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## Funding universal broadband

### Public-private partnerships show the way



An ITU report entitled “Developing successful public-private partnerships to foster investment in universal broadband networks”, provides practical guidance on how to improve access to broadband in unserved and underserved locations. Released as part of ITU’s series of broadband thematic reports, it draws on studies of 13 projects that rely on various forms of public-private partnerships (see map). It also indicates how governments can use such partnerships to develop applications and services as a way of stimulating broadband take-up.

The projects provide insights from both emerging and developed markets, highlighting the use of a wide variety of technologies, investment models and funding sources.

#### Funding models for public-private partnerships

There are a number of models for funding public-private partnerships.

In the “bottom-up” or local community model, a group of end users, such as residents or businesses, form a jointly owned organizational group (frequently a cooperative), which oversees the network building contract. The public sector has no role in owning or running the infrastructure.

In the private design, build and operate model, a private-sector company receives public funding (often a grant) to assist it in deploying a network that offers open wholesale access. Again, the public sector has no role in owning or running the network. Where sufficient funding is available to attract interest from operators to work in rural areas, and where the operations of the network can be effectively transferred to an operator with little ongoing control from the managing authority, this model is more appropriate for larger-scale investments than the bottom-up model.

In the public outsourcing model, a single contract is awarded to a private-sector organization covering all aspects of the design or construction of the network. The infrastructure is built and operated by the private sector, but the public sector retains ownership and some control. This model is appropriate for widespread deployments where the managing authority requires a high level of control over the network, and where the private operator prefers greater financial stability – albeit with a potentially lower return – than that offered by the private design, build and operate model.

In the joint venture (partnering) model, a private-sector organization builds and operates the network, while the public sector manages all aspects of deployment and operation. Of the 13 projects studied for the report, only “The East African Marine System” (TEAMS) follows this model. The TEAMS project aims to deploy a 1.28 Terabits per second submarine optical fibre cable between Fujairah (United Arab Emirates) and Mombasa (Kenya) to provide access to international bandwidth.

The public design, build and operate model is appropriate when a managing authority needs to have absolute control over the operations of the network, or when it is confident that a targeted investment will inspire investment from other sources. An example is the “Qatar National Broadband Network” (Q.NBN), funded through government grants. The project will accelerate the deployment of fibre-to-the-home (FTTH) and deliver more than 95 per cent coverage by 2015. The network is wholly owned by the Qatari government and offers equal, non-discriminatory access, enabling any operator to use the infrastructure to deliver services.

#### Broadband projects and their sources of funding

Financing from universal service funds and government grants predominate among the projects highlighted in the report, with a small number relying partly or wholly on external funds.

##### Universal service funding

Four of the projects featured in the report use universal service funds to drive development. The Dominican Republic’s “Rural Broadband Connectivity” project will provide broadband access of at least 128 kbit/s to rural communities through asymmetric digital subscriber line (ADSL) and universal mobile telecommunication system (UMTS). A universal service fund was created to support this project, although the winning bidder, Codetel, chose to use some unassigned spectrum that was available for no fee instead of taking the available funding. Operators contribute 2 per cent of their gross income to the universal service fund.

The Saudi Arabia “Universal Service” project will deliver a minimum of 512 kbit/s broadband access to unserved and underserved locations using wireless technology. Saudi Arabia’s telecommunication regulator, the Communications and Information Technology Commission, established a universal access and service policy in 2006. Following consultation with industry, a universal service fund was created to fund this policy. The fund, into which operators pay 1 per cent of their revenues, is used to support operators in providing mobile voice and broadband Internet access to unserved or underserved communities.

A further example of universal service funding is the Mongolia “Information and Communication Technologies Infrastructure Development” project to provide broadband access in rural locations using a combination of Wi-Fi, very small aperture terminal satellite links and an already installed core optical fibre. Along with external financing from the Government of Japan and the World Bank, the Government of Mongolia established a universal service fund that takes 2 per cent of operators’ annual taxable income. Between December 2006 and 2010, the fund accumulated USD 7.5 million.

Pakistan also created a universal service fund in 2006 to support its “Universal Service Broadband Programme” to improve broadband access (minimum 128 kbit/s). The government has provided grants from the fund to operators to deploy core broadband access to unserved urban areas and rural communities.

In Paraguay, the government uses the universal service fund to provide grants to operators to implement the “National Telecommunication Plan”. The plan will provide broadband access at a minimum speed of 512 kbit/s to underserved and unserved areas by deploying core and backhaul optical fibre cable, ADSL and mobile technologies.



## Government grants

Grants were used to support around half of the broadband projects studied for the report, often in tandem with universal service funds or external funding. The projects awarded government grants follow a variety of investment models: public outsourcing; public design; build and operate; joint venture; and private design, build and operate.

The “Argentina Connected” project will triple backbone optical fibre infrastructure by adding 30 000 km of optical fibre cable by 2015. It has relied on government grants to fund a core and backhaul fibre network to provide regional connectivity and facilitate broadband access in unserved and underserved locations. Although Argentina created a universal service fund in 2007, with operators contributing 1 per cent of their revenues, the project has not drawn on the fund so far.

The Malaysia “National Broadband Initiative” relies on a mixed funding model. Government grants support FTTH technology to deliver high-speed broadband download speeds of between 10 Mbit/s and 100 Mbit/s to the main economic areas, while the universal service fund is being used to bring broadband to other areas using ADSL, wireless high-speed packet access (HSPA) and WiMAX.

Singapore’s “Next-Generation National Broadband Network” project and Malaysia’s “National Broadband Initiative”, as well as Qatar’s Q.NBN project, rely wholly on government grants.

Singapore is using USD 2 billion of government grants to fund the roll-out of its fibre-to-the-home network, through a private design, build and operate model. The network will connect 100 per cent of the population (homes, schools and businesses) by 2015 and is expected to deliver 1Gbit/s download and 500 Mbit/s upload speeds.

The Government of Malaysia is funding the “National Broadband Initiative” through a private design, build and operate model in conjunction with Telekom Malaysia to provide an open-access broadband network on a commercially negotiated wholesale basis.

## External funding

External funding provided by organizations such as the World Bank and the European Regional Development Fund (ERDF), or by foreign governments, has been used to finance a few of the broadband projects discussed in the report.

In Latvia, a “Next-Generation Network for Rural Areas” is being funded entirely by the ERDF, which will provide EUR 119 million by the end of 2018.

Lithuania's "Rural Area IT Network" (RAIN) project employs mixed funding, with government grants alongside funds from the European Bank for Reconstruction and Development. Using a public design, build and operate model, the project will deploy a nationwide backhaul and core network to improve the connectivity provided by existing access infrastructure and to improve broadband access.

Slovakia's "National Broadband" project to provide a backhaul/core network to serve rural and unserved areas is being jointly funded by the Government of Slovakia (EUR 11.32 million), the ERDF (EUR 96.22 million) and operators (EUR 5.66 million).

All three projects had to meet strict criteria in order to obtain State aid approval from the European Commission by demonstrating that public funds are being used appropriately.

## Seven best practices for successful projects

To assist authorities tasked with managing public-private partnership projects for universal broadband, the report identifies seven best practices, which can be summarized as follows:

- conduct a public consultation;
- consider multiple investment models and funding;
- be technology-neutral;
- conduct pilot projects;
- provide funding in line with milestones and targets;
- ensure open access and monitor compliance;
- create initiatives to stimulate demand.

### Conduct a public consultation

A managing authority should consult all potential stakeholders, including end users, telecommunication operators, other government agencies, local authorities and equipment vendors. Such consultation can provide critical information on matters such as requirements for broadband access, likely level of demand, consumers' willingness to pay for services, operators' interest in participating in broadband projects, and the most suitable technologies and investment models. The consultation can also consider other projects that the managing authority may initiate to stimulate demand for broadband access.

The Dominican Republic's "Rural Broadband Connectivity" project demonstrates the value of consultations by the managing authority. The regulator, Indotel, conducted a consultation with industry stakeholders and end users to determine the need for Internet services, assess willingness to pay, identify the telecommunication infrastructure available or planned, and discuss the challenges in deploying broadband infrastructure to rural locations.

Introducing a broadband plan without a proper consultation process may result in a lack of participation from operators, the use of an unsuitable mix of technologies, and limited take-up by the intended end users.

### Consider multiple investment models and funding

A broadband project for backhaul/core and access networks, or for a mix of national, urban and rural deployments, may consider combining different investment models and sources of finance. For example, the use of funding from a universal service fund may not be appropriate for a project to develop national backhaul/core and access networks if other funding sources are available, but would be appropriate for the part of the project delivering broadband access to unserved rural locations. When no other sources of funding are available, managing authorities may consider using a universal service fund to fund any part of a broadband project. Using more than one investment model for different parts of a broadband project provides the managing authority with different levels of control over the network deployed.

An example from the projects under review is "Argentina Connected", which employs a mixed investment model. The managing authority, ARSAT, is deploying and operating the national core network through a public design, build and operate model, but in large cities and regions where it does not have capability to deploy fibre, it subcontracts deployment via public outsourcing.

### Be technology neutral

Unserved and underserved locations are often in rural or remote areas, posing a challenge for the delivery of broadband access. In such areas, deployment should not be limited to one type of technology, and the fastest technology may not always be the most appropriate. ADSL technology will not be appropriate in locations lacking last-mile copper access, so wireless technology may be needed. In remote locations, backhauling broadband traffic may be problematic, and the use of fixed or microwave backhaul technology may not be appropriate, so satellite hubbing may be required.

The use of multiple technologies should be encouraged to attract more bidders for broadband projects. An example where the authority has encouraged the deployment of multiple technologies for broadband access as part of the bidding process is Malaysia's "National Broadband Initiative". In this case, ADSL, WiMAX and UMTS were considered as options to provide broadband access to regions outside the major economic areas.

### Conduct pilot projects

Pilot projects can be used by a managing authority to test the ability of the project to meet its objectives, and to identify risks and other issues that may arise. For example, in Saudi Arabia, the telecommunication regulator pilot-tested its "Universal Service" project. On successful completion of the pilot test, the regulator issued requests for proposal and awarded a number of contracts.

### Provide funding in line with milestones and targets

The timing of payments to the organizations implementing the project should be based on achieving agreed milestones and targets. These include milestones in the roll-out plan, and targets for the take-up of wholesale services by operators and service providers, and access to services by end users. Using such a mix increases the likelihood of a successful project, not only in terms of physical roll-out, but also in terms of adoption by service providers and end users. The ultimate success of a broadband project depends not only on making sure that broadband is accessible to end users, but also that it is actually used by them.

An example of the use of milestones is the Pakistan "Universal Service Fund Broadband Programme". An operator is required to obtain a predetermined number of

## Ensure open access and monitor compliance

A good example is the Latvian “Next-Generation Network for Rural Areas” project. The Latvia State Radio and Television Centre, a non-profit public enterprise, is obliged to provide wholesale services under equal access conditions on a non-discriminatory basis, and operators are able to access passive network infrastructure (ducts and fibre) and use space in cabinets to deploy their equipment.

Rolling out infrastructure alone does not ensure the success of a broadband project; this is achieved only when there is increased access to broadband services. To this end, it may be necessary to stimulate demand, for example by providing free or subsidized laptops or netbooks, by establishing community centres to educate people in the use of broadband, and by providing general ICT training. Such initiatives can easily be incorporated into broadband projects, and can be funded publicly, privately or through public-private partnerships.

As well as making services available, it is essential to advertise them to the local people. With the roll-out of the “Next Generation National Broadband Network” in Singapore, the operator (OpenNet) informs households by letter that the fibre network is soon to reach their location.

There is no one-size-fits-all solution to building a successful partnership for broadband infrastructure projects. But by adopting the practices highlighted in the ITU report, such as holding public consultations to identify risks, setting milestones which operators need to achieve to be paid, and marketing new services to drive demand, managing authorities can be more confident of achieving the developmental aims of investing in broadband expansion.