, intergovernmental coordination and compromises should be sought.</p>
<p>Changes in toll levels</p> <p>Sometimes changes in government or other political reasons lead to toll freezes, toll reductions (in general or just for some types), or change the structure of tolls (e.g., to accommodate to environmental criteria).</p>	<p>Governments should acknowledge when they trigger unilateral changes in the contractual conditions that the operator may request some sort of compensation.</p> <p>These compensations may be expensive and perhaps other approaches to tackle the problems could be cheaper.</p> <p>Finally, unilateral changes send a negative signal to investors that they may become more cautious or unwilling to enter into deals with government. This will make attracting private money for other projects more difficult and costly.</p>
<p>New infrastructure is added under the umbrella of the concession</p> <p>Either the authority or the operator may propose to add new infrastructure to the concession package (new lanes; further extending the road, new gates, or junctions, etc.).</p>	<p>These additional works will involve compensations, typically contract extensions. As discussed in section 7.8, the highest possible transparency and the ability to show real value for money are recommended.</p>
<p>Wrong assumptions</p> <p>Some of the key assumptions that supported the business case prove to be wrong. Most often this relates to overestimated traffic forecasts or underestimated construction costs.</p>	<p>Governments should do their best to avoid finding themselves in the difficult position of deciding whether to impose on the operator to fully assume its assumptions or to accept renegotiation to prevent the debilitated company from jeopardizing delivery of the project. How to deal with opportunistic bidders is discussed above (section 9.3).</p>
<p>Force majeure</p> <p>Extreme and unforeseen events beyond the control of any party such as natural disasters, war, civil disturbances, etc. may cause severe impact on the operator's profitability that could hardly be anticipated when drafting the contract.</p>	<p>As no part is responsible for the events that have impacted on the operator's performance, a certain degree of sharing costs and risks should be found.</p>

Sources: World Bank. *Toolkit for Public-Private Partnerships in Roads and Highways*; Washington, DC; compilation by author.

10

Avoiding Pitfalls in Project Implementation and Delivery

10.1 Have all pitfalls to implementation been considered?

158. The itinerary to the implementation of toll road projects may be long and complex. Some of the major questions and issues regarding project preparation and procurement were already discussed. However, several other pitfalls may cause delays, cost overruns, or derailment that are synthesized in Table 14.

Table 14: Potential Pitfalls in Project Implementation

Type of Issue	Description	Level of Criticality
Land issues	<p>Is the land for the project available?</p> <p>Has government activated the mechanisms for voluntary and compulsory acquisition of land, right of way, and for resettlement?</p> <p>Will land acquisition be completed when the project starts?</p> <p>Are there outstanding claims or lawsuits regarding land acquisition?</p>	High
Project approval and permits	<p>Does the project count with all approvals and permits?</p> <p>Are all relevant government bodies coordinated and supportive?</p> <p>Indicative list of authorities involved in the approval of a road project:</p> <ul style="list-style-type: none"> • Authorities in charge of roads • Authorities in charge of land planning • Authorities in charge of archaeology and cultural heritage • Authorities in charge of environment protection • Authorities in charge of water and rivers protection • Authorities in charge of state property (land purchases and expropriation) • Authorities in charge of road safety • Authorities in charge of work safety during construction stage • Bodies responsible for any affected infrastructure (railways, electricity and telephone lines, water and oil pipes, etc.) • Local planning authorities, regional and municipal councils 	High

continued on next page

Table 14 *continued*

Type of Issue	Description	Level of Criticality
Company and commercial issues	<p>Are there specific limits and regulations that may influence the operators' incorporation and normal business?</p> <p>Indicative list of issues:</p> <ul style="list-style-type: none"> • Liabilities of the owners • Responsibilities of the directors and administrators • Regulations concerning conflicts of interest. • Mandatory capitalization ratios (see section 8.4). • Required particular statements of purpose in the company charter • Foreign investment regulations • Foreign exchange laws; restrictions on profit repatriation • Courts and jurisdictions in case of litigation • Tax regulations and tax incentives • Accounting standards applicable 	Medium
Environmental issues	<p>Have all the studies and permits required for site selection and project definition been made and approved by the relevant authorities?</p> <p>Were the required environmental standards applied in construction?</p>	Medium
Road-related issues	<p>Were specific road signs applicable to toll roads approved? In particular, signs informing that it is a paying road?</p> <p>Were arrangements made with the roads police to patrol the toll road?</p>	Medium
Labor issues	<p>Are there requirements of local recruitment and/or restrictions on hiring foreign staff?</p> <p>Were recruitment regulations on gender and/or other social groups taken into consideration?</p> <p>What are the conditions for hiring and releasing staff?</p> <p>How should labor relations and strikes be handled to avoid interruption of service?</p>	Low^a
Intellectual and industrial property issues	<p>Will intellectual property rights for technologies protected under patents or industrial property (e.g., tolling systems) be respected?</p>	Low
Tort issues	<p>Were responsibilities in case of unintended personal injury or damage to third parties assessed and procedures to handle them prepared?</p>	Low

^a Importance may be high if the operator is required to deal with maintenance using its own staff or to eventually take a portion of personnel previously under the government's payroll.

Source: Compiled by author.

10.2 How should project design and construction be monitored and works accepted?

159. Awarding the construction and operation of a toll road to a third party (the operator) does not discharge roads authorities from their monitoring and approval functions. Indeed, they should keep the functions but learn to perform them with a different approach.

160. Although it will be better to perform monitoring and supervision with in-house people, e.g., the toll roads unit, the volume and complexity of the task concentrated in little time may overwhelm its staff. In these cases, outsourcing to experienced professionals may be an option.

161. Here are some guides for the different phases of project implementation (Table 15):

Table 15: Tips for Roads Authorities Monitoring and Supervision at Various Stages of Project Implementation

Project Delivery Steps	Tips for Roads Authorities Monitoring and Supervision
Engineering design and preparatory studies	<ul style="list-style-type: none"> • Make sure the design complies with the country's approved road standards and with those stated in the contract.
Construction	<ul style="list-style-type: none"> • The focus should be on what will be achieved, not on how it will be achieved. • Although in principle construction risks should be borne by the operator, it would be wise to keep an eye on potential cost overruns to anticipate eventual contract renegotiations. • Make sure the contractor provides interlocutors capable of having technical discussions with the authority's supervisors. This is critical when foreign companies carry out construction. • Changes occurring during construction need to be fully documented and approved.
Works completion and acceptance	<ul style="list-style-type: none"> • The contractor should provide full as-built documentation to the roads authority. • The certificate of works completion and acceptance on similar document does not mean the authority is not responsible for pursuing the contractor to mend any construction or design faults, nor for maintenance.

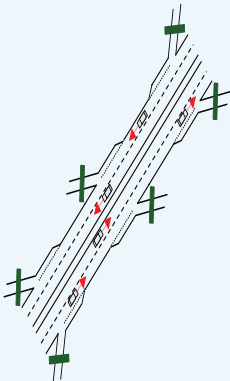
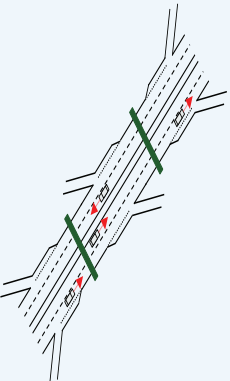
Source: Compiled by author.

Designing and Managing Toll Roads

11.1 Open or closed tolls?

162. A key question when designing a toll highway is the position of toll collecting points, i.e., whether it should have open or closed tolls. A summary of the two options is shown in Figure 5.

Figure 5: Short Description of Closed and Open Tolls

Closed Tolls	Open Tolls
	
<p>Toll collection points are located at each of the road's gates of access. Ideally this system requires that there are no other entry and exit points than the gates where toll collection points are situated, the highway is fenced off from other roads and tracks, and there is no possibility for U-turns once one enters the trunk.</p>	<p>Tolls are located on the trunk at several intervals. To ensure 100% capture of traffic, tolling points should be located between a pair of entry and exit points. However, in practice, the decision to opt for open tolls is often based on the idea of reducing toll collection costs by placing a smaller number of tolling points. In these cases, the operator calculates that the reduction in collection costs offsets the reduced share in captured traffic. Open tolls are also the only practical option when it is impossible to insulate the highway from its vicinity.</p>

Source: Compiled by author.

163. The decision about the most suitable option should take into consideration the following advantages and disadvantages (Table 16):

Table 16: Advantages and Disadvantages of Closed and Open Tolls

	Advantages	Disadvantages
Closed tolls	<ul style="list-style-type: none"> • It is a fairer system since it is easy to measure the distance traveled. • It reduces the risk of congestion on the trunk as vehicles do not need to slow down and stop to pay. • Long distance travelers only need to stop at the entry and exit points. 	<ul style="list-style-type: none"> • It involves higher investment and operations costs as more tolling points are required. • Higher investment and maintenance cost is also required to insulate the highway from its surroundings. Moreover, ensuring complete insulation may be difficult and fences may be vandalized and cut open.
Open tolls	<ul style="list-style-type: none"> • It is less costly in investment, operation, and maintenance costs. • It is easier to implement. • This may be the only option to introduce tolls in already existing roads. • Open tolls are often the only practical option to toll access roads to major cities or roads in urban environments. 	<ul style="list-style-type: none"> • It is less fair since it is more difficult to correlate payment to distance traveled. • There is a potential loss of revenue since 100% of traffic may not be captured if the road is not fully insulated. • There is higher risk of congestion inside the trunk. • Long distance travelers will need to stop at several points. • They may create boundary effects. This means travel patterns and location decisions on housing and setting up businesses are affected by the position of the tolling point. Areas beyond the tolling point become less attractive for business and housing, and land prices go down.

Source: Compiled by author.

164. Having in mind these pros and cons, closed tolls are the recommended option for greenfield motorways that are part of long distance corridors and are conceived as a separate project from the existing road, following a different alignment. Accordingly, its conception should include a reduced number of intersections and insulation from its surroundings.

165. For its part, open tolls are usually the most suitable option—and often the only practical one—to introduce tolls in already existing roads, after being upgraded or not, that cannot be insulated since they already have several intersections. They are also suitable for short road segments, e.g., access to cities.

11.2 How are tolls to be collected? What are the side effects and implications of different toll collection mechanisms?

166. There are two basic toll collection systems: toll plazas and electronic tolls. The advantages and disadvantages of these systems are summarized in Table 17.

167. **Toll plazas.** Toll plazas are the most traditional and common type of toll collection system. They consist of a series of toll gates located one next to the other. Each gate has a

barrier that only opens once the driver pays the toll. Users may be offered the possibility to pay through various means: cash, bank cards, vouchers, or others. Collection can be done by employees, automatic machines, or a combination of both. Employees may be used in gates dedicated to special vehicles or payment in cash where change can be given.

168. **Electronic tolls.** Electronic systems allow toll payment without requiring vehicles to stop and, with the more sophisticated systems, not even slow down. Toll plazas are replaced by gantries equipped with beacons and/or cameras designed to identify every crossing vehicle. Electronic tolling systems require that vehicles carry an authorized on-board unit (OBU), also called electronic tag or transponder which is commonly attached to their windshield. Regular users need to acquire or rent an OBU and provide a bank account where toll fares will be charged. Foreign vehicles (or those from regions without electronic tolls or with non-interoperable systems) will need to buy a prepaid tag for the time they expect to circulate in the foreign country or associate a rented OBU to a credit card.

169. **Hybrid systems.** Some countries have a hybrid system where conventional toll plazas coexist with electronic tolling systems. In these cases, toll plazas have some direct lanes provided with lecture devices where vehicles carrying an authorized OBU do not need to fully stop to pay the toll.

Table 17: Advantages and Disadvantages of Toll Collection Systems

	Advantages	Disadvantages
Toll plazas	<ul style="list-style-type: none"> • The range of payment options for drivers is broader, including cash and bank cards. • They may be the most practical option in places where a substantial share of users do not have bank accounts and/or have poor banking services. • The existence of barriers and staff makes it a simple way of fighting nonpayment. • Manual tolls may provide jobs for low-skilled and local people. 	<ul style="list-style-type: none"> • Investment in infrastructure may be higher than for electronic tolls. • They involve managing an extensive workforce, often in dispersed locations, and organizing shifts to ensure a 24 hours x 365 days operation. • Vehicles need to stop, which increases travel time and may cause congestion. • Substantial land area may be required to accommodate several toll gates in roads with dense traffic (basically in open tolls). That may be a major problem in urban or densely populated areas. • Security and fraud concerns may arise from the collection, manipulation, and transportation of high volumes of cash.

continued on next page

Table 17 *continued*

	Advantages	Disadvantages
Electronic tolls	<ul style="list-style-type: none"> Investment in infrastructure will typically be lower than in toll plazas, although higher investment in information technology systems will be required. They do not cause congestion, as vehicles do not need to stop for toll payment. Operations are generally easier: less staff, revenue is channeled in just one way, no need to manipulate or transport cash. 	<ul style="list-style-type: none"> Procedures to fight nonpayment and fraud should be set up. They may be complex and costly. Need to put in place schemes to handle foreign cars. Higher resistance from users may be found for several reasons: reluctance of occasional users to buy or rent a device for just a few trips, need to open and provide a bank account, or concerns about privacy. Revenue may be lost when devices are inoperative because of breakdowns, maintenance, or vandalism. Dependency on particular information technology providers or dedicated systems.

Source: Compiled by author.

170. So, what is the best option? The general trend across the world is toward using electronic tolling as these systems are perceived as cheaper and smarter. However how tolls are collected is relevant, two-faced issue that requires taking into consideration the perspectives of both operator and users:

171. **From the perspective of the toll roads operator**, collection costs are a substantial part of the operations and they heavily impact on its profitability. Some of the factors relevant to the operator are the amount of up-front investment; staff and information technology systems; costs and risks of fraud, nonpayment, and robberies. The operator may be inclined to adopt a cost-driven approach when deciding what toll collecting system to put in place.

172. **From the perspective of users**, how tolls are collected is an inextricable part of their experience of using the toll road. Thus, it will influence their reaction regarding tolls themselves and indirectly regarding the authority that made the decision to impose them. Users may have a negative reaction if they feel the way they should pay tolls causes delays, is too complex, unfair, or simply impolite. Users will expect a customer-friendly system to be adopted.

173. Thus, it is recommended to assess carefully the advantages and drawbacks of all toll collecting options, as well as their implications and applicability in any particular case.

11.3 What are the most common technologies used in electronic tolls?

174. There are two technology approaches to electronic tolling that can be identified as tag-and-beacon systems and satellite-based systems.

175. **Tag-and-beacon systems.** These are the most tested and widespread systems. A vehicle equipped with a battery powered OBU communicates with a transponder on an overhead or roadside gantry to register its passage through the charge point. Unequipped users will typically have their number plate recorded by a camera and identified via automatic number plate recognition systems (ANPR). Nonpaying vehicles identified with the ANPR will be subjected to enforcement procedures. Tag-and-beacon only detects vehicles as they pass across beacons on gantries or roadside poles, not distance. Thus, the actual distance traveled can only be measured if applied in closed tolls highways. Tag-and-beacon systems usually use microwave technologies that are virtually 100% efficient in detecting equipped vehicles. However, cameras with ANPR have less accuracy and are affected by many factors such as light, fog, poor maintenance or rogue manipulation of plates, and may find trouble in identifying foreign cars with exotic plates. So, some manual support is needed if higher detection ratios are expected.

176. **Satellite-based systems.** They require vehicles to be equipped with a global positioning system (GPS) receiver onboard, combined with a digital map of the road, similar to a satellite navigation device. This technology may achieve true distance-traveled charging and consider factors such as place (i.e., different toll rates in different road segments) and time (i.e., toll rates set at different levels during peak and off-peak hours). The downside: GPS technology on its own is sometimes not accurate enough to discern between two adjacent roads, the cost of OBUs may be much higher, back office is more complex, and there are some concerns about privacy. GPS-based charging is used for trucks in Germany as well as in other European countries, but its use worldwide is not yet widespread.

11.4 What is the appropriate distance between gates?

177. As explained in the previous section, only roads with a limited number of gates are suitable for closed tolls. But, how many gates should the motorway have and what is the appropriate distance between them?

178. The general principle that should apply is that the motorway is designed for long distance trips and be affected as little as possible by interferences from local traffic. Also, exit and acceleration lanes at gates may be sources of congestion and are typically black spots for accidents. These reasons explain why motorways tend to have a reduced number of gates.

179. Although no universal standard exists, the typical average distance between gates is no shorter than 10 km but not longer than 30 km. However, many factors may influence the number of gates:

- The pattern of the secondary road network that may request more or fewer junctions.
- Density of population and activities. More gates will be needed if there are many points attracting or generating strong flows of traffic.
- The business approach of the operator. If the toll road operator focuses on minimizing operating costs, the operator will prefer few gates as any of these involve costs. On the contrary, if the operator prioritizes capturing as much traffic as possible, the operator will prefer having many gates as these offer the opportunity to capture additional short-haul traffic.

11.5 Should toll roads have rest and service areas?

180. Motorways not insulated from its surroundings do not require that specific rest and service areas are planned. Typically, local business along its way will provide a variety of services for users.

181. When motorways are insulated, there are two possible approaches to this question:

- Rest and service areas are not inside the motorway's perimeter but specific gates to access them are provided.
- Rest and service areas are offered inside the motorway's perimeter.

182. The pros and cons of both options are illustrated in Table 18.

Table 18: Pros and Cons of Service and Rest Areas Inside and Outside the Motorway's Perimeter

	Pros	Cons
Rest and service areas inside	<ul style="list-style-type: none"> • Suitable for closed tolls. • Generate ancillary revenue to the toll road operator. • More convenience. Drivers do not need to drive away from their route. • Enhanced security (e.g., controls against thefts easier to implement). 	<ul style="list-style-type: none"> • Limited competition and limited number of options. Usually higher prices for users. • An access to workers and deliveries to the service areas should be provided.
Rest and service areas outside	<ul style="list-style-type: none"> • They offer more opportunities for local business in areas served by the motorway. • More competition and options offered to users. 	<ul style="list-style-type: none"> • Unsuitable for closed tolls. • Services may be provided in a less organized manner and with lower standards.

Source: Compiled by author.

183. The business of service areas in closed toll motorways are correlated with distance between gates. If distance is long, this is positive for the business of service areas inside the bonded area of the motorway and they may charge higher prices. In contrast, if there are many exits at short distance, drivers will find it easier to leave the motorway for stops along their journey. This is bad for business inside the bonded area of the motorway but positive for local business in towns served by it.

11.6 What services should be offered?

184. The list of services in toll motorways, in particular when they are closed, varies from place to place, following the practices and habits in different countries and cultures. However, some of the most common services found anywhere are listed in Table 19 and classified according to their value to users.

Table 19: Services Found in Motorways Classified According to their Value to Users

Necessary Services	Fairly Valued Services	Other Services
<ul style="list-style-type: none"> • Petrol station • Public toilets • Catering area (coffee and/or tea house offering quick meals or snacks) • Telephone for emergencies • Parking and/or rest area for trucks and cars (unsecured) 	<ul style="list-style-type: none"> • Restaurant • Convenience shop • Picnic area • Children's playground • Repair workshop 	<ul style="list-style-type: none"> • Hotel • Roads and tourism information • Secured truck park • Police • Prayer room

Source: Compiled by author.

185. Ideally, the first group of services should be available every 30–50 km either inside or outside the motorway perimeter. The second group of services should be available every 50–70 km or so. And the third group should be available every 100–150 km.

186. Rest and service areas should be properly policed to avoid disorganized parking, misuse of the facilities, and robberies of vehicles. They should be lit at night to offer a perception of safe areas and facilities should be adequately cleaned and maintained. Since customers tend to pay more for the same services at motorway areas than at conventional roadside business areas, they expect higher standards as well.



Rest area in a Casablanca–Beni Mellal motorway in Morocco. This rest area provides services such as public toilets, parking, and restaurants. (photo by Ignasi Ragas)

11.7 How should toll road operators deal with users and social groups?

187. Road users should be treated as customers regardless of the approach used for the provision of infrastructure. The common attitude of many road authorities is to deal with users in a one-direction way and very rarely are they familiar with encouraging and treating feedback from users.

188. The convenience to treat users as customers is more acute when they are asked to pay. Thus, toll roads operators need to engage in a profound cultural change in their relations with users and customers and, to some extent, so should the public authorities involved also change.

189. Some recommendations for this cultural change from what is still prevalent in the roads sector are provided below:

- Produce and disseminate a charter of rights and obligations regarding the operator and users.
- Establish channels of communication between the operator and its customers.
- A complaint mechanism should be set up. The monitoring authority should ensure suggestions and complaints are answered, and that steps to correct and improve are taken.
- The operator should inform its users correctly and honestly if they are to find hindrances to or substantial reductions of the expected standards of service (e.g., congestion, circulation restricted for works, accidents, or weather conditions, etc.).
- The operator should engage actively in initiatives to ensure safe driving in its premises.
- Facilities and services at rest and service areas should be clean, safe, and offer reasonable value for money.
- Toll collecting staff should be trained to provide adequate information regarding services along the motorway, times and distances, and offer answers to other frequent asked questions.

190. Toll roads operations provide, directly or indirectly, a wide range of employment opportunities for low- and middle-skilled staff in activities such as toll collection, information and customer service, road maintenance, services in rest areas, petrol stations, etc. Thus, in designing these services, governments and operators should take into consideration schemes to spread income opportunities among local communities, with special incentives for the more vulnerable community members such as women and less favored people.

191. It is good practice that toll road contracts set guidelines in this field. Quite often also, it is toll road operators who are willing to take the lead since these socially proactive schemes help in improving community relations and social acceptance.

Want to Learn More?

General Information on Toll Roads

- Access to the World Bank's Public-Private Partnership in Infrastructure Resource Center. World Bank. Public-Private Partnership in Roads.
<http://ppp.worldbank.org/public-private-partnership/sector/transportation/roads-tolls-bridges/road-concessions>.
- Access to the World Bank's Toolkit on Public-Private Partnerships in Roads and Highways (in low- and middle-income countries): World Bank. Toolkit for Public-Private Partnerships in Roads and Highways.
<http://www.ppiaf.org/sites/ppiaf.org/files/documents/toolkits/highwaystoolkit/index.html>.
- Findings of an ADB regional technical assistance study for ADB's developing member countries. ADB. 2001. *Developing Best Practices for Promoting Private Sector Investment in Infrastructure: Roads*.
<http://www.adb.org/publications/developing-best-practices-promoting-private-sector-investment-infrastructure-roads>.
- ADB study on challenges and recommendations for financing road construction and maintenance in the PRC after fuel tax reform. ADB. 2012. *Financing Road Construction and Maintenance after the Fuel Tax Reform*.
<http://www.adb.org/publications/financing-road-construction-and-maintenance-after-fuel-tax-reform>.
- ADB report that draws on extensive review, examination, and international experience to explore some key areas that impact corporatization and privatization policy. ADB. 2009. *Toll Roads Corporatization Strategy: Toward Better Governance*.
<http://www.adb.org/publications/toll-roads-corporatization-strategy-toward-better-governance>.

General Information on Public-Private Partnerships

- European Public-Private Partnership Expertise Centre.
<http://www.eib.org/epec/g2g/>.
- US National Conference of State Legislatures. *Toolkit on Public-Private Partnerships for Transportation*.
<http://www.ncsl.org/research/transportation/public-private-partnerships-for-transportation.aspx>.
- United Nations Economic Commission for Europe. 2008. *Guidebook on Promoting Good Governance in Public-Private Partnerships*. New York and Geneva.
<https://www.unece.org/fileadmin/DAM/ceci/publications/ppp.pdf>.

Toll Roads in Selected Countries

- **Chile:** <http://www.mop.cl>
- **Colombia:** <http://www.ani.gov.co>
- **Croatia:** <http://hac.hr>
- **Czech Republic:** <http://www.motorway.cz>
- **France:** <http://www.autoroutes.fr>
- **Hungary:** <https://www.hu-go.hu>
- **India:** <http://tis.nhai.gov.in/>
- **Kazakhstan:** <http://kazautozhol.kz> (available in Kazakh and Russian languages only)
- **Malaysia:** <http://www.llm.gov.my>
- **Pakistan:** <http://nha.gov.pk>
- **Romania:** <https://www.roviniete.ro>
- **Russian Federation:** <http://www.russianhighways.ru>
- **Slovakia:** <http://www.obchvatbratislavy.sk>
- **South Africa:** <http://www.nra.co.za>
- **Tajikistan:** <http://irs.tj>
- **Turkey:** <http://www.kgm.gov.tr>
- **Ukraine:** <http://www.ukravtodor.gov.ua/>

Decision Makers' Guide to Road Tolling in CAREC Countries

Cumulative transport investments under the Central Asia Regional Economic Cooperation (CAREC) program reached \$23.4 billion in 2017 through which approximately 9,964 kilometers of expressways or national highways were built or improved. For the upkeep of road corridors, CAREC countries agreed to take measures to set up road funds and road tolling to ensure adequate maintenance funding. This guide presents fundamental concepts of road tolling; addresses concerns typically faced in the introduction of tolls; and provides useful tips for design, implementation, and operation of toll road projects. It highlights challenges decision makers may face in implementing toll road projects and extracts lessons from international experiences relevant to the circumstances of CAREC countries.

About the Central Asia Regional Economic Cooperation Program

The Central Asia Regional Economic Cooperation (CAREC) Program is a partnership of 11 member countries and development partners working together to promote development through cooperation, leading to accelerated economic growth and poverty reduction. It is guided by the overarching vision of “Good Neighbors, Good Partners, and Good Prospects.” CAREC countries include: Afghanistan, Azerbaijan, the People’s Republic of China, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan.

About the Asian Development Bank

ADB’s vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Despite the region’s many successes, it remains home to a large share of the world’s poor. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.



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