

# Open access networks: driver or inhibitor of affordable broadband in South Africa?

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*Prepared by:*

*Alison Gillwald*

*Steve Esselaar*

*Broc Rademan*

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<sup>1</sup> This is a working paper, not for citation. For alerts on policy paper publication or feedback to authors please contact [brademan@researchictafrica.net](mailto:brademan@researchictafrica.net) or [cchair@researchictafrica.net](mailto:cchair@researchictafrica.net).

## Abstract

Despite its policy currency, there is seldom a thorough analysis of Open Access effects, acknowledgement of policy tensions that arise from its application or an assessment of the regulatory capacity required for its realisation in developing countries. As yet there is little evidence that mandatory Open Access networks have increased competition, decreased pricing and stimulated demand as intended by various modes of Open Access regulation. Moreover, there is already a strong body of evidence (Bauer and Bohlin, 2008) from mature markets indicating that the adoption of mandatory Open Access network strategies may come at the expense of investment and innovation. Further, the evidence from mandatory Open Access initiatives demonstrates the requirement for sophisticated policy planning and regulatory execution that is seldom found in developing countries and has failed in countries with far stronger institutional endowments.

However, there is growing evidence that *voluntary* adoption of OA driven by commercial imperatives and assuming an enabling, or at least unrestrictive, policy environment can contribute to national objectives of broadband network extension and enable service-based competition under conditions that are not dependent on the sophisticated regulatory techniques required for Open Access. This paper draws on different policy and regulatory mechanisms to assess Open Access as a regulatory instrument in South Africa. It assesses Open Access based on South Africa's national broadband policy's requirement to explore Open Access strategies in order to extend affordable high-speed connectivity. The evidence shows how voluntary adoption of Open Access is increasing competition while improving access and affordability.

*Keywords: openness, open access, networks, investment, competition, pricing, innovation.*

## Introduction

Arguably, the greatest ICT policy challenge facing governments all over the world for the past decade has been stimulating the necessary investment in next generation broadband networks (NGNs) needed for an economy to be globally competitive. There is mounting evidence that broadband improves the flow of information, thereby reducing transaction costs, improving business efficiency, and creates jobs stimulating economic growth and enhancing well-being.

Confronted by a lack of resources to build these high-cost infrastructures and the lack of resources for facilities-based competition that has driven down prices and driven up broadband

penetration in many of the more mature competitive markets, Open Access (OA) has gained widespread and often uncritical acceptance amongst African countries over the last few years. The OA models of the European Union, multilateral and donor organisations such as the OECD (2013) and the IDRC (2010) have diffused into the continent.<sup>2</sup> In the regional context of this study, the Southern Africa Development Community (SADC) developed guidelines on OA in 2015 on instruction of the SADC Communications Ministers following an AU meeting where OA guidelines, though not adopted, were widely supported.

At this point, it is critical to distinguish between 1) the mandatory imposition of OA on dominant networks versus 2) the voluntary adoption of OA by commercial networks. In the first instance, OA principles of non-discrimination and price transparency are imposed on a dominant network that exhibits significant market power. Briglauer *et al* (2013) find that the imposition of cost-based mandatory wholesale access in the EU has resulted in slower roll-out of fibre-based infrastructure than deregulatory (United States) or state-aid approach (Asian countries). Similarly, Bauer *et al.* (2008) find that mandatory OA networks have not necessarily increased competition in services, decreased pricing and stimulated demand; yet OA may come at the expense of investment and innovation (Bauer and Bohlin, 2008). In the second instance, voluntary adoption of OA takes place when commercial enterprises act on commercial imperatives in order to optimise the use of the network and maximise their return on investments as quickly as possible.

### **Moving from mandatory to voluntary Open Access**

Balancing the primary objectives of affordable access to high-speed bandwidth with enhanced competition, investment, and innovation, requires sophisticated policy planning and regulatory execution seldom found in developing countries. These trade-offs need to be assessed not only by means of static efficiency such as price caps and instrumental competition models (market concentration and integration), but also through dynamic efficiency indicators (complementarity, infrastructure and revenue sharing). Developed economies with far stronger institutional endowments than those available in most developing countries have struggled to create the correct incentives and penalties to balance these policy tensions. Evidence suggests that until regulatory effects are clearer, regulators should forebear. They should be focusing instead on

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<sup>2</sup> See OECD discussion paper presented to the AU (2010).

infrastructure sharing, channeling complementary investments and, as Briglauer *et al* (2013 and 2015) argue, move to an industry coordinating role by enabling cooperation models.

Smith and Reilly (2013) correctly question the desired level of openness in order to achieve the best developmental outcomes: "Openness is a means not an end" (2013:8). They make the important point that harnessing the power of openness, especially in relation to networks, requires structure – OA networks are not simply *un*-closed or unregulated (2013:8). Furthermore, the high sunk costs of infrastructure-heavy industries tend toward the creation of monopolies or imperfect markets in which entry and exit is not free; hence they require regulation. If they are to be made open, they will require different incentives, funding or ownership for investment. In this context, Pathminder and Gurumurthy (2013:33) express concern about openness entrenching those who already have power as well as the possible opportunity costs of quality, price or investment incentives.

## **Voluntary Open Access**

The outcomes of mandatory OA as applied primarily to fixed markets, such as the creation of wholesale Open Access networks through structural separation or local loop unbundling to deal with monopoly access networks, has been highly uneven. There is growing evidence of the unintended consequences resulting from such interventions - such as the inhibition of investment and innovations (Bauer and Bohlin 2008). There is even less evidence of successful mandatory OA being successfully applied over wireless infrastructure. With the dominance of mobile broadband in developing and emerging economies, Governments have looked to OA as a solution to overcoming extreme dominance in mobile markets or intractably high prices. These first attempts to implement mandatory open access wireless networks in Mexico and Kenya have not proved successful, and consultants commissioned by Government have advised against it. Voluntary OA, however, is showing initial signs of being a successful alternative, though one that requires a different set of regulatory skills. The success of voluntary OA is being driven by new business models and generally share these characteristics:

- generation of high network traffic incentivised by the need to offset its investment costs;
- wholesale providers only, independent and separated from the retail layer.

Voluntary OA also takes place where the provider anticipates regulatory requirements being imposed in the future. An example is Telkom South Africa's voluntary separation into wholesale

(Openserve) and retail networks. Though, as BEREC (2011) more generally notes, "should the requirement not materialise later, the commitment would no longer be incentive-compatible".<sup>3</sup>

The incentive framework is the key to understanding how voluntary OA can work. Where the operator is not vertically integrated, the incentive is to sell wholesale access to as many customers as possible. Operators such as C-Squared in Uganda provide wholesale national transmission access only in order to ensure that as many customers as possible can purchase access to its network.

Understanding OA needs to consider the political economy of the country or region, its institutional arrangements, and the enabling environment for alternate business models and market structures that might avoid overly demanding big-build projects and prefer less resource-intensive regulation. In each OA case, the theory and practice of 'openness' requires critical engagement with the public policy rationales for its application, the resources required and available for implementation, and the consideration of unintended consequences observed from other jurisdictions.

## Methodology

Following the definition and drivers of OA, which is only briefly summarised here, a conceptual framework is constructed through which the South African case is analysed. OA is examined in the context of the South African political economy to assess, within its particular market and institutional arrangements, how its principles are being applied at different levels of networks, and where it could be better applied, if at all.

The research is undertaken in the form of an empirically rich case study "that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2003: 13). Further, the case study approach allows for the use of multiple sources of empirical data which improves the reliability of the results because "any finding or conclusion in a case study is likely to be much more convincing and accurate if it is based on several different sources of information" (Yin, 2003: 98).

The empirical evidence has been gathered from secondary sources, such as policy and regulatory documentation, through document analysis. This is complemented by primary evidence gathered

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<sup>3</sup> See BEREC (2011: p. 36).

for the case from high-level interviews with operators, government officials and service provider associations. This evidence has been coded and triangulated between interviewees and against secondary sources to provide a comprehensive analysis of the evolution of OA in South Africa, focusing on the current policy context of broadband extension. The key question is whether the models that have emerged to meet the demand for wholesale access are stimulating investment and enabling innovation without increasing digital inequality.

Overall, this paper asks under what conditions can OA network policy and regulation frameworks successfully fulfil national public policy objectives of affordable and equitable access to broadband whilst stimulating investment and innovation?

## Definition of Open Access

The concept of Open Access (OA) is unusual in the sense that there is no single, formal definition that has been adopted by a wide range of institutions despite its common use in regulation. The OECD, ITU, NEPAD, BERC, and the European Commission have generally accepted a set of OA principles but not a common definition. Common OA principles amongst all of these organisations include (1) non-discrimination and (2) price transparency. Non-discrimination can be defined as equal or non-discriminatory access to networks and wholesale services that is to prevent incumbents from favouring their own upstream or downstream operations over competitors. This projection of market power across market segments, "*vertical foreclosure*", undermines competition and tends to result in a reduction in societal welfare. (CRASA 2015)

OA principles may be enshrined in laws and license conditions, in contracts, or in regulation, for example, wholesale access obligations or imposed structural or functional separation. A practical definition proposed by Krämer *et al* (2013) is used for the purposes of this paper:

"Open Access regulation refers to the mandated or voluntary provision of access to an upstream resource which must be based on the principle of non-discrimination. The concept may apply to publicly or privately owned access providers that are vertically separated, integrated or represent a cooperative of multiple entities. Open Access regulation usually refers to the network layer, but may also be applied to other layers of the telecommunications value-chain".

## Drivers

The role users play in driving demand for data and Next-Generation Networks (NGN) (Iden and Leif 2012); the investment required for new technologies and its associated cross-sector coordination (Quigley

2004, Briglauer and Gugler 2013); as well as the overly simplistic definitions used by operators are all drivers of market intervention, adoption of OA regulation, and voluntary OA adoption by firms (Boyer 2005).

These drivers have resulted in the tension between competition and investment coming to the forefront (Kathuria 2015) and it has been particularly highlighted by data from the EU's lagging NGN (Briglauer *et al*/2013; Briglauer *et al*/2015). A similar set of circumstances has arisen in Africa where investments in NGN, though greatly improved by the wireless sector, are also perceived to be lagging (CRASA 2014). Benkler *et al* (2010) provide a useful taxonomy of relationships between competition and investment to which the 2015 analysis of Briglauer is added. The authors outline six approaches from these:

1. Reduced incentive to invest — enforced access regulations reduce investment because firms will be required to share their networks at artificially low rates.
2. Time-based trade-off between competition and investment — choice between investment in the short term but no competition; or competition in the long term (and investment) but no investment in the short term.
3. Ladder of investment hypothesis — movement from service-based competition to facilities-based competition does not occur without effective regulation.
4. Competition means investment — however, too much competition can disincentivise investment (Aghion *et al* 2005).
5. Constantly adjusted competition — Ideal investment levels are reached by smaller firms threatening the operations of large ones, however, this requires great regulatory capacities.
6. Benkler *et al* (2010) focus more on passive infrastructure and channeling complementary investments and, subsequently, Briglauer *et al* (2013 and 2015) move away from an asymmetric regulatory paradigm “to a more symmetric one focusing on an industry coordinating role and enabling cooperation models in the actual building and sharing of infrastructure”. (Briglauer *et al*/2015)

After considering the tension and complementarities between competition and investment, as well as the shift needed from more instrumental static competition and economic regulation to more dynamic approaches that acknowledge complementarity in the market, this paper adopts the latter approach naming it the “complementarity approach”, which appears most suitable for those problems to which OA is seen as a solution: encouraging investment while ensuring fair competition (CRASA 2014) and assembling the appropriate incentive framework to ensure that the policy goals of improved access and affordability are achieved

## Conceptual Framework

This conceptual framework (Figure 1) is based on three dimensions derived from the various definitions and characteristics of OA emerging from the literature: the *market structure* denotes

how ownership (and management) in the network and activities in the services layer are related; while the *ownership structure* denotes the business model and goals of the access provider that vary with the influence/control of the public sector. The *access levels*, categorised here as international data transmission; national data transmission<sup>4</sup>; and end-user access, can be linked to specific network elements in different markets (including wireless mobile). They are purposefully broad to capture where the bottlenecks, or potential bottlenecks, have been identified.

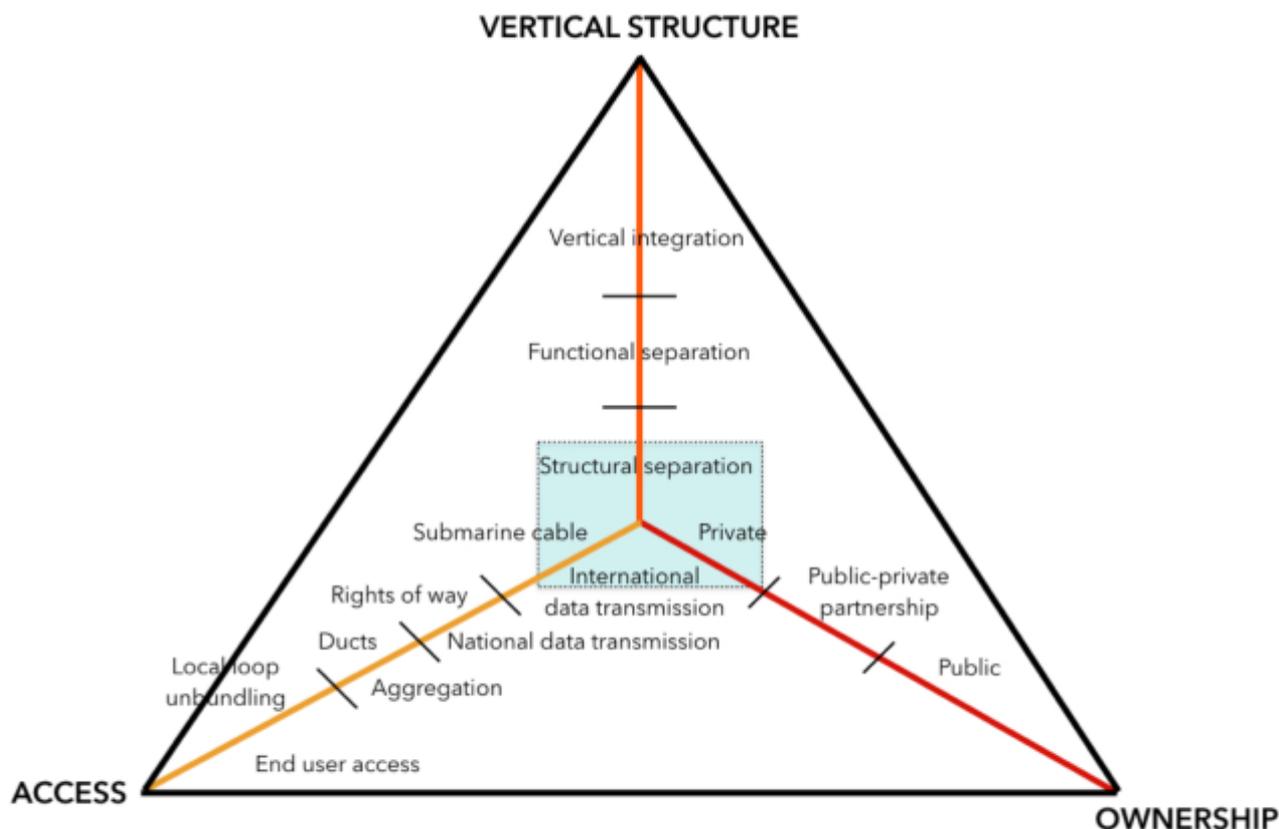
“The access level, finally, indicates at which level of the value chain access is given to downstream competitors. Available access levels depend on the network architecture and may differ across access technologies. Access may also be granted at different geographical locations. The access level defines the degree of control and the potential quality differentiation that the access seeker can achieve” (Krämer and Schnurr 2014, p. 6).

Drawing on Krämer and Schnurr (2014, pp. 10-11), the framework combines these dimensions to conceptualise the relationships between the market structure, forms of ownership and the points of access along networks. The most open elements can be visualised at the centre of the triangle (in the blue box) with the more closed elements being on the outer edges. The blue box represents current variants of voluntary OA models found in the South African market: the open undersea cable consortium model of Seacom as an example of international carriage; the OA commercial models of national transmission fibre companies; and the open access to a common wholesale carrier network that structural separation of a vertically integrated incumbent permits. Access relationships are primarily defined by the market structure and the ownership model, whereas the access level defines the range of the particular relationship. From the relationship between market and ownership structures one can identify the bottleneck in the networks. The potential of OA strategies can then be assessed by their ability to diminish barriers to the range of access levels relevant for that relationship, thereby enhancing market efficiency and potentially circumventing market failure. For example, the ‘vertically integrated; publicly owned’ relationship

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<sup>4</sup> For the purposes of this model, national data transmission includes: backbone, backhaul and aggregation networks.

could cover a deep range of access levels creating a bottleneck and warranting structural



separation for downstream service providers to gain access to the backbone.<sup>5</sup>

## The Case of South Africa

### Policy and regulatory background

Access regimes can serve to make facilities available that might otherwise have formed bottlenecks to other network operators. The initial telecommunications reforms in the mid-1990s, that helped establish an independent regulatory authority and the liberalisation of markets, introduced the first transparent access regime through interconnection and facilities-leasing guidelines proscribed by the new South African Telecommunications Regulatory Authority (SATRA). This followed the OA approaches in reforming markets all over the world that required

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<sup>5</sup> OA should only be considered when there is a clearly identified obstacle to competitive entry or access.

public network operators, especially former or existing monopoly facilities providers, to access incumbent bottleneck network facilities under regulated terms and conditions, as well as ensuring the ability to interconnect networks. Furthermore, OA was seen as a policy mechanism to aid “the regulator [which] by itself had not been able to bring down the prices of underlying infrastructure.” (Roux interview, CSIR, 2016)

### **SA Connect**

As with many other policies, South Africa was quick off the mark adopting a broadband policy in 2009. However, it was hurried through the necessary public processes without much adjustment, unfortunately resulting in an old-style telecom infrastructure supply-side approach. In 2013, South Africa’s new broadband policy and plan, “SA Connect”, was eventually published after the first broadband policy failed to meet the ICT challenges laid out in South Africa’s National Development Plan (NDP) 2030.

The Policy identifies “structural constraints” in the sector as something that an OA network could overcome as well as the satisfaction of pent up demand for affordable broadband. The regulatory regime will need to ensure that “access is open to any operator or service provider on cost — including fair rate of return, and non-discriminatory bases.” The sharing of resources and infrastructure, including spectrum, is further seen as a responsibility of the regulator, ICASA, to encourage services-based competition in the market.

SA Connect proposes an open and competitive mechanism to support the extension of broadband to underserved areas, however, direct state funding was not available for the amount anticipated by Telkom (reduced to ZAR 47 billion after an original estimation of ZAR 60 billion). It nevertheless proceed with voluntary structural separation in its network and services, positioning itself to take on the role as a national OA common carrier.<sup>6</sup> Treasury then indicated that around ZAR 300 million had been made available annually in the medium expenditure framework for this capex outlay.

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<sup>6</sup> Structural separation also prepares it better from a competition point of view for the absorption of Infracore as part of the intended rationalisation of state owned entities.

## **Mandatory OA in South Africa**

### **LLU**

The rationale behind LLU is to foster competition and reduce telecommunications costs by eliminating the large investments required for last-mile infrastructure (RIA 2010). LLU is provided for under the ECA and was to support the entry of the second network operator. Despite ICASA having identified four possible options for unbundling there are no regulations in place. With the copper network relatively limited and the process delayed, it was somewhat overtaken by mobile broadband, which provides access network coverage across the country with 3G and LTE networks.

### **National broadband wholesale company**

The fibre-optic networks of the public train network (Transnet) and the power utility (Eskom) were set aside for the second network operator which formed Broadband Infracore (BBI). Although formally an OA public company wholly owned by the state, BBI provided wholesale bandwidth exclusively to Neotel on a cost-plus basis. However, it is currently in a state of abeyance as "[it] is unable to execute its corporate plans in terms of reaching its statutory mandate because of under-capitalisation." (Nkhereanye interview, BBI, 2016)

## **Voluntary OA in South Africa**

### **International data transmission**

The competitive provisioning of undersea international bandwidth to the incumbent club consortium that made up the monopoly SAT-3 cable, takes the form of OA network providers like Seacom, whose commercial logic is similar to the shared dark fibre national transmission networks described above, or the shared infrastructure consortium that operates the WACS cable. These various consortia are made up of multiple competing subsea cable companies and do not form a cable monopoly with multiple owners.

Competition, and the OA logic that seeks to maximise traffic on networks to optimise return on investments, have driven down prices as much as 80% (Clatterbuck interview, Seacom, 2016). While the cost of international bandwidth used to be 80% of ISP input costs, it is now closer to 20% and national transmission, which has reduced far less dramatically, now makes up the significant portion of the cost for smaller ISPs who are not able to enter into mutual peering arrangements (Ant Brooks, ISPA 2009; Clatterbuck interview, Seacom, 2016).

## National data transmission

By the time the Electronic Communications Act (2006 convergence legislation) became operational, there had been a significant amount of commercial co-ordination and complementarity of investments between a number of fibre networks including Fibreco; the joint build-out of the multiple-operator backhaul network by Neotel, MTN and Vodacom; and the Neotel and Broadband Infracore networks.

Moreover, when service providers were legally bound to acquire their backbone and backhaul networks from fixed incumbent Telkom, and later waited for the national broadband carrier to roll out its network, Dark Fibre Africa (DFA) started rolling out 8 000 km of ducts and fibre in major metros and secondary cities providing wholesale dark fibre on an OA basis (MyBroadband 2014). By this time the mobile operators chose to self-provide their backhaul networks and DFA had rolled out all the major metro and intercity routes. Through this underground infrastructure, any operator with a communications license can run a fibre network.

Wholesale OA networks created through structural separation are generally characterised by high sunk investments unfeasibly replicable, and sometimes by restrictive competition that discourages investment. In 2013, Telkom which had been partially privatised in 1996, was required by the Competition Commission to functionally separate its activities as part of the remedies imposed following it being found guilty of anticompetitive practices. Following several proposed turn-around strategies, including complete privatisation and re-nationalisation, Telkom voluntarily undertook to separate structurally. (Padayachee interview, Openseve, 2016)

Its new "Open Access" wholesale division - 'Openseve' - offers broadband access to internet service providers including Telkom on the grounds of 'term' and 'volume'. Additionally, they have decided to peer publicly at NAPAfrica with other network operators and have declared an IPConnect price reduction of up to 57 percent (MyBroadband 2016). But the fibre market is growing and the plethora of last-mile FTTx companies is placing pressure on the incumbent. "There is sufficient competition across the spectrum but it does not just come from one sort of player. With us being the largest player out there, there comes some more [pressure] like this, which compels us to up our game." (Padayachee interview, Openseve, 2016)

Long distance "inter-city" fibre-optic transmission is provided by a number of competing networks and state-owned companies (SOCs). Partially state-owned incumbent Telkom's network is the most extensive at over 50 000 km of unduplicated fibre. BBI, which covers the major

national routes, is the second most extensive network but only a fraction of Telkom's. The high-demand routes between Johannesburg, Cape Town and Durban are complemented by DFA and FibreCo; East London and Musina are serviced by FibreCo and Liquid Telecom respectively.

The wholesale market did not enjoy the workings of voluntary open access principles subsequent to the entry of BBI's alternative broadband service offerings. What became clear in that period was the lack of guaranteed open access adoption and wholesale price reductions after extending the state's ownership of broadband infrastructure entities. However, such results did eventually come about after privately-owned entities began to compete in the long-distance fibre networks. The co-build by MTN, Neotel and Vodacom competes with Fibreco on the main intercity routes directing the latter to focus on secondary uncovered routes. As described below, competition in the backbone and backhaul has been driven by the commercial OA models of the dark fibre companies who need high traffic volumes to optimise investments and wholesale pricing.

"[O]wning a piece of infrastructure, which is so important to MTN and Vodacom that they are willing to duplicate, and by giving them that at a lower price-point by sharing it, you are effectively negating the need for them to duplicate. All of that activity lowers the input cost of the infrastructure compared to what it would be if you did not have a more open model." (Hussein interview, Fibreco, 2016)

Government could aggregate public sector demand and smart procurement of high-capacity networks.

"If the demand [in a certain area] is largely driven by a public sector requirement to roll out SA Connect and other things because the community is not economically active then rather give [the service provider] the anchor tenancy and [it] will raise the money [...] It could be for an SPV owned 100 percent by the province. [...] It would be run according to those project financing principles [that would aggregate demand for high revenue]." (Hussein interview, Fibreco, 2016)

Rather than the State subsidising builds that might leave a series of random OA links; let Government identify the public points requiring connection (backbone and access) and procure connectivity to those points. This model produces greater private sector incentive by leveraging less State opex. The OA logic of this commercial model, as already practised by DFA and Fibreco, is that the operator needs to get as much traffic as possible on its network in order to maximise return on its investment and reduce its debt.

"Fibreco's funding structure consists of a certain number of entrepreneurs who put up a certain amount of equity and then as the management team have to go and pre-sell, design the network, cost it out, contract it, [...] go to customers and sell that upfront, get their commitment to pay us and Seacom [...] to get them to build the network within the timeline, then go to the bank to get the loan. [...] Then manage every part of the value-chain to make sure nothing slips between the cracks." (Hussein interview, Fibreco, 2016)

As the acting Director General of DTPS indicated: Commercial fibre "...has been one of the most phenomenal developments in the sector, a game changer, that demonstrated that open access networks are viable, unlike what the traditional operators have argued." (Mjwara, DTPS, 2016).

### **Metropolitan and provincial networks**

Most of the major municipalities have considerable core network infrastructure, dominated by Telkom's network infrastructure developed over many years, but many have added localised fibre networks (sometimes their own) to serve the needs of local government.

Herotel built and operates its own network (as Project Isizwe) with funding from the City of Tshwane, a model different to the City of Cape Town, which is dedicated to rolling out a mesh network to fill all the uncovered spaces throughout the city. Another model is the Western Cape's broadband project procured through SITA and won by Neotel, which attempted to implement an OA regime and introduce service-based competition but the only service for citizens is a public Wi-Fi network. (Johnson interview, Western Cape Government, 2016)

While these developments have improved broadband connectivity and overall city competitiveness in the absence of national policy and implementation, its uncoordinated manner has resulted in the duplication of networks and created a bureaucratic bottleneck in private sector rollout. Nevertheless, the thinking behind it was "Let us get some cities connected and try and gear the Government to buy in bulk, but in the longer term the conversation still needs to take place regarding how we build the network." (Roux interview, CSIR, 2016)

### **Last mile access: Fixed networks**

The real challenge in South Africa lies in the access network where historically the fixed network serviced white communities predominantly in urban areas. The extension of the copper networks through the privatisation of Telkom was a failure and demand stimulation came from the mobile

operators who, with the introduction of 3G, were able to provide data at lower cost and better quality than Telkom's ADSL.

Possibly fearful of cannibalising its ADSL service and going through a management and leadership crisis following mixed signals from various government administrations on further privatisation of state holdings, Telkom was again slow to invest in fibre. The demand for fibre by business and high-end residential users was snapped up by dark fibre companies and localised providers. Fibre-to-the-premises (FTTP) is now being offered by commercial operators in addition to mobile, fixed wireless and ADSL services but mostly to the wealthy suburbs of large cities. Having said that, the commercial OA models being practised in South Africa currently will not fully reach the underserved areas, and even by offering anchor tenancy, the network will only reach as far as existing public service demand. Nevertheless, commercial operators believe that with guaranteed government revenue and OA practices that drive local traffic through the networks, costs can be brought down for commercial actors to meet at least some of the pent up demand in rural areas (Hussein interview, Fibreco, 2016).

#### **Gaps in the broadband network: Mobile networks**

Mobile network operators (MNOs) can help extend the network with their heavy infrastructure investments and revenue. As mobile data takes responsibility for growing the retail market in South Africa – 30 percent year-on-year growth and accounting for 61 percent of total retail revenue in 2013 – MNOs are expected to enable further development of mobile applications and content. (Africa Analysis 2014) Achieving this in a context of sufficient competition, whilst avoiding those unintended consequences of delayed investment, requires the allocation of high-demand spectrum and forbearance on implementing a mandatory OA wireless regime that would siphon spectrum and threaten the incentive to invest. (CRASA 2015).

What the Government of South Africa is contemplating is how to oppose the dominance of Vodacom and MTN (76 percent combined market share), which they believe have not delivered affordable services to the country (without effective regulation) (Mjwara interview, DTPS, 2016). The acting Director-General, Joe Mjwara, said that a proposed OA regime applicable to all public operators had not been finalised during the ICT Policy Review before Cabinet in July 2016, but the proposed regime would expect all public operators to voluntarily separate their networks and services (as Telkom was doing) so that other operators and service providers could have open access to them. The regulator would be required to threaten mandatory OA if operators

resisted. He went on to explain how Ministry had received different views on the desirability and feasibility of an OA wireless network given that other social and economic issues had to be considered in addition to the optimal business case.

Mobile operators nevertheless believe Government has reached a position on OA in relation to wireless networks: Nkateko Nyoka, Chief Legal, Regulatory Risk Officer, explains what Vodacom understands the positions of Government to be:

“[Government] has come to the conclusion that Government needs to take the country in the direction of a single wholesale network which will be co-owned by Government and the operators. So as a starting point, they are saying all available spectrum as of today which has not been allocated will be given to a consortium that is going to construct this network. [...] Government will possibly have a golden share but [...] the troubling part of the proposal is they are saying over time, their expectation is that the spectrum that has already been allocated to operators will have to be moved to that consortium. So over time what is going to happen is, you are never going to have network-based competition, there will only be one common network and this common network is going to be owned by different investors including Government.” (Nyoka interview, Vodacom, 2016)

Those opposed to such a network argue that the conditions for long-term, relatively static undersea cable investments that lend themselves to contracting are quite different from the agility required by wireless networks. In the public consultation for SA Connect, for example, Vodacom and MTN publicly declared that if they could not control the spectrum they would not invest in any consortium and if the network would be providing low-cost spectrum they would simply lease spectrum from it.

In July 2016, the regulator decided it would auction the high-demand spectrum in the 2.6GHz and 700MHz and 800MHz bands (the so-called digital dividend spectrum) without reference to the spectrum policy that Government claims ICASA knew was being finalised (Mjwara interview, DTSP, 2016). Government then proceeded with legal action to prevent the auction going ahead (Minister of Telecommunications and Post vs ICASA and others 8 August 2016). The terms of the auction included a ZAR 3 billion reserve price for the two best lots of spectrum, which only the two dominant operators could likely afford. (ICASA 2015) The Acting Director-General said the haste “...with which ICASA wants to auction the spectrum puts the vested interests of two or three operators before the national interest, which must take into account constitutional and administrative issues.” He said the likely outcome of the ICASA auction, if it went ahead, would be the most retrogressive reform the country would ever have seen – it would simply reinforce

the status quo in terms of market dominance and fail to meet empowerment and affordable access objectives. (Mjwara interview, DTSP, 2016)

Whatever the assignment of spectrum, no artificial scarcity should be created to push up the price but there should be sufficient room in each block for operators to evolve their services (a maximum of three licenses instead of the current four). If one of those is to be an OA licence it should have at least one of the current licensees with competitive experience in it, and spectrum trading should be permitted to rectify an inefficient spectrum assignment, with controls on speculation or hoarding.

While this type of strong state intervention would jeopardise South Africa's broadband delivery; using license conditions to mandate rural connectivity prior to network-based competition in the most lucrative areas of the country would be less risky. A common network is also possible if constrained to servicing the uneconomic market spaces. (Nyoka interview, Vodacom, 2016) For wholesale ex ante regulation, the impacts on high levels of investment need to be carefully considered.

## Conclusions and Recommendations

Open Access has had a chequered history: multilateral organisations such as the OECD have seen it as the panacea to the challenge of providing affordable access to high-speed bandwidth. But large-scale projects require sophisticated regulatory capacity and massive resources and this is mostly missing in Africa, especially South Africa. It is safe to say ICASA is not nearly capable enough after having failed to implement the OA interconnection and facilities-leasing regulations. More than two years after SA Connect there has been no development in national broadband rollout. Nor is Government able to access the ZAR 60 billion billed for the project. In the context of limited capacity and resources, alternative approaches are needed that leverage private capital and skills, lower regulatory risk, and use the public sector's large broadband demand to incentivise private investment.

Various OA models adopted by undersea cable companies have driven up bandwidth capacity on the continent and dramatically reduced wholesale prices, making the cost of national IP transit a greater cost for service providers than international bandwidth. Reduced national transmission prices and extension into some secondary cities and underserved regions are results of commercial OA companies such as DFA and Fibreco having created competitive options to

Telkom on main intercity routes. This competitive pressure in the national data transmission market has compelled Telkom to review its strategy in the market and adopt an OA model – undergoing a voluntary structural separation of wholesale and retail divisions, which has largely been welcomed but failed to eradicate lingering scepticism and a belief that strong oversight from the regulator is still necessary.

The aggregating of public sector demand can be used to smart-procure tenders enhancing the viability of public and private operators. In underserved areas, where there is no backbone yet, public sector demand (school clinics, municipalities and public WiFi) can be offered as anchor tenancy to incentivise investment in sub-economic areas. By guaranteeing the demand, private sector players are able to secure the funding needed to roll out infrastructure. OA principles, in this context, make business sense because providing wholesale access increases revenue, the promise of which incentivises investment.

South Africa is seeing the fine-tuning of a viable, commercial, OA model in the end-user segment as private sector players roll out fibre to the home and voluntarily adopt OA principles to get as much traffic on their network as possible and ensure quick return on investment. Moreover, under the current regime, non-OA public operators would be required to provide access on fair and non-discriminatory terms anyway. Thus, OA principles can be seen as excessive and unnecessary.

Mobile operators have invested heavily in the wireless networks in addition to building their own fibre backhaul network but the lack of spectrum has hampered growth. Delays in the assigning of high-demand spectrum have been caused by the Government seeing this as an opportunity to propose open wireless networks and enable the entry of new players into the market. The complexities of these are extreme and require sophisticated understanding of the mobile market, which neither the South African regulator, nor the Ministry have.

As mobile operators are not subject to mandatory wholesale access regulation, it may be a condition of spectrum licences that roll-out conditions require certain underserved areas be serviced before the spectrum can be used in more lucrative markets; or regulatory oversight could enable wholesale access to their networks and facilities by other service providers and MVNOs.

Those in favour of OA point to the success of undersea cable consortia in commoditising international bandwidth while those opposed to such a network argue that the conditions for

long-term, relatively static undersea cable investments that lend themselves to contracting are quite different from the agility required by wireless networks.

WORKING DOCUMENT

## References

- Africa Analysis (2014). "Invitation to Apply for International Mobile Telecommunication Spectrum", ICASA, Pretoria.
- African Union (2010). "Open Access," August: pp. 1–72.
- Aghion, P., Bloom, N., Blunder, R., Griffith, R. and Howitt, R. (2005). "Competition and Innovation: An Inverted U Relationship", *Quarterly Journal of Economics*, May (No. w9269). Available at: <http://web.stanford.edu/~nbloom/PevertedU.pdf> (accessed 10 November 2015).
- Bauer, J. M., and Bohlin, E. (2008). "From static to dynamic regulation: recent developments in U.S. telecommunications policy", *Intereconomics: Review of European Economic Policy*, Vol. 43 (1): pp. 38-50.
- Benkler, Y. (2010). "Next Generation Connectivity: A review of broadband Internet transitions and policy from around the world", Berkman Centre for Internet and Society, Harvard University.
- BEREC (2011). „BEREC Report on Open Access“, BOR, 11 (05). Available at: [www.berec.europa.eu/eng/document\\_register/subject\\_matter/berec/reports/?doc=212](http://www.berec.europa.eu/eng/document_register/subject_matter/berec/reports/?doc=212) (accessed 15 November 2015).
- Boyer, M. (2005). "The Measure and Regulation of Competition in Telecommunications Markets." *SSRN Electronic Journal*, doi:10.2139/ssrn.873350.
- Briglauer, W. and Gugler, K. (2013). "The Deployment and Penetration of High-Speed Fiber Networks and Services: Why Are EU Member States Lagging Behind?" *Telecommunications Policy*, Vol. 37 (10): pp. 819–35.
- Briglauer, W., Gugler, K. and Haxhimusa, A. (2015). "Facility - and Service-Based Competition and Investment in Fixed Broadband Networks: Lessons from a Decade of Access Regulations in the European Union Member States", *ZEW - Centre for European Economic Research Discussion Paper No. 15-048*. Available at: [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2641082](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2641082) (Accessed 20 November 2015).
- Cave, M. (2007). "The Regulation of Access in Telecommunications: A European Perspective," April: pp. 1–29.
- CRASA (2015). "Towards a definition of Open Access", *Communications Regulatory Association of South Africa* (unpublished).

Government of South Africa (2013). *South Africa Connect: Creating Opportunities, Ensuring Inclusion*, Pretoria: South Africa.

ICASA (2015). *Invitation to Apply for Spectrum in terms of ECA Act*, Government Gazette, Vol. 613 (10177), 15 July 2016, No. 40145 of 2005.

Iden, J. and Leif B. M. (2012). "The Drivers of Services on next-Generation Networks." *Telematics and Informatics* 29, no. 2 (May 2012): 137–55. doi:10.1016/j.tele.2011.05.004.

Kathuria, V. "A Conceptual Framework to Identify Dynamic Efficiency", *European Competition Journal* Vol. 11 (2-3): 1–21. doi:10.1080/17441056.2015.1060006.

Krämer, J. and Schnurr, D. (2013). "A Unified Framework for Open Access Regulation of Telecommunications Infrastructure: Literature Review and Policy Guidelines", available at: <http://www.im.uni-karlsruhe.de/Upload/Publications/db090f03-0315-4aaa-8d09-8785a6455b3f.pdf>

(accessed 15 November 2015).

Krämer, J. and Schnurr, D. (2014). "A Unified Framework for Open Access Regulation of Telecommunications Infrastructure: Review of the Economic Literature and Policy Guidelines", *Telecommunications Policy*, Vol. 38 (11): pp. 1160–79.

ITU (2011). "Open access Regulation in the Digital Economy", GSR 2011 Discussion Paper, available at: [www.itu.int/ITU-D/treg/Events/Seminars/GSR/GSR11/documents/02-Open%20Access-E.pdf](http://www.itu.int/ITU-D/treg/Events/Seminars/GSR/GSR11/documents/02-Open%20Access-E.pdf) (accessed on 1 February 2016).

MyBroadband (2014). "XDSL signs agreement with Dark Fibre Africa and Conduct for more fibre, faster", available at: <http://companies.mybroadband.co.za/blog/2014/04/14/xdsl-signs-agreement-with-dark-fibre-africa-and-conduct-for-more-fibre-faster/>

MyBroadband (2016). "How much Telkom is cutting wholesale ADSL prices by", available at: <http://mybroadband.co.za/news/adsl/164344-how-much-telkom-is-cutting-wholesale-adsl-prices-by.html> (accessed 10 May 2016).

NEPAD (2010). "Draft Protocol on Policy and Regulatory Framework for NEPAD ICT Broadband Infrastructure Network for Africa", available at: [www.nepad.org/system/files/ENGLISH%20VERSION%20KIGALI%20PROTOCOLE%20\(2\).pdf](http://www.nepad.org/system/files/ENGLISH%20VERSION%20KIGALI%20PROTOCOLE%20(2).pdf) (accessed on 31 January 2016).

OECD (2013). "Broadband Networks and Open Access", available at: [www.oecd-ilibrary.org/docserver/download/5k49qgz7crmr.pdf?expires=1432245321&id=id&accname=guest&checksum=2C7CCD96E982A566C4CD20F2F2CAD9F6](http://www.oecd-ilibrary.org/docserver/download/5k49qgz7crmr.pdf?expires=1432245321&id=id&accname=guest&checksum=2C7CCD96E982A566C4CD20F2F2CAD9F6) (accessed on 1 February 2016).

Parminder, J. S. and Gurumurthy, A. (2013). "Establishing Public-ness in the Network: New Moorings for Development – A Critique of the Concept of Openness and Open Development", in *Open Development*, Smith, M. L. and Reilly, K. M. A (eds). MIT Press, Cambridge, Massachusetts.

Quigley, N. (2004). "Dynamic Competition in Telecommunications." Howe Institute Commentary, no. 194, available at: [www.cdhowe.org/pdf/commentary\\_194.pdf](http://www.cdhowe.org/pdf/commentary_194.pdf). (accessed on 28 February 2016).

Research ICT Africa (RIA) (2010). "South African ICT Sector Performance Review", Vol. 2 (6), available at: [www.researchICTafrica.net](http://www.researchICTafrica.net) (accessed on 20 March 2016).

Smith, M. and Reilly, K. M. A. (2010). "Introduction," in *Open Development*, M. Smith and K. M. A. Reilly (eds.). MIT Press, Ottawa, Canada.

TechCentral (2010). "Cell C tower-deal billions to pay off debt", available at: <https://www.techcentral.co.za/cell-c-tower-deal-billions-to-pay-off-debt/18772/> (accessed 14 March 2016).

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## List of interviewees

Acacia, Economist: Ryan Hawthorne.

Broadband Infraco, Regulatory Affairs and Government Relations Manager: Phatang Nkhereanye.

CellC, Regulatory Affairs: Kerron Edmunson, Graham Mackinnon, Herman Pretorius.

CSIR, Maraka Institute: Kobus Roux.

Department of Telecommunications and Post, (Acting) Director-General: Joe Mjwara.

Fibreco, CEO: Arif Hussein.

Openserve, Chief of Sales and Marketing: Prenesh Padayachee.

Seacom, CEO: Byron Clatterbuck.

Vodacom SA, Chief Officer of Legal, Regulatory and Risk: Nkateko Nyoka.

Western Cape Government — Department of Economic Development and Tourism, Deputy Director-General: Jo-Ann Johnson.

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