This paper outlines the role of government in infrastructure Public-Private Partnerships (PPP) in the telecommunication industry in the Democratic Republic of Congo. It also summarizes the state of Congo’s telecommunication infrastructure, the advantages of Open Access Network (OAN) as a Broadband PPP Business Model, as well as risks allocated to the implementation of the project and proposes the World Bank Group risk mitigation instruments.
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1. Introduction

Scarce infrastructure is a major constraint to growth in the Democratic Republic of Congo (DRC). The conflict in the eastern provinces - which weakened macroeconomic performance and complicated the implementation of macroeconomic policies - destroyed the already limited infrastructures including networks, hospitals and schools. Even before the conflict, the lack of basic infrastructure made it difficult to knit together the country’s disparate economic and population centers. The country’s vast geography, low population density, extensive forestlands, and crisscrossing rivers further complicate the development of infrastructure networks.¹

The economic outlook is improving. But constraints to growth are enormous in the priority sectors. Stern reforms are urgently needed both in historic incumbent enterprises and agencies. Although the implementation of these reforms is critical for alleviating growth bottlenecks, their application is complicated by severe institutional and governance capacity constraints.²

In order to support the economic growth and improve the business environment, the government stressed the potential benefit of electricity, transport, telecommunication and other infrastructure sectors for economic growth and poverty alleviation. DRC also joined the Organization for the Harmonization of Business Law in Africa (l’Organisation pour l’Harmonisation en Afrique du Droit des Affaires (OHADA)), a decision that the World Bank Group strongly supported. Furthermore, the Sino-Congolese Cooperation agreement (SCCA) also known as Resource-for-Infrastructure swap was carefully managed by the Congolese authorities. Given the important opportunity provided by the exchange of natural resources for infrastructure investment and the need for the DRC to reap the full benefit of such an exchange, there is a need for strengthening government planning in selecting investments with high growth impact and ensuring long-term funding for maintenance out of the recurrent budget.³

Aspiring to render the business environment more favorable to sustainable private sector growth, the Government of Congo needs to explore all options for mobilizing private investment, given the lack of liquidity to finance development projects. The authorities may want to explore more actively alternative institutional arrangements, including public private partnerships (PPPs), that will allow the private sector the security to contribute to building and maintaining the required infrastructure. This paper outlines the role a government can play in Public-Private Partnerships in telecommunication sector. It also summarizes the risk allocated to the implementation of the project and proposes the World Bank Group risk mitigation instruments.

¹ AICD Country Report on DRC, March 2010
² IMF PRSD progress report DRC, October 2010
³ Idem
2. Public-Private Partnership (PPP) in the telecommunication industry

Telecommunication is a traditional public sector responsibility that today is more often offered by private sector investors and operators. The scarcity of funding available in public sector, coupled with an increasing demand in the dynamic technology outputs is giving increasing advantage to private firms. Technologies such as mobile telephony have created new markets. For these reasons, telecom has represented one of the largest areas of private investment in sub-Saharan Africa in recent years. Yet the government retains certain critical responsibilities in the sector such as regulation; in some sub-sectors (e.g. broadband), the public sector may continue to have primary investment responsibility due to significant market failures that inhibit private investment. In these cases, PPP projects provide an opportunity for development of telecommunication infrastructure without placing the full burden of the ultimate financial demands on the public balance sheet. They also allow the operator to spread the cost of infrastructure over time, rather than requiring a considerable up-front capital expenditure.

Public and private sectors have a critical role to play in order to ensure that a growing percentage of the population in developing countries can access ICT and modern telecommunications means (supply transmission bandwidth, backbone). PPP offers policy makers an opportunity to improve the delivery of services and the management of facilities and helps to mobilize private capital which in turn speeds up the delivery of public infrastructure. PPP is also an important instrument to promote universal access at this time of convergence and the edge of information technologies.

Along with power and transportation infrastructures projects, telecommunication figures among the most growing areas in PPP projects in Africa. Many governments are turning to the private sector to design, build, finance, and operate such infrastructure facilities hitherto provided by the public sector, and various PPP models are used to promote the development of national backbones. Nevertheless, fitting telecommunication projects into a PPP model can be quite challenging. Experts in the area suggest that issues specific to this sector play more important role and need to be considered carefully.

3. The state of Congo's telecommunications infrastructure

3.1. Existing infrastructure
The current problems DRC is facing are the same as in the neighbor Republic of Congo. In terms of international connectivity, the Republic of Congo currently has as the only resource to use satellite to deliver its entire telecom traffic solution uneconomical and unsuitable to the high bandwidth of the
broadband Internet. The DRC has sought for several years to access a pop connection with submarine cables available in the region.

The DRC’s population and economic activity is concentrated in three distinct centers that form a triangle—Kinshasa in the southwest, Lubumbashi in the southeast, and Kisangani in the northeast. There is a marked absence of well-developed infrastructure linking these three cities, particularly with respect to road and rail. Power and ICT infrastructure is somewhat developed along the Kinshasa-Lubumbashi axis, although there is no ICT backbone to speak of and the main power transmission line is in need of major rehabilitation. The rest of the country is almost entirely devoid of power and ICT coverage, although GSM coverage has been recently expanded in the east. With respect to transport infrastructure, many regions of the DRC (notably the southeast and northeast) are better connected with external infrastructure corridors than they are with internal ones.

As a result of the political instability since the mid-1990s, the national telecommunication system is one of the least developed in the region. Rural areas, where almost 70% of the population resides, are virtually devoid of telephone or Internet service. Fixed telephony segment, though almost nonexistent, is represented by three operators: the historic OCPT, SOGETEL and Standard Telecom, altogether reaching 37,320 people or a penetration rate of 0.06%. The national operator, OCPT theoretically has a monopoly on the sector under 1970 legislation, but it has been unable to provide a modern telecom network and unsuccessful in finding major investors for privatization. Recognizing the need for telecommunications infrastructure, the government is only loosely regulating the sector.

In the absence of national and international transmission network provided by OCPT and / or RENATELSAT, all important operators have established their own national transmission infrastructure, mostly in the form of links satellite. The lack of access to a submarine cable has pushed all operators to set up their own infrastructure with satellite links or international access.

Despite the low level of GDP per capita, the mobile market has experienced a tremendous growth since 2003, moving from a penetration rate of 2.2% to nearly 14% in late 2008, with a number of active customers estimated at nearly 9.2 million.

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9 Budde Report on DRC: Telecoms, Mobile & Broadband
Mobile networks have taken over as the providers of basic telecom services. However, the proliferation of networks has also caused interference and compatibility problems, and there is limited available spectrum due to poor spectrum management. As a result, the mobile sector has consolidated and now has four major players: Vodacom Congo, Zain DRC, Millicom (Tigo) and Congo Chine Telecom (CCT) in which OCPT holds 49%. The vast majority of subscribers are on prepaid plans.\(^\text{10}\)

Table 1: Market shares of leading telecommunications operators in DRC

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vodacom</td>
<td>45.6%</td>
<td>51.8%</td>
<td>51.3%</td>
<td>52.8%</td>
<td>50.3%</td>
<td>43.7%</td>
</tr>
<tr>
<td>Celtel</td>
<td>49.2%</td>
<td>42.7%</td>
<td>42.9%</td>
<td>41.5%</td>
<td>35.1%</td>
<td>35.4%</td>
</tr>
<tr>
<td>Tigo</td>
<td>3.1%</td>
<td>3.3%</td>
<td>2.2%</td>
<td>1.1%</td>
<td>8.4%</td>
<td>14.2%</td>
</tr>
<tr>
<td>CCT</td>
<td>2.0%</td>
<td>2.2%</td>
<td>3.6%</td>
<td>4.5%</td>
<td>6.2%</td>
<td>6.7%</td>
</tr>
</tbody>
</table>

Source: ARPTC

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\(^{10}\) See Budde Report on DRC
Similar to the Republic of Congo, the telecommunication infrastructure’s expansion tend to follow the country’s urbanization pattern. For this reason, the development of the Internet market has been held back. In 2008, there were about 290,000 Internet users. The residential market is estimated at about 100,000 subscribers. The mobile operators are beginning to play a significant role in this sector as well, following the launch of mobile data services. 3G mobile services are not yet available in Kinshasa and broadband services are very limited.

Figure 2 Internet Users, 1998-2008

Source: Bezzina et al. Data from BuddeComm based on ITU and Global Mobile data
3.2. **Broadband Infrastructure program in DRC**

The Democratic Republic of Congo is facing the same problems as its neighbor the Republic of Congo. Both countries have sought with no success for several years to access a pop connection with submarine cables available in the region.

Originally planned to be completed in 2011, ACE (Africa Coast to Europe), will probably be operational in the first half of 2012 due to delays induced by the financial package. The landing party of ACE in the DRC is the incumbent, the Congolese Office Congolais des Postes et Télécommunications (OCPT), while the operator Vodacom is supposed to be a part of the WACS (West Africa System Cable) project.

### 3.2.1. The Axis Muanda - Kinshasa

The DRC has the great opportunity to connect to two submarine cables available in Muanda. This comparative advantage can allow the competition to play its full role and to ensure reasonable capacity price, and, on the other hand, it can enhance the robustness of international connectivity in case of failure of one of the submarine cables.

The axis Muanda - Kinshasa is the first phase of the Nationwide Broadband which aims to cover the entire territory along the main roads. This connection made by China International Telecommunication Construction Corporation (CITCC) for OCPT has been delivered. This is composed of an optical fiber of
576 km as following: Muanda - Boma (94 km), Boma - Matadi (120 km), Matadi - Kimpese (141 km), Kimpese - Mbanza (63 km) and Mbanza - Kinshasa (158 km). At this stage, the OCPT does not have available human and technical capacity to manage and maintain such a network.

3.2.2. Axis Kinshasa - Kisangani

The cost of broadband infrastructure capable of covering the DRC economic triangle Kinshasa – Lubumbashi – Kisangani would require significant funding. That is why is seems wise to connect Lubumbashi to Zambia, although landlocked, it is interconnected with the South African submarine cables. Following the same logic, Bukavu and Goma should be able to interconnect cables Submarine System (EASSy and SEACOM) via Rwanda and Burundi. Kisangani’s geographical situation makes it more difficult to connect to Bangui or Bukavu due to distance and crisscrossing environment.

3.2.3. The Southern Africa Power Pool (SAPMP) (Kinshasa – Zambia)

As a part of a project to restore the national power company (SNEL) network and its connection to the Southern Africa Power Pool (SAPMP project), a 48-optic-fiber cable is planned to be placed on high voltage transmission lines of Inga connecting electricity to Zambia. This network involves all the major cities of this axis: Kinshasa, Kikwit, Kananga, Kamina, Kolwezi, Lubumbashi. The Government of Congo intends to directly or indirectly market the excess capacity to local operators. This telecommunication component, up to U.S. $ 47 million financed by the World Bank, should help build a broadband infrastructure available to operators, broadcasters, ISPs, enterprises, government and other parties interested, but the manner of exploitation of the fiber and marketing capabilities have yet to be clarified. Currently, SNEL has only a permit of the independent system for its own needs. The SAPMP project provides that excess capacity will be operated and marketed under a PPP.
repeaters. The SNEL’s high-voltage network facilities currently cover only the portion Inga / Lubumbashi. New facilities must be built in order to connect to Zambia. The SAPMP’s main objective is to rehabilitate and strengthen the current SNEL’s 2300 km high and very high voltage from the Inga hydroelectric to Kasumbalesa at the Zambia border. The earth wire will consist of 24 pairs of optical fibers and will be divided into two parts: one devoted to specific telecommunications needs, SNEL and SAPP (South Africa Power Pool) internal operation of electrical facilities and another part will be excess capacity which will be available for the market using a PPP and applying an Open Access model.

3.2.4. Metropolitan Network loop, Kinshasa

Aimed to enable the OCPT once again to become a market player in the fixed line business, the 260 million USD’s agreement with the Chinese Huawei represented so far the largest of its kind. It was agreed that Huawei will install (i) a, optical fiber loop of 21 km with a capacity of 10 Gbps, covering the capital Kinshasa, (ii) a CDMA network service for subscribers in Kinshasa, and (iii) a standard earth station B. The loop was planned to be open to mobile operators. The first phase was expected to connect 150,000 subscribers through the CDMA network, 15,000 Internet subscribers and 10,000 broadband subscribers through ADSL connections.

The second phase was to be financed by EximBank and was scheduled for an amount of 60 million USD. It was expected to increase capacity of 300,000 additional subscribers for the voice service in Kinshasa, develop new services in Mbuji Mayi, Matadi, Lubumbashi, Goma, Bukavu and Kisangani.

3.2.5. Interconnection Kinshasa - Brazzaville

China International Telecommunication Construction Corporation (CITCC) conducted a technical Survey of feasibility for the interconnection. The survey involved several expertises from the national operators of DRC (OCPT) and Congo (Congo Telecom). In September 2009, the two countries showed the intention to interconnect the two capital cities by a submarine optic fiber. This initiative is currently under review for the government of DRC and need a strong follow up in the terms and conditions for infrastructure management and cost sharing.

3.2.6. The ECCAS broadband infrastructure development in Central Africa (PDILB-AC)

In a recent publication, the Economic Community of Central African States (ECCAS) aimed to develop a broadband infrastructure program in Central Africa (PDILB-AC) with the purpose to deploy a transmission cable of nearly 28,500 km of optic fiber composed of at least 12 optical fibers each.
4. Challenges in the telecommunication sector in the Democratic Republic of Congo\textsuperscript{11}

Despite difficult economic conditions, the DRC has reached a relatively high level of GSM signal coverage at prices comparable to those elsewhere. Completing the expansion of GSM network coverage is particularly challenging because of the spatial characteristics of the country. Analysis suggests that up to 80 percent of the population could be reached on a commercially viable basis, but the remaining 20 percent are dispersed across remote areas that cannot be covered without some degree of public subsidy. This “coverage gap” is among the largest found for any country in Africa (figure 3).

\textbf{Figure 3: Relatively good progress in expanding GSM coverage}

Source: DRC Country Report, AICD

\textsuperscript{11} This section heavily draws from “DRC Country Profile, AICD”, March 2010
The DRC lags far behind in Internet usage, and would benefit from access to submarine cables. Internet penetration is extremely low in the DRC (even by African standards), and available bandwidth is a fraction of what is found elsewhere in Africa. This is partly explained by the very high cost of Internet access—$74 per month, which is typical for a country lacking access to submarine cables. This situation is unlikely to improve significantly until the country develops links to the submarine cables along the West African coast. As the experience of other countries has shown, once such links are made, it is essential that this infrastructure be competitively provided; otherwise, consumers will not benefit from lower prices (table 8).

Figure 4: High international call charges, driven by technology and market power

<table>
<thead>
<tr>
<th>$</th>
<th>% cases</th>
<th>Call within Sub-Saharan Africa</th>
<th>Call to the United States</th>
<th>Internet dial-up</th>
<th>Internet ADSL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without submarine cable</td>
<td>67</td>
<td>1.34</td>
<td>0.86</td>
<td>68</td>
<td>283</td>
</tr>
<tr>
<td>With submarine cable</td>
<td>33</td>
<td>0.57</td>
<td>0.48</td>
<td>47</td>
<td>111</td>
</tr>
<tr>
<td>Monopoly on international gateway</td>
<td>16</td>
<td>0.70</td>
<td>0.72</td>
<td>37</td>
<td>120</td>
</tr>
<tr>
<td>Competitive international gateway</td>
<td>16</td>
<td>0.48</td>
<td>0.23</td>
<td>37</td>
<td>98</td>
</tr>
</tbody>
</table>

Note: ADSL = asymmetric digital subscriber line.

Source: DRC Country Report, AICD
5. Capital investment needs in the broadband sub-sector

All the facilities mentioned above, only the axis-Kinshasa Lubumbashi needs to be built or completed. All other infrastructures are about to be realized (Matadi-Kinshasa-Brazzaville and Noqui) or will be funded by third party operators (Bukavu-Rwanda).

Table 2: Budgetary valuation of international networks

<table>
<thead>
<tr>
<th>Axis</th>
<th>Characteristics</th>
<th>Equipment</th>
<th>Estimated cost*12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axis Bukavu - Rwanda</td>
<td>2 kilometers</td>
<td>2 terminal and 2 SDH</td>
<td>US $ 900,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Supply and installation of cable</td>
<td>US $ 200,000</td>
</tr>
<tr>
<td>Axis matadi - Noqui</td>
<td>40 kilometers</td>
<td>2 terminal and 2 SDH</td>
<td>US $ 900,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>US $ 300,000</td>
</tr>
<tr>
<td>Axis Kinshasa - Brazzaville - Wired Solution</td>
<td></td>
<td>Terminals and SDH + installation</td>
<td>US $ 1,700,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Supply and installation of cable</td>
<td>US $ 800,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Terminals and SDH + installation</td>
<td>US $ 1,700,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>supply and construction of towers</td>
<td>US $ 300,000</td>
</tr>
<tr>
<td>Axis Kinshasa – Kasumbalesa (OCPT)</td>
<td>2433 kilometers</td>
<td>20 Terminals 10 Gbit / s WDM fiber bus 44 Terminals 10 Gbit / s WDM fiber direct 22 SDHs 40 energy containers and power</td>
<td>US $ 50,000,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Supply and installation of transmission equipment</td>
<td></td>
</tr>
<tr>
<td>Axis Kinshasa and Lubumbashi (Project SAPMP)</td>
<td></td>
<td>Terminal 10 Gbit/s WDM fiber bus, terminal 10 Gbit/s fiber direct and SDH between Kinshasa and Lubumbashi</td>
<td>US $ 39,000,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Terminal 10 Gbit/s WDM back-to-back bus, terminal 10 Gbit/s back-to-back direct and SDH in Kolwezi</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Extensions in Tshikapa, Kamina, Likasi and Busanga. A Segment between Mwene Ditu - Mbuji Mayi and a 3-hops liaison in Kolwezi, Nguba, Likasi</td>
<td></td>
</tr>
</tbody>
</table>

Source: Author

---

12 *Estimated cost for provision and installation
AICD developed the spending needs models uniformly for each African country. The specific diagnostic on DRC suggests the need for DRC to implement an ambitious infrastructure investment agenda. In order to meet its most pressing infrastructure needs and to catch up with developing countries in other parts of the world, the DRC needs to expand its infrastructure assets in a number of key areas (ICT, Power, Transport, Water and Sanitation) as outlined in the illustrative figure 5.

The report stipulate that meeting these illustrative infrastructure targets for the DRC would cost close to $5.2 billion per year for the next decade, including over $1 billion for maintenance. Capital expenditure would account for 80 percent of this overall requirement. The power, transport, and water supply and sanitation (WSS) sectors would each demand sustained spending of $1.5 billion per year; needs for the ICT sector are substantially lower (Figure 6). What is particularly striking is that, going forward; the DRC needs to allocate over $1 billion a year to preventive maintenance of its network infrastructures in order to ensure their long-term sustainability.

Figure 6: Indicative infrastructure spending needs in the DRC, 2006–15

<table>
<thead>
<tr>
<th>Sector</th>
<th>$ million per year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CAPEX</td>
<td>O&amp;M</td>
</tr>
<tr>
<td>ICT</td>
<td>246</td>
<td>242</td>
</tr>
<tr>
<td>Power (trade)</td>
<td>1,424</td>
<td>49</td>
</tr>
<tr>
<td>Transport (basic)</td>
<td>1,062</td>
<td>391</td>
</tr>
<tr>
<td>WSS</td>
<td>1,278</td>
<td>431</td>
</tr>
<tr>
<td>Total</td>
<td>4,045</td>
<td>1,112</td>
</tr>
</tbody>
</table>

Source: Africa Infrastructure Country Diagnostic; Briceño-Garmendia and others 2008. [Both sources correct?]
Note: Figures refer to investments (except those in the public sector) that also include recurrent spending. Public sector covers general government and nonfinancial enterprises.
O&M = operations and maintenance; CAPEX = capital expenditure.
5. Public-Private Partnerships in telecommunication sector in Congo

5.1. PPPs instruments
Numerous forms of PPPs have been developed worldwide to respond to the various fields of application. The Public-Private Infrastructure Advisory Facility (PPIAF) has presented the major categories of PPP in a simplified way in the figure below, in which the extent of private sector participation increases from left to right.

Figure 7: The major categories of PPP

Among many different forms of Public Private Partnerships (PPPs), the most common ones discussed in this paper are management contracts, operation and maintenance concessions (service concessions), and Build/Operate/transfer BOT-type of concessions (works concessions).

Management contracts: A management contract is an arrangement by which a private company is entrusted with various types of tasks usually performed by the public authority, relating to the organization of road maintenance operations. Usually, the function of the private firm is to respond to day-to-day routine maintenance requirements by contracting private companies, on behalf of the public entity, to perform the works. Management contracts can also (or only) focus on operation management. In this case, typical tasks entrusted to the private sector are: traffic counting, axle-load weighing and providing traffic information, traffic management including surveillance, stand-by services for accidents, traffic regulation, toll collection (usually not remunerated on the basis of the amounts collected but rather on a fixed rate basis).

Operation and maintenance concessions (service concessions): The host country's objectives may be for the private sector to operate and maintain an already existing road, and therefore the government may grant a concession to the private participants to charge user tolls to help finance the improved operation and maintenance of the road. Such a concession shifts the

financial burden of operation and maintenance to the road user and at the same time should increase the efficiency of the road's operation and maintenance. Besides the issues inherent in a concession agreement, an operation and maintenance concession is similar in scope and approach to what is required and negotiated in a typical operation and maintenance agreement between private parties under a BOT-type arrangement (see below). This type of concession is also referred to as franchise, lease; "affermage" (French term) or "concession" under the PPI database.

Operation and maintenance concessions enable the public sector in developing countries to transfer commercial risk to the private sector and to create incentives for the private sector to ensure efficient revenue collection and to undertake regular maintenance to increase the reliability of facilities and postpone their renewal.

**BOT-type of concessions (works concessions):** Under a BOT, the responsibility of the concessionaire is not limited to operation and maintenance of the infrastructure but also comprises an initial construction, upgrading or major road rehabilitation component. Massive investment and consequent mobilization of private funding sources is therefore required from this company and is to be repaid from the revenue collected from road users (usually tolls). BOT (Build Operate Transfer) stresses the responsibility of the private entity during construction and operation of the road and the handing over (transfer) of the assets to the public entity at the end of the operation period. The high initial investment required from the private sector and the consequent long concession period make the distribution of risk between the parties a key element of success in such schemes. Many variations on this type of contract have been implemented with a consequently growing number of acronyms used to label them (DBFO, BOOT, BTO), refer to the Glossary. This PPP type is also referred to as "greenfield" in the PPI database.

BOT-type of concessions offer further advantages of increased value for money through efficiencies in construction costs as well as plant and labor management and to escape public budget constraints and to mobilize investment funds rapidly through project finance non-recourse funding. However, tendering and contracting may initially be lengthy procedures if there is little previous experience in the country.

In the BOT-type concession, private sector participants typically establish a project company and, after securing an exclusive license from the host government or contracting authority (concession agreement), construct, control, operate and maintain a project for a determined
length of time (concession period). The private sector participants then transfer the project company assets back to the host government after the period has elapsed.\textsuperscript{15}

5.2. Open Access Network (OAN) as a Broadband PPP Business Model

Open access model provides broadband-access customers with fair access to service, provided by different – and usually competing – service providers (SPs). The strength of OAN is that many services providers share the same infrastructure, networks resources and equipments of a single network provider. This causes a tremendous change in costs, revenue potential as well as in income potential of the network. On the customer side, the open access gives a free choice of service providers, to individual service providers it guarantees equal terms for offering their services (internet, voice, video, and others) to customers.\textsuperscript{16}

The open access model represents a very different approach compare to the traditional one. The fact that the single network is shared among many different service providers reduces costs of services for service providers as well as to customers. For customers, open access present a golden opportunity for freedom of choice with regard to choice they are willing to take.

Open access model is a perfect choice for broadband PPP infrastructure, not only because it put customer needs at the spotlight, but also it can be an important tool for economic development as it promotes universal access of technology to the entire population no matter the geographical origin, includes citizen into the active participation of their community development.

6. Risk allocated to the implementation of the project

There are various risks that the project company may not be able to manage. Mostly those risks are political risks such as events related to war, rebellion, default or failure of public sector entities, change in law and delays by authorities, or other contentious issue. There is a risk related to public perception, this happens when the grantor is a political entity. The public may not understand that the grantor is removed from the day-to-day operations of the public service which is the subject of the project company may be imputed to the grantor. Figure 5 shows the risks shared by project participants in a hypothetical BOT-type PPP, assuming the project company, therefore the lenders, will bear a portion of each of these risks.\textsuperscript{15}

\textsuperscript{15} See PPIF Toolkit
\textsuperscript{16} See Bogataj (2009)
Environmental risks have become far more central consideration over recent years. Developing countries are now pushed to follow suit applied by their counterparts in the industrialized countries. Social risk has a very important impact but infrastructure projects do not pay much attention on such issues. Reactions and interaction between the project and the society is important. Social aspects of investments service make PPP more vulnerable to social risks. But managing social risks in a proper way can provide a positive benefit for the project.

In telecommunication PPP projects, issues such as property right are mostly related to such projects when fiber optic cables must be laid on land. Terrestrial optic fiber projects involve digging land and install cables. Sometimes this operation can be difficult if local authorities are not involved in the facilitation of this operation. Property owners can also be very demanding once cables pass they land. Hence, they are able to hold an ongoing project and require important payment before accessing the land. Even if access to land is obtained, the question of whether or not to maintain property right in the optic fiber cable once installed must be considered. When the site is selected, a major part of the risk that should be addresses is relating to rights of way and the access to land. Optic fiber networks are less employee-intensive when we compare to other projects such as construction of roads, airports or other similar infrastructures but involve a lot of operations and maintenance.

\[17\] See Delmon (2009)
Figure 8: Risk Sharing\textsuperscript{18}

<table>
<thead>
<tr>
<th></th>
<th>Political</th>
<th>Cost increase</th>
<th>Environmental</th>
<th>Market</th>
<th>Development</th>
<th>Operation</th>
<th>Performance</th>
<th>Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Company</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Grantor</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Contractor</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Operator</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Offtake Purchaser</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Input Supplier</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Source: Delmon (2009)

\textsuperscript{18} Also known as “risk matrix”, project participants will use far more complex and sophisticated versions of this matrix to chart risk allocation and establish project strategy (see Delmon (2009). Annex 1 provide a more exhaustive and exclusive risk matrix.
The government’s role in any specific PPP will depend upon the type of contract and other project-specific factors. But regardless of what form of PPP is employed; the government will have a critical role. Certain responsibilities will remain in the public sector, while in some cases the government may have to retain risks that cannot be borne by the private sector. In general, the main areas of public sector responsibility in a PPP are:

- **Regulation** – the government remains responsible for overall oversight of the sector. With regard to any given PPP, the government must continue to comply with aspects of the regulatory regime that are committed to the developer, or otherwise necessary to make the project feasible. These may include tariff-setting mechanisms, competition policy, safety standards etc.

- **Force Majeure** – in all PPPs, the government will retain responsibility for risks that are beyond the control of the private sector. These include natural disasters, acts of war, and actions of the government itself (e.g., expropriation or breach of regulatory responsibility). In many cases, the government can obtain third-party guarantees to backstop its obligations in this regard (see section 7.a).

- **Social and Environmental** – the government must strictly comply with all social and environmental commitments made at the time of project development and construction throughout the life of the project. This is an absolute prerequisite for building up a long-term partnership with the local population and NGOs, which is the basis for a sustainable positive climate around the project as well as for making sure that financing from multilateral / bilateral institutions can be accessed.

- **Financing** – Ideally, the private sector will be responsible for all financing and financing-related risks in a PPP. However, in many cases the government may need to participate in the financing or provide guarantees to ensure their participation.

Government intervention in the operations of the project is needed to safeguard the national interest and well-being of the population it represents. Incremental development of construction and use and health and safety regulations, particularly in case where technology involved is still rapidly evolving, may pose considerable problems for developers if the regulations are not initially sufficiently well developed for the proposed service provided to accurately factor the relevant risks into his overall development equation. The government’s role is also representing its citizen by overseeing the operations of the facility, and also protecting of the environment and the interest of minority groups in the society. National security is an obvious primary concern of all governments and the maintenance of key public services in the event of conflict must form an essential plank in the government defense strategy. But this need for national security may be at odd with the philosophy of infrastructure
privatization, particularly when the company that provides services is owned or controlled by overseas interests. Furthermore, government’s role is to coordinate and mobilize resources of the society it represent in order to avoid social chaos. In addition, it must facilitate the accomplishment of tasks for the people of the society as a whole which individual alone cannot accomplish.

7. The World Bank Group risk mitigation instruments

The World Bank Group, particularly the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA) provide a set of guarantee products for PPPs. These products are partial risk guarantees (PRGs) and Multilateral Investment Guarantee Agency (MIGA) Political Risk Insurance (PRI). Given its experience in developing countries, the World Bank covers government performance risks that the market is not able to absorb or mitigate. The guarantee mobilizes new sources of financing at reduced financing costs and extended maturities, thereby enabling commercial/private lenders to invest and support PPP projects in developing countries. Guarantees can mitigate a variety of critical sovereign risks and effectively attract long-term commercial financing in sectors such as power, water, transport, telecom, oil and gas, and mining. Guarantees can enhance private sector interest in participating in privatizations and public private partnerships. It can also help sovereign governments access the financial market.

Investors want to be protected from any type of risks. These risks can be political such as convertibility, devaluation, expropriation, and violence, regulatory or legal. Risks can also be market risks related to foreign exchange, commodity price, interest rate change, demand or access to finance or default risks. There are also risks related to breach or repudiation of contracts. Although related to political decisions, such risks can result from a number of influence, and often by neglect or lack of resource. Because of the ambiguous nature of those risks, governments need to protect investors’ risks in order to attract more private capital, at a lower cost. The bank’s instruments will allow investors to be protected against uncertainties.

**IBRD PRG and MIGA PRI products**

a. **IBRD/IDA Partial Risk Guarantees (PRGs)** are typically termed Political Risk Guarantees or Insurance or Political Risk Insurance (PRI) depending on the provider, cover private lenders against the risk of a government-owned entity failing to perform its obligations with respect

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19 See Smith A. J. (1999)
20 You can read more on the World Bank guarantee products on the www.worldbank.org/guarantees
to a private project. PRGs have been usefully deployed in markets where available commercial financing is scarce, often substantially increasing maturities and reducing bank margins. PRGs can cover a range of risks relating to government performance including:
- changes in law
- failure to meet contractual payment obligations
- obstruction of an arbitration proceeding
- expropriation and nationalization
- foreign currency availability and convertibility
- nonpayment of a termination amount or an arbitration award following a covered default
- failure to issue licenses, approvals, and consents in a timely manner
- failure to follow published regulatory methodology

Bank guarantees are intended to be catalytic instruments and therefore are offered as partial guarantees only. Eligible investments include commercial bank loans, bank letters of credit, “deemed loans” (contingent obligations which become payable upon specific actions), and other forms of debt financing. The risks are shared between the private lender, the private project sponsor (in a PRG), the government, and the Bank.

IBRD/IDA PRGs are available for all countries eligible for IBRD/IDA credits. The World Bank also offers enclave guarantees, which are partial risk guarantees structured for export oriented commercial projects generating foreign exchange in IDA-only countries (including “red light” countries that receive only IDA grants). The amount of Bank country allocation required by a PRG is a determined largely by the country’s WB status. For IDA countries, PRGs are generally charged 25% of the face amount of the guarantee. For IBRD countries, PRGs are charged the present value of the Bank’s exposure, which for a straightforward guaranteed bank loan would be 100% of the face amount.

b. MIGA Political Risk Insurance (PRI) is a tool for businesses to mitigate and manage risks arising from the adverse actions - or inactions - of governments. As a risk mitigation tool, PRI helps provide a more stable environment for investments into developing countries, and to unlock better access to finance. MIGA’s PRI product insures eligible projects against losses relating to:
- Currency transfer restrictions
- Expropriation
- War and civil disturbance
- Breach of contract

Eligible projects include new cross-border investments originating in any MIGA member country, destined for any developing member country; investments must be for greenfield projects, expansion/modernization/financial restructuring of existing projects, or privatization

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of state-owned enterprises. In most cases, the investors cannot be nationals of the country where the investment is being made. Eligible investments include equity, shareholder loans, and shareholder loan guaranties (minimum maturity three years). Loans to unrelated borrowers can be insured, provided a shareholder investment in the project is insured concurrently or has already been insured. Other forms of investment, such as technical assistance and management contracts, and franchising and licensing agreements, may also be eligible.

**Figure 9: Guaranteed Debt structure**

These instruments can cover a range of sovereign or parastatal risks, subject to specific obligations contractually agreed to by the government for a specific project. The types of risks covered may vary, including:

- currency inconvertibility/nontransferability: losses arising from the inability to convert local currency into foreign exchange, or to transfer funds outside the host country;
- political force majeure risks such as expropriation: losses as a result of actions taken by the host government that may reduce or eliminate ownership of, control over, or rights to the insured investment;
- war and civil disturbance; material adverse government action: losses from damage to, or the destruction or disappearance of, tangible assets caused by politically motivated acts of war or civil disturbance in the host country;
- government (or government entity) contractual payment obligations (e.g., periodic or termination payments; agreed subsidy payments; minimum revenue guarantees);
- regulatory risk; change of law and regulations; negation or cancellation of license and approval; non-allowance for agreed tariff adjustment formula or regime;
- contractual performance of public counterparties (e.g., state-owned entities under an off-take agreement, an input supply agreement);
- frustration of arbitration; and
- certain uninsurable force majeure events.

Unlike IBRD / IDA PRGs, IBRD Enclave PRGs will not cover the performance and payment obligations of the output purchaser or foreign exchange convertibility/transferability.
Works Cited


## Annex 1. Sample Risk Matrix

<table>
<thead>
<tr>
<th>Risk</th>
<th>Description</th>
<th>Possible Mitigation</th>
<th>Possible Allocation</th>
</tr>
</thead>
</table>
| Availability risk | The possibility that the services to be provided by the private party do not meet the output specifications of the Relevant Government Institution. | Clear output specifications.  
Performance monitoring.  
Penalty Deductions against service payments or subsidies. | Private Party.                                                               |
| Completion risk  | The possibility that the completion of the project facilities may be delayed so that the delivery of the services cannot commence at the scheduled date. | Special insurance (project delay insurance).  
Liquidated damages, construction bonds and other appropriate security from the Private Party to achieve completion, unless caused by the Relevant Government Institution. | Private Party, unless delay caused by Relevant Government Institution |
| Cost over-run risk | The possibility that during the design and construction phase, the actual costs will exceed tendered costs. | Fixed price construction contracts.  
Contingency provisions.  
Standby debt facilities / additional equity commitments | Private Party.                                                               |
<table>
<thead>
<tr>
<th>Risk</th>
<th>Description</th>
<th>Possible Mitigation</th>
<th>Possible Allocation</th>
</tr>
</thead>
</table>
| Design risk  | The possibility that the private party’s design may not achieve the required output specifications. | Clear output specifications by Relevant Government Institution.  
Design warranty by private party.  
Patent and latent defect liability.  
Approval by Relevant Government Institution (but review must not lead to input specifications by Relevant Government Institution).  
Independent Expert appointment to resolve disputes on expedited basis. | Private Party.               |
| Environmental risk | The possibility of liability for losses caused by environmental damage arising from construction or operating activities, or from activities not attributable to the activities of the private party. | Thorough due diligence by the bidders of the project site conditions.  
Independent surveys of the project site commissioned by the Relevant Government Institution at its cost.  
Works to remedy identified pre-transfer environmental contamination. | The Private Party unless not caused by them then the Relevant Government Institution, but Relevant Government Institution’s liability should be capped |
<table>
<thead>
<tr>
<th>Risk</th>
<th>Description</th>
<th>Possible Mitigation</th>
<th>Possible Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange rate risk</td>
<td>The possibility that exchange rate fluctuations will impact on the envisaged costs of imported inputs required for the construction or operations phase of the project.</td>
<td>Hedging instruments (e.g. swaps).</td>
<td>Private Party unless deemed not to be value for money in which case the Relevant Government Institution</td>
</tr>
<tr>
<td>Force Majeure risk</td>
<td>The possibility of the occurrence of certain unexpected events that are beyond the control of the parties.</td>
<td>Define “Force Majeure” narrowly to exclude risks that can be insured against and that are dealt with more adequately by other mechanisms.</td>
<td>Shared</td>
</tr>
<tr>
<td>Inflation risk</td>
<td>The possibility that the actual inflation rate will exceed the projected inflation rate. This risk is more apparent during the operations phase of the project.</td>
<td>Index-linked adjustment to service payments or user charges.</td>
<td>Shared.</td>
</tr>
<tr>
<td>Risk</td>
<td>Description</td>
<td>Possible Mitigation</td>
<td>Possible Allocation</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Insolvency risk</td>
<td>The possibility of the insolvency of the private party.</td>
<td>SPV structure to ring-fence the Project cash flows. Security over necessary Project Assets by Relevant Government Institution. Limitations on debt and funding commitments of the private party. Reporting obligations in respect of financial information and any litigation or disputes with creditors. Relevant Government Institution has right to terminate the PPP Agreement. Substitution of private party in terms of the direct agreement with Lenders.</td>
<td>Private Party.</td>
</tr>
<tr>
<td>Insurance risk</td>
<td>The possibility that any risks that are insurable become uninsurable or of substantial increases in the rates at which insurance premiums are calculated.</td>
<td>Self-insurance by the Relevant Government Institution</td>
<td>Shared</td>
</tr>
<tr>
<td>Interest rate risk</td>
<td>These are factors affecting the availability and cost of funds.</td>
<td>Hedging instruments (e.g. swaps). Fixed rate loans</td>
<td>Private Party.</td>
</tr>
<tr>
<td>Risk</td>
<td>Description</td>
<td>Possible Mitigation</td>
<td>Possible Allocation</td>
</tr>
<tr>
<td>-----------------------------</td>
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<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Latent defect risk</td>
<td>The possibility of loss or damage arising from latent defects in the object included in the Project Assets (compare, the treatment of latent pre-transfer environmental contamination, see environmental risk).</td>
<td>Wherever possible, the design and construction of the Facilities must be performed or pDRCured by the private party.</td>
<td>If the Private Party designs and constructs, then Private Party risk.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The bidders must undertake a thorough due diligence of facilities to uncover defects.</td>
<td>If not, then Relevant Government Institution.</td>
</tr>
<tr>
<td>Maintenance risk</td>
<td>The possibility that the cost of maintaining assets in the required condition may vary from the projected maintenance costs, or maintenance is not carried out.</td>
<td>Clear output specifications.</td>
<td>Private Party.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Penalty regime and performance monitoring.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Special insurance and special security in the form of final maintenance bonds.</td>
<td></td>
</tr>
<tr>
<td>Market, demand or volume risk</td>
<td>The possibility that the demand for the services generated by a project may be less than projected</td>
<td></td>
<td>For a user-fee project, the Private Party or shared if there is a revenue guarantee from the Relevant Government Institution</td>
</tr>
<tr>
<td>Risk</td>
<td>Description</td>
<td>Possible Mitigation</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Operating risk</td>
<td>Any factors (other than Force Majeure) impacting on the operating requirements of the Project.</td>
<td>Clear output specifications. Penalty regime and performance monitoring. Special insurance.</td>
<td></td>
</tr>
<tr>
<td>Planning risk</td>
<td>The possibility that the proposed use of the project site in terms of the PPP Agreement and, in particular, the construction of the Facilities on the project site will fail to comply with any applicable laws.</td>
<td>The Relevant Government Institution must identify at the feasibility phase any macro-level planning consents such as, any land-use and zoning Consents. These Consents must be obtained before the project is put to tender. The Private Party must identify all planning consents that are required for the project having regard to its design and construction proposal. It must make adequate provision in its programme for such consents to be obtained.</td>
<td>In relation to any land-use and zoning consent, the Relevant Government Institution, unless project site selection is the private party’s responsibility. In relation to any building consent or other design or construction specific planning consent, the private Party</td>
</tr>
<tr>
<td>Risk</td>
<td>Description</td>
<td>Possible Mitigation</td>
<td>Possible Allocation</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Political risk</td>
<td>The possibility of unforeseeable conduct by the Relevant Government Institution that materially and adversely affects the private party.</td>
<td>Limit risk to those circumstances where there is no other relief in the PPP Agreement and to expropriating actions.</td>
<td>In relation to discriminatory conduct and expropriating actions, the Relevant Government Institution.</td>
</tr>
<tr>
<td>Regulatory risk</td>
<td>The possibility that consents required from other government authorities will not be obtained or, if obtained, can only be implemented at a greater cost than originally projected</td>
<td>During the feasibility phase of the project, a legal scan is undertaken by the Relevant Government Institution to identify all such consents, licenses and permits. Implementation by the Relevant Government Institution of a liaison pDRCess with the responsible government authorities before the tender documents are issued. Due Diligence by private party to identify the consents required for its operating requirements.</td>
<td>If any such Consents can be obtained before the PPP Agreement is signed, the Relevant Government Institution.</td>
</tr>
</tbody>
</table>

In relation to the Private Party’s operating requirements, the Private Party.
<table>
<thead>
<tr>
<th>Risk</th>
<th>Description</th>
<th>Possible Mitigation</th>
<th>Possible Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residual value risk</td>
<td>The risk that the project assets at termination or expiry of the PPP Agreement will not be in the prescribed condition for transfer to the Relevant Government Institution.</td>
<td>Obligations on private party to maintain and repair.</td>
<td>Private Party.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Audit of project assets towards the end of project term.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Security by the private party in favor of the Relevant Government Institution, e.g. final maintenance bond or deduction from service payment.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reinstatement obligations on Private Party.</td>
<td></td>
</tr>
<tr>
<td>Resource or input risk</td>
<td>The possibility of a failure or shortage in the supply of the inputs or resources (for example, oil or other fuels) required for the operation of a project including deficiencies in the quality of available supplies.</td>
<td>Supply contracts for supply of total project requirements, such as take and pay contracts.</td>
<td>Private Party, unless the inputs are supplied by the Relevant Government Institution.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Relief Events but only if failure or shortage not attributable to the Private Party.</td>
<td></td>
</tr>
<tr>
<td>Subcontractor risk</td>
<td>The risk of subcontractor (first-tier and below) defaults or insolvency. This risk may arise at the construction and/or operations phases of the Project.</td>
<td>Subcontractors must have expertise, experience and contractual responsibility for their performance obligations.</td>
<td>Private Party.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replacement subcontractors to be pre-approved by the Relevant Government Institution.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Due diligence by the Relevant Government Institution must include review of subcontracts to confirm the pass through of risks down to the subcontractors.</td>
<td></td>
</tr>
<tr>
<td>Risk</td>
<td>Description</td>
<td>Possible Mitigation</td>
<td>Possible Allocation</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>Tax rate change risk</td>
<td>The possibility that changes in applicable tax rates or new taxes may decrease the anticipated return on equity.</td>
<td></td>
<td>The Private Party’s unless unforeseen adverse action by the Relevant Government Institution that discriminates only against the PPP.</td>
</tr>
<tr>
<td>Technology risk</td>
<td>The possibility that the technology inputs for the outsourced function may fail to deliver the required output specifications, or technological improvements may render these technology inputs out-of-date.</td>
<td>Obligation on Private Party to refresh technology as required from time to time to meet the output specifications. Penalty deductions for failure to meet output specifications.</td>
<td>Private Party.</td>
</tr>
<tr>
<td>Utilities risk</td>
<td>The possibility that the utilities (e.g. water, electricity or gas) required for the construction and/or operation of a project may not be available.</td>
<td>Emergency back-up facilities or contracts Special insurance (project delay or other business interruption insurance).</td>
<td>Private Party unless the Relevant Government Institution is the responsible Utility provider</td>
</tr>
</tbody>
</table>