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**CASE STUDY: BROADBAND THE CASE OF SOUTH AFRICA**

This case study was prepared for the ITU Workshop on the Regulatory Implications of Broadband by Alison Gillwald, Director, LINK Centre, Graduate School of Public and Development Management, University of the Witwatersrand <Gillwald.A@pdm.wits.ac.za>. “Broadband: The case of South Africa” forms part of a series of telecommunication case studies produced under the New Initiatives Programme of the Secretary-General of the International Telecommunication Union (ITU). The Telecommunication Case Studies Project is being carried out under the direction of Dr Ben A. Petrazzini <Ben.Petrazzini@itu.int>, Telecommunication Policy Adviser in the ITU Strategy and Policy Unit (SPU). Other case studies – including studies on Broadband in Australia, Italy and Malaysia, – may be found at the webpage <<http://www.itu.int/broadband>>. The views expressed in this paper are those of the authors and do not necessarily reflect the opinions of the ITU, its Membership or the Government of South Africa.

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## 1 INTRODUCTION

In the policy formulation context of South Africa, broadband is understood to be the ability to provide a multiplicity of services, whether data, voice or video, at any speed. The speed of the services is likely to be a major determinant of cost. The price, based on the input costs, is likely to determine the demand and therefore the availability of broadband. Therefore, a suite of services should be available at slow and high speeds to meet the diverse needs and means of the population. This broader approach is seen as more appropriate and flexible for a developing country<sup>1</sup>.

The utilisation of broadband and its practical capabilities of bridging the digital divide by providing robust Internet access with cost effective bandwidth has been the subject of much debate in South Africa and around the world. This case study focuses on some of the technical considerations of broadband, its possible modes of implementation and the potential for introducing new value-added services, and its current technical status in South Africa. Following discussion of the above, consideration is given to the policy and regulatory issues that arise for South Africa and that the policy makers will have to ponder.

## 2 SOCIO-POLITICAL AND ECONOMIC BACKGROUND

South Africa is 1'127 square kilometres consisting of nine geographical and political entities or provinces. South Africa's total estimated population stands at 40.5 million.<sup>2</sup> The total population of South Africa accounts for about 5per cent of the total African population estimated to be around 800 million.

The GDP at real constant prices in the fourth quarter of 2000 was South African Rand 873,637 million<sup>3</sup>. The economy is based primarily on mining, agriculture, manufacturing and commerce. The exporting of mined minerals and gold accounts for over 60 per cent of merchandise export value. Private consumption expenditure increased steadily in real terms between 1993 and 1997, with the consumption of transportation and communications services in 1997 accounting for almost 85 per cent of total private expenditure.<sup>4</sup> As service sectors continue to gain significantly within the economy, broadcasting has grown from 0.27 per cent in 1990 to 0.6 per cent of GDP in 1997. In line with international trends, the proportion of this income being made-up from subscriptions as opposed to advertising is on the increase. Telecommunications has grown even more dramatically and at 4 per cent South Africa already spends more on telecommunications as a percentage of GDP than most developed European nations.<sup>5</sup>

Despite being touted as a beacon to the rest of Africa, South Africa faces many challenges around, unemployment, crime, education, delivery of health services, and housing. The country is relatively dependent on foreign investment and gears economic policy largely to that end. The slowing down of the world economy during 1998/1999 impacted negatively on South Africa with growth for 1998 being revised to a mere 0.7 per cent<sup>6</sup>. The upward turn in the economy has resulted in positive domestic growth that was recorded at 3.1 per cent in 2000<sup>7</sup>.

Despite national policies aimed at some levels of economic redistribution and poverty alleviation the country continues to have one of the highest Gini co-efficients in the world. The income gap is vast with household subsistence levels situated at less than US\$ 200/month. The poorest 20 per cent of households (equivalent to 27 per cent of the population), account for less than 3 per cent of total income levels, whilst the richest 20 per cent of households, (equivalent to less than 3 per cent of the population) account for 65per cent of total income production<sup>8</sup>.

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<sup>1</sup> Interview with Director General, Department of Communications, South Africa, 13 February 2001 <<http://www.doc.gov.za/>>

<sup>2</sup> People of South Africa Population Census *Statistics South Africa*, Report No. 1: 03-01-11 (1996) While this report is dated 1996, it was released in 1998 following a post-enumeration survey (PES), <<http://www.statssa.gov.za/>>

<sup>3</sup> SA Reserve Bank Time Series Analysis Sheet 1: GDP at market prices 1990-2000

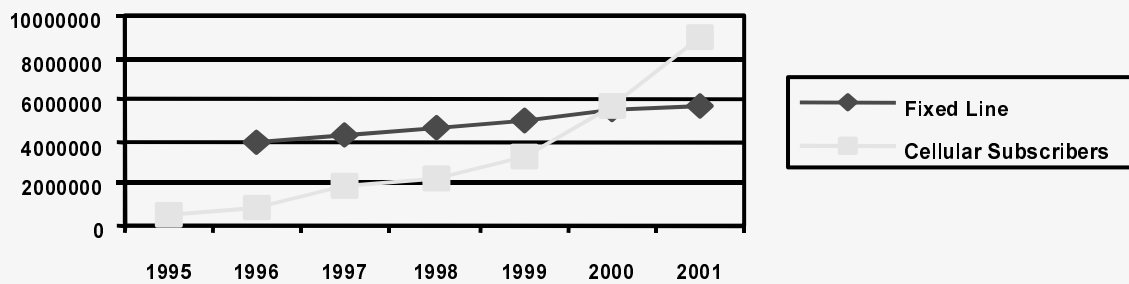
<sup>4</sup> South African Reserve Bank (SARB) Quarterly Bulletin 1998, <<http://www.resbank.co.za/>>

<sup>5</sup> Bain and Company SA: The South African Telecommunications Industry Structure and Regulation: How to destroy Value- Lessons form a global perspective, 5 April 2001, Johannesburg.

<sup>6</sup> SARB: NRI6006z National Accounts Information. GDP at market prices, <<http://www.resbank.co.za/>>

<sup>7</sup> *ibid*

<sup>8</sup> Yankee Group, 1999 < <http://www.yankeegroup.com/>>

**Figure 1: Fixed Line Growth (main lines in millions), Cellular Growth (subscribers in thousands)**

Source: Figures provided by BMI-TechKnowledge, South Africa

Political transformation to a constitutional democracy was effected in April 1994 following the election of the African National Congress into power and the establishment of a Government of National Unity. The second democratic elections took place in June 1999 - providing the African National Congress with an even greater majority than in 1994 - and was accompanied by the former President Nelson Mandela's succession by his deputy, Thabo Mbeki.

### 3 CHARACTERISTICS OF THE SOUTH AFRICAN TELECOMMUNICATIONS LANDSCAPE

#### 3.1 Teledensity

Despite significant gains over the last five years, the distribution of telephony service in South Africa continues to reflect the highly uneven development of the infrastructure of the past - with 18 per cent of black households and 82 per cent of white households having telephony service. Universal access, measured as a 30 minute walk to the nearest phone has increased dramatically with over 80 per cent of all households having access. South Africa has over 100'000 public pay phones distributed nationally. While the positive effect of policies to bridge this gap are beginning to be evident, the differentiation in access and services between rural and urban households remains high - with 64 per cent of urban households and only 9 per cent of rural households.

While great divides exist in the country between the services and accesses to telephony that blacks and whites, as well as between rural and urban dwellers, the real redress of this situation has arisen with the introduction of prepaid mobile cellular services. The number of prepaid subscribers on both national networks has now outstripped the number of contract subscribers. Overall 28 percent of people have fixed telephones and/or cell phone in their house (universal service).

Low teledensity figures are a combined product of the skewed utility distribution policies of apartheid and other barriers to telephone penetration, such as geographical, low literacy levels, high costs of usage and poor last mile infrastructure. In addition to this, line cancellation due to lack of affordability is estimated at 16 per cent. A study commissioned by the telecommunications regulator in 1997 indicated that, at that time over 40 per cent of the population would not even be able to afford the line rental of the incumbent operator, if one used a figure of two percent of income on telephone expenditure which is below the national average of over 3 per cent.<sup>9</sup>

<sup>9</sup> Stavrou and Mkize, Needy People Study, commissioned by the South African Telecommunications Authority (SATRA), Johannesburg, 1997, <<http://satra.gov.za/>>

**Table 1: Universal Service and access figures for South Africa**

Percentage of households with service and access (fixed and cellular combined)		ALL	AFRICAN	WHITE
ALL	Universal service	42	18	82
	Universal access	80	74	93
URBAN	Universal service	64	32	82
	Universal access	94	93	94
NON-URBAN	Universal service	9	5	84
	Universal access	59	56	98

Note: Access measured as 30 minutes walk from a telephone

Source: Peter Benjamin on basis of South African Census October Household Survey 1999. See CommUnity at Projects <<http://link.wits.ac.za>>

### 3.2 The legislative and regulatory environment

Prior to 1996, the South African telecommunications sector was centrally regulated via the Department of Posts and Telecommunications and Telkom - the sole PTO and a state owned entity. Telkom had been incorporated as a public company in 1991 with the state being the sole shareholder. Telkom was both sole licence holder and regulator.

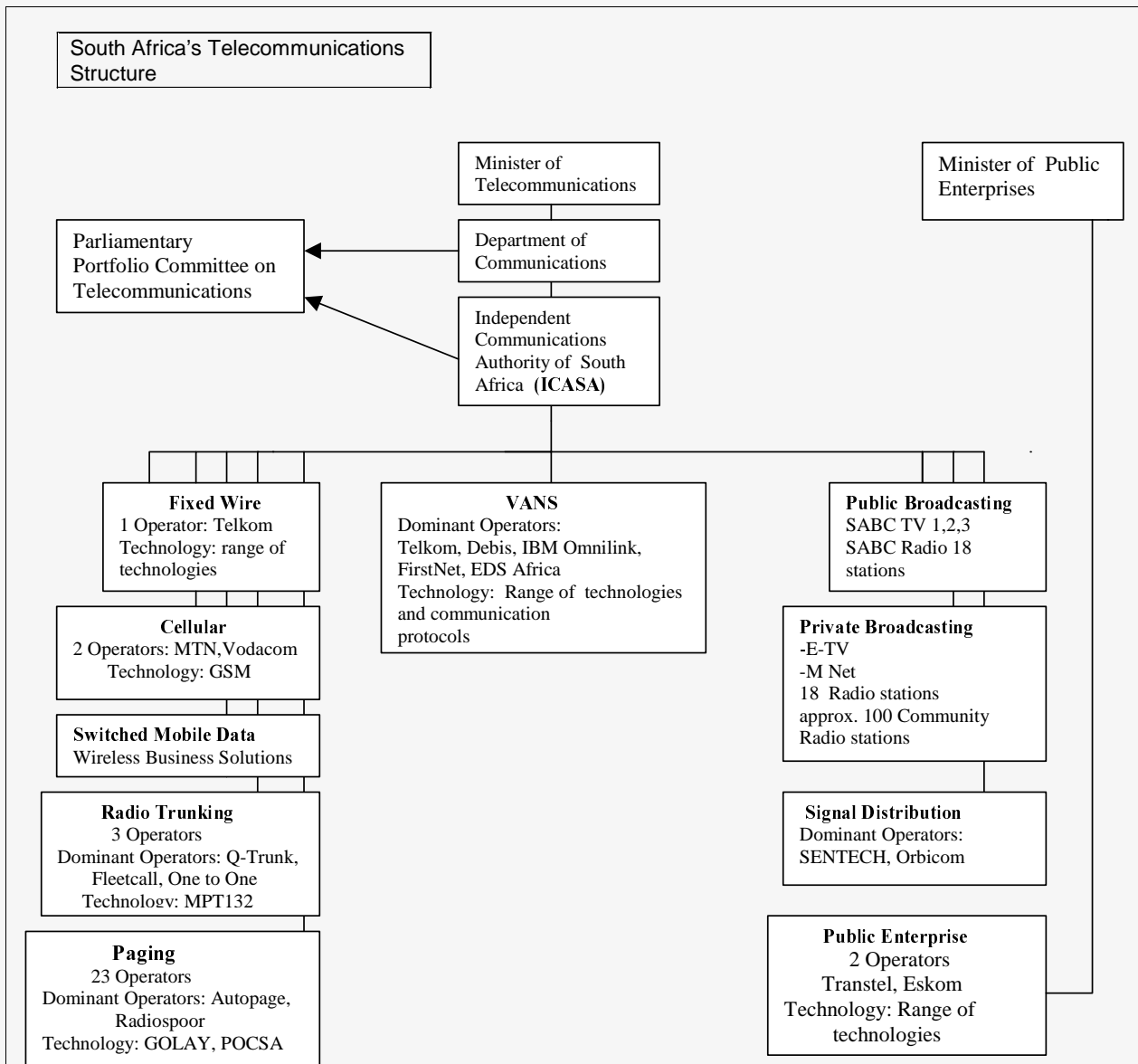
Significantly, prior to the first democratic elections, the Independent Broadcasting Authority (IBA) Act in 1993 created a total break from the past by establishing an independent and impartial regulator to regulate broadcast content and signal distribution. Later, the Telecommunications Act of 1996, established the South African Telecommunications Regulatory Authority (SATRA) which was mandated with regulating telecommunications in the public interest. This established a three-tier separation of policy, regulation and implementation functions within the telecommunications service market. The Ministry of Communications retained various policy-making functions and, importantly, certain licensing functions and a veto on all regulations.

Due to mounting logistical pressures brought about by convergence of technologies and institutional resource restraints, the two regulatory authorities were merged into one. Under the Act of 2000 the Independent Communications Authority of South Africa (ICASA) was established as the sole regulator of the country's broadcasting and telecommunications sectors. ICASA, in implementing the statutory objectives, is guided by the former broadcasting and telecommunications legislation with the new ICASA Act only dealing with the organisational structure of the merged bodies and arising rights and obligations.

ICASA is headed by a Council, with Councillors being appointed by the president following public nomination and parliamentary hearing as to their suitability. ICASA's primary role is set out in the objects of the legislation establishing the IBA and SATRA, which enjoins them to promote a range of economic and social goals including the advancement of disadvantaged persons and communities. Other roles and functions of ICASA are in line with those of international regulators, and include issuing licenses for broadcasting and managing the frequency spectrum for optimal use.

### 3.3 Fixed-line telephony

The 1996 Telecommunications Act affords Telkom a legislated monopoly over public switched telephony. In terms of the Act and its PSTN licence, Telkom has an exclusive right to provide national, international and local telephony services, including public pay phones, for a period of five years to expire in May 2002, when the sector will be open to new entrants. During the exclusivity period, Telkom is required to install 2.8 million new lines, including 120'000 payphones. About 1.7 million lines are to be installed in under-served areas. Telkom's monopoly also extends to the supply of all infrastructure for value-added networks, and to cellular networks. Telkom also holds a VANS and radio licence and has shares in three satellites namely, Intelsat, Inmarsat and ICO.

**Figure 2: South Africa's Telecommunications Structure.**

Source: BMI-TECH Knowledge 2000, LINK Centre 2000

Over the next 3 years, Telkom plans to spend US\$10.4 billion to install new lines and to digitise 1.27 million analogue lines. Overall digitalisation, of the switched network sits at 74 per cent with full digitalisation of the transmission network. Multimedia applications will be supported by extending the coverage of narrowband ISDN (Integrated Services Digital Network) and by introducing broadband ISDN services (see below). This innovation is possible because the core backbone of the ATM network has been fully operational since February 1999, linking Johannesburg, Durban, Bloemfontein, Port Elizabeth and Cape Town.<sup>10</sup>

As part of sector reform, Telkom took on a strategic equity partner (SEP) in April 1997 to assist in settling a high debt/equity ratio and preparing the company for competition. The capital raised from the R5.6 billion sale price was further needed in order to effect fixed line rollout. Thintana Communications, a consortium comprised of SBC Communications International Inc and Telekom Malaysia Berhad acquired a 30 per cent equity stake in Telkom, holding 18 per cent and 12 per cent respectively. During FY2000 Telkom's total assets were estimated at R35 billion with annual turnover in excess of R26 billion. Attributable profits were

<sup>10</sup> *Communication Handbook 2000*, BMI TechKnowledge, Johannesburg, <<http://www.bmi-t.co.za/>>

R1'850 million, a 21.1 per cent increase from the previous year, while its debt-equity ratio stood at 1.3<sup>11</sup>. Plans to sell a further 20 per cent of Telkom have been announced, and an IPO and bourse listings of the company are expected before the end of the third quarter of 2001.

### 3.4 Wireless market

GSM has changed the face of telecommunications in South Africa, and the country is becoming one of the most important GSM markets outside Europe. Italy, the world's largest GSM market has about 22 million users, while South Africa has 8.9 million users<sup>12</sup>. In 1993, two GSM public land mobile network (PLMN) licenses were issued to Mobile Telephone Networks (Pty) Ltd (MTN) and Vodacom (Pty) Ltd to provide cellular telephony on a national basis. Both networks operate at 900 MHz covering most urban areas and national roads — more than 70 per cent of population.

Cellular subscriber growth has far outgrown the initial expectations, and the industry continues to grow, attracting 1.9 million subscribers by March 1998, which represented 4 per cent of the population. At the end of 1999, cellular subscribers were estimated to be more 3.2 million — 7 per cent of the population<sup>13</sup>. A major chunk of this figure comes from the prepaid market, which grew in 1998 alone by 161 per cent. This growth is attributed to factors including the convenience of the prepaid model and the difficulty in securing credit for contracts.<sup>14</sup>

The cellular sector in South Africa boasts a comfortable pre-tax income base of more than R2 billion, with Vodacom recently having invested R300 million to back up its new Internet company, Yebonet. Revenue per cell phone is estimated at R275 per month and the value of cell phones is estimated at over R520 million. Estimates are that the overall current market value is R7 - 8 billion with combined revenue for MTN and Vodacom of some R9.82 billion for financial year 1999<sup>15</sup>. Market forecasts growth to R15 billion by 2004, with as many as 5 – 6 million subscribers. These forecast figures are at variance with those provided by BMI-TechKnowledge.

### 3.5 Value added network services (VANS)

Under the 1996 regulatory framework, the VANS and equipment supply sectors are fully competitive<sup>16</sup>. ICASA has not finalized the licensing framework for either VANS or PTNs, but interim licences are currently granted on application. Providers however are constrained by the legislative requirement to use Telkom facilities in the provision of VANS. There are currently about 60 issued VANS licenses (both deemed and interim) with total revenue generated in this sector is estimated at R180 - 200 million. Collectively, they service a customer base of 12 000, with monthly income per customer ranging from R2000 to well over R1 million. The total estimated value of installed VANS equipment is between R50-60 million.

### 3.6 Private telecommunications networks (PTN)

There are currently seven interim PTN licenses in the sector, issued after the 1996 Act, in addition to the two national private networks operated by Transtel and Eskom. PTN licenses allow both voice and data services. However, the condition for issue is that the services allowed will be used by companies for internal purposes only, and will not bypass the PSTN. Collectively, Transtel and Eskom operate 150 exchanges, handling 72 million outgoing calls per annum. All other PTNs have to use Telkom facilities where the network is not contained on a single or two contiguous pieces of land, or where it interconnects to the PSTN.

### 3.7 Satellite

Satellite services operate in both the broadcasting and the telecommunications markets. Significantly, no regulatory policy exists on satellite, and the Ministry of Posts, Telecommunications and Broadcasting has only released a draft policy on GMPCS.

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<sup>11</sup> Telkom Annual Report 2000,

<sup>12</sup> Mobile Office Online October 99, <<http://www.mobileoffice.co.za/>>

<sup>13</sup> *Communication Handbook 2000*, BMI TechKnowledge, Johannesburg, <<http://www.bmi-t.co.za/>>

<sup>14</sup> *Development Research Africa, 1999*, <[http://link.wits.ac.za/news/v3\\_3.html](http://link.wits.ac.za/news/v3_3.html)>

<sup>15</sup> *ibid.*

<sup>16</sup> The Telecommunications Act does not define VANS services, but the Telkom license lists VANS as including, but not limited to: Electronic Data Interchange (EDI), protocol conversion, e-mail and access to a data base or managed data network service. The top three VANS operators have a collective market share of 75%.



Within the broadcasting market, the dominant signal distributors are Orbicom (part of the M-Cell group) and Sentech, the government-owned common carrier signal distributor. GMPCS operator Iridium ran a test licence in the country during 1998, but its international financial difficulties and a South African lacuna in policy stopped operations. Globalstar's US\$ 3 billion system, yet to be launched locally, was expected to begin operations in South Africa by October 2000, and numerous Globalstar village phones were expected in Southern Africa's more remote areas<sup>17</sup>. Other players in this market include PanAmSat which provides services to DTH broadcaster Multichoice, the South African Broadcasting Corporation and a VSAT communications service to Transtel.

Telkom has no competition in the PSTN market. In 1996 there were a total of 45'000 – 50'000 analogue receivers and 35 000 digital receivers in this sector with average monthly revenues of R80 - R150 and R175 respectively. The total annual revenue earned in 1996 for both analogue and digital receivers was in the region of R9.7 – 13.6 million. The total value of equipment installed including uplinks, receivers and satellites is in the region of R500 million.

Inmarsat currently operates a global satellite system that is used by Telkom to offer a range of communications services for customers. Furthermore, Telkom utilizes the services of Intelsat satellites to provide voice satellite links for provisioning of PSTN voice and data services. Telkom itself is building new satellite earth stations to provide symmetrical as well as asymmetrical bandwidth. New teleports providing high-speed reliable connectivity are situated in the three main business areas of the country.

### 3.8 Undersea cable

Significant changes are on the horizon for the South African market as greater intra-continental and global connectivity are expected in Africa. SAT2, the biggest submarine cable serving Sub-Saharan Africa since 1993, will be complemented. SAFE (Southern Africa Far East) will connect Cape Town to Penang, Malaysia through an undersea (submarine) cable system. The WASC/SAT3 cable will connect Dakar, Senegal to Cape Town, while also connecting Cape Town to Portugal and Spain. The Africa ONE network, a 32'000 km undersea fibre optic telecommunication cable system, will ring the entire continent and have 20 - 30 landing points at key coastal cities in Africa (Cape Town being one), the Middle East and Europe, and will be ready for service in 2002. This greater connectivity will go a long way to bridging the digital divide between Africa and the rest of the world, and increasing South Africa's importance as a hub.

### 3.9 Internet market

South Africa is ranked 20<sup>th</sup> in the world by Internet nodes.<sup>18</sup> By the end of 1998, the number of South African ISPs had swollen from an initial 7 in 1994 to 120 with 1'040'000 subscribers/users. By the year 2000, there were 150 ISPs and a growing number of virtual ISPs that had over 1.8 million subscribers/users among them.<sup>19</sup> Its Internet industry can be divided into three categories: dial-up users accessing the Internet via modems, corporate users gaining access through company networks, and academic users and educational institutions (see Annex 1).

The domestic Internet market consists of about 10 "top-level" operators each with their own leased line Internet links, as well as a number of "second level" ISPs who share the international bandwidth of the top-level operators. Most of the links are carried through the SAT-2 fibre cable across the Atlantic to the US, but there are also satellite providers. Most ISPs peer through the South African Internet Exchange (SAIX). Collectively including 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> tiers, there are currently around 150 ISPs in the country. Between them they boast 55 points-of-presence around the country with two shared INX's. The market remains dominated by The Internet Solution (IS), UUNet Internet Africa (UIA) with its parent DataTec, and Global Internet Access (GIA) with its parent USKO, in that order.

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<sup>17</sup> *Communication Handbook 2000*, BMI TechKnowledge, Johannesburg, <<http://www.bmi-t.co.za/>>

<sup>18</sup> *Communication Handbook 2000*, BMI TechKnowledge, Johannesburg, <<http://www.bmi-t.co.za/>>

<sup>19</sup> AISI-Connect National ICT Profile SOUTH AFRICA (ZA); Bellanet South Africa Report: Internet connectivity.

### 3.10 Broadcasting

#### 3.10.1 Radio

The South African Broadcasting Corporation (SABC) operates 19 radio stations reaching a combined average daily adult audience of about 14 million.<sup>20</sup> Its public service radio portfolio includes stations covering the 11 official languages and some minority cultural groups. It operates two national commercial stations, Radio 5 and Radio Metro. It also offers an external radio service in four languages: English, French, Portuguese and kiSwahili.

In addition there are 15 private radio stations, controlled by a variety of players and with a total listener-ship across all radio stations of around 20 million (see Annex). There is also a vibrant community radio sector in South Africa, with over 80 stations licensed on a temporary basis. The ICASA is in the process of licensing 235 applicants for four-year community licences.

#### 3.10.2 Free-to-air television

The free-to-air market has recently been opened up for limited competition. However, the public broadcaster, the SABC, continues to dominate television broadcasting with its three channels, commanding over 12 million viewers daily. It operates three full-spectrum channels, SABC1, SABC 2 and SABC 3. SABC 1 is broadcast predominantly in Zulu, Xhosa and English, while, SABC 2 is predominantly Sesotho, Afrikaans and English. SABC 3, which has the smallest but most lucrative audience share from an advertising point of view, is almost exclusively broadcast in English. Simul-casting is available on SABC1 and 2 permitting simultaneous transmission of dubbed material on television with the original soundtrack on radio. This allows viewers to watch, for example, a popular American show on SABC 1 in Zulu while those wishing to do so can tune in to the original sound-track on radio.

The public broadcaster is highly commercialised with around 78 per cent of its operating revenue derived from advertising and sponsorships and only 16 per cent from television licences.<sup>21</sup> In the year ending March 1999, its revenue totalled over R2 billion, with a net surplus of R112 million.<sup>22</sup>

The national television service, e-TV, which was granted a licence in 1998, is the only free-to-air competitor to the SABC. It currently has an audience share of less than 5 per cent and has yet to release any formal revenue figures. The station is still struggling to find its feet with large amounts of money currently being invested to ensure its long-term viability. Its foreign partner, Times Warner, provides access to popular programming. The prevailing regulatory regime sets onerous requirements to meet public service obligations, including a full news service in a range of languages and a range of local content programming. This will have a major impact on e-TV's fortunes. e-TV operates largely on UHF bands rather than the preferred VHF bands which have largely been monopolised by the SABC and the subscription terrestrial service, M-Net.

#### 3.10.3 Signal Distribution

The signal distribution market is dominated by the national common carrier, Sentech, which provides terrestrial and satellite services to all the major broadcasters, excluding M-Net and DStv, who only draw partially on the extensive terrestrial network. Begun as a private subsidiary of the SABC, Sentech became a public company in 1996 with the State as the sole shareholder. Legislation is currently being amended to permit Sentech's partial privatisation through the incorporation of a strategic equity partner<sup>23</sup>.

MIH is the dominant satellite signal distributor primarily through provision of signal distribution and encryption services to its affiliated companies M-Net and DStv. Satellite transponder capacity and availability is increasing in South Africa, with several launches of the latest generation satellite planned over the next five years.

Optical fibre is regarded as the optimum technology for interactivity with its ability to deliver a variety of high quality audiovisual services on demand. The mix of optical fibre and coaxial cable that make up

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<sup>20</sup> <<http://www.sabc.co.za/profile.html>>

<sup>21</sup> Main AMPS 1998

<sup>22</sup> SABC Annual Report 1998-1999

<sup>23</sup> Publication of tenders was expected in the first half of 2000. Sentech has recently attempted to assert itself more strategically in the digital satellite market with the introduction of proprietary IRD technology, marketed as Vivid.

Telkom's infrastructure has the ability to deliver analogue and digital broadcast signals. The end the monopoly by Telkom in 2002, may well usher in the opening of the broadcasting market to cable provision.

## **4 INTERNATIONAL AND REGIONAL POLICY STRUCTURES AFFECTING SOUTH AFRICA'S TELECOMMUNICATIONS MARKET**

### **4.1 Southern Africa region**

South Africa is a member of the Southern African Development Community (SADC). The SADC's primary focus is the regional integration of the politics and economies of its 14 Southern African member states. The SADC's competence in telecommunications is housed in a Ministerial Committee, the Southern Africa Transport and Communications - Technical Unit (SATCC-TU). This unit developed the SADC Protocol on Transport, Communications and Meteorology, which was adopted in March 1998. The agreement requires South Africa and other regional states to harmonise their telecommunications regulatory environments, and to create similar technical standards, network maintenance and provision, performance standards, regulatory structures and universal service policies, among other objectives<sup>24</sup>. Increasingly South Africa will have to consult and have regard to developments within the SADC when making decisions regarding its own telecommunications market. For example, the Telecommunications Regulators Association of Southern Africa (TRASA), an SADC association has been created to harmonise the region's regulatory approaches. Further evidence of this future scenario is the recent production of a Model Telecommunication Policy and Bill by the SATCC, a model that all SADC members' telecommunications legislation is follow substantively, if not precisely in structure.

### **4.2 African region**

The African Telecommunications Union (ATU), of which South Africa is a member, Is the significant continental body with a bearing on South Africa's telecommunications sector. ATU membership does not require compliance with specific objectives. Rather, the ATU enjoins South Africa to participate in the vision of the Union, being a working partnership between the ICT industry and African governments. The objectives of the ATU are numerous. They include the promotion of funding and finance, developing appropriate policy and regulatory frameworks, promoting ICT human resources development<sup>25</sup>. These objectives are to be achieved through ATU organs, for example the Administrative Council, the General Secretariat and the Conference on Plenipotentiaries<sup>26</sup>. The focus at the ATU is on *capacity building* in various strategic areas, such as policy and human resources rather than on implementation. South Africa's continental obligations in the ATU, then, are more administrative in nature than procedural.

### **4.3 The world trade organisation (WTO)**

South Africa is a member of the World Trade Organization, WTO. WTO membership binds South Africa to an open trade system with requirements to adhere to specific principles when trading with WTO member states. These principles are: freer trade through tariff reduction, non-discrimination against foreign players, market liberalization, increased competition and policy transparency.

Specific commitments affecting South Africa's telecommunications sector are contained in the General Agreement on Trade Services (GATS) Annex 1 of the Agreement establishing the WTO. It is important to note that Annex 1B does not apply to measures affecting the cable or broadcast distribution of radio or television programming. South Africa's WTO commitments under GATS can be generally understood as requiring a totally liberalized domestic telecommunications market, as per WTO principles. These commitments require among others: ensuring access to and use of public telecommunications transport networks or services offered within or across the borders of South Africa (including private leased circuits) by WTO members<sup>27</sup>; ensuring that relevant information on conditions affecting access to and use of public telecommunications transport networks and services (including tariffs and other terms and conditions of service) is publicly available; providing information on specifications of technical interfaces with such

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<sup>24</sup> SADC Protocol on Transport, Communications and Meteorology. Article 10.2-10.11

<sup>25</sup> African Telecommunications Union.(ATU) Mission statement, chapter on objectives.

<sup>26</sup> *ibid.* section 6

<sup>27</sup> Section 4. WTO: Final Agreement. General Agreement on Trade in Services. (GATS) Annex 1B Part 6. Annex on Telecommunications

networks and services<sup>28</sup>; and affording access on reasonable and non-discriminatory terms and conditions of use. The only WTO restrictions on market players will be placed to protect the integrity of South Africa's networks, maintenance of state security, secrecy, or to frustrate efforts to circumvent WTO agreements<sup>29</sup>.

Article II of GATS Annex 1 provides for exemptions from these provisions. The exemptions granted South Africa under the article are consistent with Telkom's licence conditions. This has the effect of suspending South Africa's compliance with WTO mandated commitments until the end of Telkom's monopoly in May 2002.

## 5 FUTURE DEVELOPMENTS

### 5.1 Digital broadcasting advisory body

The South African government has committed itself to preparing for the move to digital terrestrial television and radio broadcasting. This opportunity to leapfrog stages that other countries requires a massive commitment and, at around US\$ 200 million for major sites, a major cost. Digital Audio Broadcasting spectrum has already been set aside and is expected eventually to replace FM and AM broadcasting and to supplement short-wave.

### 5.2 New policy directives

In late March 2001 the South African Cabinet approved a number of policy proposals in relation to the telecommunications policy in the country which reflect the intentions of government and which are currently open for comment in South Africa until 2 May 2001. The decisions followed a national colloquium of stakeholders and interested parties in February.

The proposed policy decisions identify a number of touchstones; priority issues that will attract substantial focus in the new telecommunications policy. These have as their foci:

- black economic empowerment;
- domestic and foreign direct investment;
- stable predictable regulation;
- universal service and access;
- human resource development; and
- a reduced digital divide.

Alongside these highlights is the familiar general commitment by the South African government to development and economic growth.

A summary and itemised consideration of the policy directives, is instructive to evaluating the impact and possible implications of the purported policy stance of the government with regards to telecommunications.

#### 5.2.1 Second National Operator

The government will invite applications for Public Switched Telecommunications Service (PSTS) licence to become the second national carrier in July 2001. The PSTS includes VANS and long-distance service provided that it will be in the form of fixed-mobile services. Provision is made for the carrier to use Telkom facilities until May 2005. The second licence will be granted subject to universal service and access obligations. Provision is made for black empowerment ownership of 30 per cent in all new licences. Importantly, ESI-TEL (the new communication company of the electricity utility, Eskom) and Transtel are mandated inclusions in any new licensed operator, whilst foreign share holding in this new operator will be restricted to 49 per cent.

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<sup>28</sup> *ibid* Section 5

<sup>29</sup> *ibid* . General Agreement on Trade in Services. (GATS) Annex 1B Part 6. Annex on Telecommunications

### 5.2.2 Value Added Network Services (VANS)

VANS operators will still be prohibited from carry voice services including Voice over the Internet, subject to a number of tight exceptions, and on pain of licence revocation. VANS operators shall have the right to provide full spectrum end-to-end e-commerce services.

### 5.2.3 Third Generation (3G) and 1800 MHz Radio Frequency Spectrum

Mobile operators Cell-C, MTN and Vodacom will be all be granted 1800 MHz frequency spectrum as will the current PSTN incumbent Telkom and the SNO. In addition, these same parties shall be issued third generation service licences.

### 5.2.4 Universal Service and Access: reduction of the Digital Divide

Targets for universal service that have been stipulated in licenses are to be re-defined and will in future address the need for access to advanced internet services such as multi-media. Disabilities and the equitable geographic spread of services will be considered. The monitoring of compliance with universal service obligations will be made more efficient by the increase of institutional capacity at the Universal Service Agency (USA), which is to be restructured. Universal Service will also be aided by non-fee domain registration for public schools and a mandatory 50 per cent discount on all Internet access calls made by the latter.

### 5.2.5 Economic Empowerment of Historically Disadvantaged

All new major telecommunications licenses will set aside up to 30 per cent of shareholding for persons from previously disadvantaged groups. Regulations on social obligations to previously disadvantaged groups in the ICT sector shall be developed by ICASA with regards to service providers, equipment suppliers and vendors. These obligations are to be included in the licenses themselves.

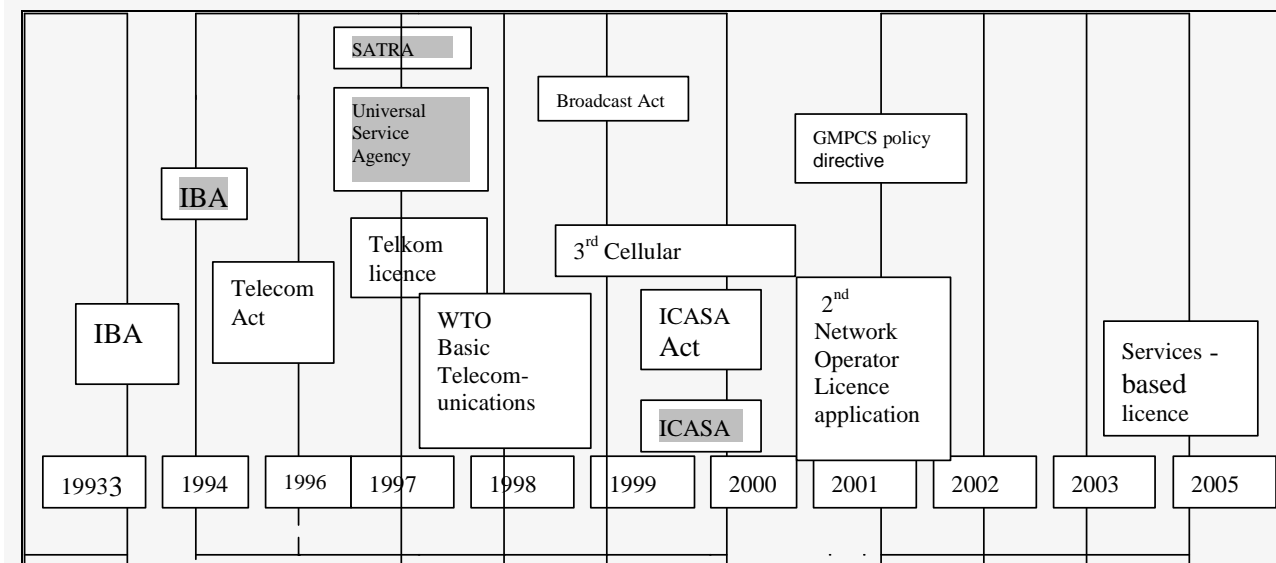
### 5.2.6 Numbering, Public Emergency Communications and Directory Services

The number allocation system adopted is expected to ensure neutrality. The Independent Communications Authority of South Africa (ICASA) shall administer the functions of number allocation, including development of a costs-of-allocation model, maintenance and management of routing database systems. A central database is to be developed and maintained in future by ICASA. Public Emergency Communications Centres (PECCs) are to be established, and the single public emergency number is to be 112. These PECCs are expected to have voice, global positioning systems (GPS) and data capability. A single consolidated directory for all telecommunication is to be made available to every fixed line subscriber. Furthermore, a national directory information database is to be established and maintained by an operator assigned by ICASA; pre-paid numbers are to be included in this database. Directory services are to be available throughout the country and provision must be made thereto *gratis* from public pay phones.

### 5.2.7 Implications of the adopted telecommunications policy direction

Stakeholder responses to these recent announcements are mixed and will not be fully known until the end of the response period in early May. Early indications are that while empowerment groupings have welcomed the quotas stated for ownership of new operators, other industry sectors hoping for increased services based competition remain disappointed, especially over the continued restrictions on VOIP. Concerns have also been expressed about the commitment to a duopoly structure for the public switch national networks in the light of failures of duopolies else where in the world in terms of extending services and reducing costs to users and consumers. Concerns have also been expressed around the required inclusion of state enterprises in the competitive licences and in their resultant dominance in the extended licences in the mobile segment of the market. It has been argued that while these enterprises should not have been excluded their inclusion should have been left to commercial negotiation to determine their real value.

**Figure 3: Timeline of the key events in South Africa's telecommunications sector**



Source: Case Study author

## 6 BROADBAND: A TECHNICAL PERSPECTIVE ON CURRENT STATUS AND OPTIONS AND CHOICES DOWN THE LINE

Broadband networks can be understood in a number of ways. Technically they can be described as networks with "advanced telecommunications capability"<sup>30</sup>. However, many of the respondents interviewed in South Africa for the purposes of this case study, described them more in terms of underlying principles. A technical definition based on speed, or the shift from circuit-switching to packet-switching, is regarded by some persons interviewed for the purposes of this study as too narrow. Some respondents described broadband as "twice the capacity of what exists today". Other respondents focused on the convergence of fixed and mobile technologies in a broadband environment. Many equated broadband with IP-based infrastructure that would avoid the problems of working with layers of network, instead working through a single network with control functions to manage it. Other respondents described the broadband scenario as allowing for the incorporation of different technologies carrying data from any platform - a multi-lane highway with traffic moving at any speed with transparent use of infrastructure.

### 6.1 Current status

Broadband has been on the South African telecommunications agenda since it was identified as a vacuum in the policy framework that culminated in the 1997 Telecommunications Act. But it is only with increasing demands from bandwidth-strapped users and service providers that it has become a public issue. The strategic objectives of broadband networks in South Africa are the subject of a new policy process currently underway which should be finalised by mid-2001. Of particular interest in the policy process will be the consideration given to broadband technologies that favour the developing country environment. These were not specifically mentioned in the recently cabinet approved policy directions.

In South Africa, its current implementation is limited with broadband applications on fibre-based technology being predominant. The only existing fixed broadband infrastructure in South Africa consists of the fibre optic backbone of the national telecommunications network operated by the monopoly incumbent, Telkom. However, other parastatals such as Transnet and Eskom have installed fibre across the electric grid and rail network in South Africa. Telkom intends to extend this broadband network through regional and primary access rings (PAN/SAN).

<sup>30</sup> The US Telecommunication Act of 1996, in Section 706(c)(1), defines "advance telecommunications capability" as the "high-speed [meaning upload and download speeds of over 200mbps], switched, broadband telecommunications facility that enables users to originate and receive high-quality voice, data, graphics and video telecommunications using any technology."

ADSL is being piloted on the copper based access networks owned by Telkom. Initial tests of ADSL with planned rollout in the next 12 to 18 months are being mooted. In the metropolitan and campus environments it is envisaged that other copper based DSL technologies such as SDSL and VDSL will be implemented. However, no concrete plans are available for DSL deployment. It is also unclear whether the incumbent and, when deregulation takes place in 2002, the new national operator will foster the technology or opt for emerging technology alternatives.

In the broadcasting terrain, broadband capability exists in the satellite network of the digital Direct-to-Home subscription broadcaster, Multichoice. With its partners, it has been piloting high bandwidth Internet access for around 12 months, with rollout progressing slowly. Tests are also underway on Digital Audio Broadcasting (DAB) and the feasibility of Digital Terrestrial Television is also being examined. The Minister of Communications recently appointed a statutory Advisory Committee on Digital Broadcasting, in terms of the Broadcasting Act of 1999, to advise the Government on issues relevant to the introduction of digital broadcasting. It is necessary to determine the actions Government needs to take to become a global leader and to maintain competitiveness, quality and quantity in the digital environment.

## **6.2 DSL dilemma for South Africa**

The incumbent telco, Telkom, is piloting a DSL broadband service. However, certain problems persist in the South African market that could delay the implementation of DSL broadband. Firstly, the capital outlay for the equipment such as DSLAMs is costly and with a monopoly presence it would have to be deemed a priority in terms of governing capex costs. Meanwhile, existing investments in technology such as ISDN have not been fully recovered by the monopoly. The high cost of ISDN has resulted in a slow take up that has been restricted almost exclusively to the business sector.

Secondly, due to rapid advances in technology, DSL could be pre-empted by an alternative technology such as wireless or digital television.

Thirdly, in urban centres where DSL is likely to be used in the initial stages, the copper infrastructure is fairly old. Replacing or reconditioning the copper infrastructure at current prices may not be feasible. Moreover, the high rate of copper theft in South Africa is already compelling Telkom to replace part of the old copper infrastructure but at considerable cost and in a reactive rather than in a planned way.

Another likely constraint is that the monopoly receives a fair amount of its income from domestic, national and international call tariffs. The online nature of DSL will certainly have an adverse effect on revenues and may therefore discourage DSL implementation. The cost of the local loop provision could be increased substantially by the telco with a view to offsetting loss of revenues from voice generated calls, thus negating the spread of DSL and its potential large-scale use.

The leased data line services also account for a large proportion of income for the local telco. As in the voice income stream, the telco will lose substantial revenue for data services as DSL will allow for direct PPP and VPN services, which have traditionally been fulfilled by leased data circuit access. The monopoly in the current environment, or the competitive player or players in a liberalised environment, may curtail DSL use or apply high value cost structures to DSL to ensure viable income streams.

With regard to the Internet, services in South Africa are provided largely by Internet Services Providers. Currently the law precludes the ISP's from carrying voice traffic. Hence it is unlikely in the current scenario that ISP's will market DSL services to customers, unless there is relaxation of current policies. Bandwidth relief on the Internet is also subject to high bandwidth trunks into the Internet, and it is not clear whether the current monopoly, Telkom, will be able to supply the new links and cover the potential increase in bandwidth requirements for 'online' DSL connectivity.

With the liberalisation of the market, it is possible that a new operator will offer the DSL services. However, the current cost of new copper infrastructure installation, the spiraling costs of single mode fibre, the proliferation of wireless services, the projected time and capital/labour intensive spans of installing the new service, unbundling the local loop options and back end infrastructure expansion, may result in high cost to user for DSL services.

In South Africa, if the monopoly and current ISP's were to deploy the DSL service, addressing may not represent a major hurdle. However, with liberalisation and competition, the introduction of IP v.6 will be crucial to ensuring DSL success. As many new entrepreneurs and suppliers come on stream, online Internet-ready applications will demand valid addressing connectivity to the Internet, especially if real time VOIP

end-to-end sessions between users and workgroups become a reality. Access infrastructure upgrades to PC's, networking infrastructure to both the user and the telco's will definitely take time and could prove to be cost prohibitive in the short to medium term.

The choices to be made and options taken will be highly dependent on the policy and regulatory environment in relation to competition and e-commerce, which is currently being determined.

### **6.3 Broadband wireless**

The South African market has one of the most rapid take-ups of mobile cellular telephony in the world and within six years had achieved a subscriber base of over seven million between the two operators. The opportunities for mass Internet access via this medium is a reality. As a single mobile phone with WAP/WIP capability has the potential to allow the mass user base instant connectivity, as opposed to the high start up cost of access for traditional terrestrial services, there exists the possibility that, with the rapid adoption of mobile telephony and the subsidization of handsets by service operators, this type of Internet communication with higher bandwidth capability will be readily adopted rather than traditional broadband.

### **6.4 DSL vs ISDN vs Satellite vs Wireless vs Digital terrestrial in the access network in South Africa**

ISDN attachment devices to allow for PC connectivity have only recently started to fall in price, but are far from becoming as ubiquitous as modems or network interface cards are in South Africa. As costs fall, users are able to experience higher quality Internet connectivity. In recent months, falling prices have stimulated demand for ISDN (BRI) connections, but within a very limited range of customers due to its high operational cost over a length of time. Government's view is that the economics of DSL will have to change, or it will be as prohibitive as ISDN has been and remain at the level of corporate use only.

Satellite Internet connectivity has been on the increase in South Africa over the last months, being adopted primarily by privately owned digital satellite TV users. The technology has been marketed to this closed group of users who enjoy the new infrastructure at a nominal increase in their monthly subscriptions. The bandwidth increase on the downlink is substantial as compared with traditional land based copper attached V90 modem specifications, however with limitations on the uplink.

Again, the traditional market for DTH TV in South Africa is the very top end of the market, due to the high start-up costs.

The dilemma will be whether to introduce DSL technology, and at what cost, or whether to continue flagging ISDN as the de facto choice for matching increased user bandwidth demands. If DSL is introduced by the local telco, it will certainly be at a higher cost with a view to recover investment costs of both ISDN and DSL infrastructure. ISDN would only be used in certain applications, as DSL would be the choice of most users. The monopoly as the entity controlling the local loop will be able to manage this process quite comfortably as the DSL Access Multiplexer would be based at their local switching centers, and the DSL modem user would have to access via this mode of connectivity.

With the opening up of competition in the local loop with the introduction of the second network operator, a different costing model will develop. The current restrictions of point-to-point communication for telecommunications limit the possibilities for high-speed broadband access in South Africa, while the fusion of mobile access options into seamless connectivity provides new opportunities in applications and access to services.

What is also evident is that while convergence will permit the use of a single platform to deliver traditionally distinct services, each platform will continue to have benefits for specific services over other platforms, depending on the needs of the consumer. Perhaps because of this, in the South African context, operators and broadcasters are still thinking more about providing "traditional" infrastructure more effectively and cheaply, rather than offering a range of truly converged services over their digital platform.



## 7 BROADBAND: LEGAL REVIEW AND REGULATORY CONSIDERATIONS

### 7.1 Introductory comments

As law and regulation tend to lag behind technology development and innovation, it is no surprise that a regulatory classification of broadband networks has yet to be developed in South Africa. The recently organised broadband policy process will have some interesting questions to address.

Current South African legislation concerning broadcasting and telecommunications, including the Telecommunications Act No. 103 of 1996 (hereinafter the "Telecom Act"), the Independent Broadcasting Authority Act No. 153 of 1993 (hereinafter the "IBA Act"), and the Broadcasting Act No. 4 of 1999 (hereinafter the "Broadcasting Act"), are largely silent on the issue of broadband technology and networks per se.

The Broadcasting Act, however, specifically tries to deal with multimedia and satellite broadcasting and signal distribution. Also silent on this issue are the various policy directives issued by the Minister of Posts, Telecommunications and Broadcasting, with the notable exception of the Policy Direction On Global Mobile Personal Communications By Satellite (hereinafter the "GMPCS Directive") issued in December 1998. In that document the word "broadband" is mentioned once, but is not defined anywhere in the GMPCS Directive. GMPCS nevertheless clearly fits some of the broadly understood criteria of a broadband service and these regulations can therefore be regarded as South Africa's early attempts to pioneer broadband policy.

### 7.2 Real world context to regulation

As a revolutionary intervention in the telecommunications field, high-speed broadband technologies provide a radical opportunity to develop and advance South Africa's communications infrastructure. Furthermore, the efficiencies associated with digital compression techniques will free up spectrum and place the government in a better position to achieve its social development goals using telecommunications. As with all new applications, broadband introduces opportunities for new market entrants, new products and enhanced competition. This scenario, if properly managed, presents possibilities that can only benefit South African customers.

New broadband technology introducing the fluidity of roles has implications for, and will test the administrative and legislative capacity of the South African government as it considers any reactive policy stance. Invariably, the South African government will be forced to consider whether it has a telecommunications policy that adequately regulates the drastically altered terrain that it now confronts. It is to this challenge that this legal review addresses itself.

### 7.3 Substantive law

As far as South African law, the telecommunications sector and incoming broadband technologies are concerned, there exists a set of specific pieces of legislation that are pertinent, namely:

- The Independent Broadcasting Authority Act, No 153 of 1993 (The "IBA" Act);
- The Telecommunications Act, No 103 of 1996 (The "Telecomms" Act);
- The Broadcasting Act, No 4 of 1999;
- The Independent Communications Authority of South Africa Act, No 13 of 2000 (The "ICASA" Act)<sup>31</sup>;
- The Competition Act, No 89 of 1998.

A critical consideration of the South African telecommunications industry is that an independent regulator oversees the industry in all its aspects. Act 13 of 2000 establishes the Independent Communications Authority of South Africa, or ICASA. ICASA is the supreme regulatory body in South Africa as regards the telecommunications industry and spectrum issues. Its duties include the following: to ensure that market players comply with accepted technical standards, to ensure efficient use of radio frequency spectrum and to

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<sup>31</sup> The 1993 Act establishing the Independent Broadcasting Authority (the IBA) and the chapter in the 1996 Telecomms Act establishing the South African Telecommunications Regulatory Authority (SATRA) have been superseded by the ICASA Act. However the ICASA Act retains the regulatory objectives set out for SATRA and the IBA.

promote SMMEs in the telecommunications industry. The body also ascribes to a host of public interest objectives including attainment of universal service, protection of consumers and the promotion of ownership in the telecommunications industry by previously disadvantaged persons. ICASA acts through a council consisting of seven councillors appointed by the president on recommendation of the National Assembly. This process is in line with the regulatory objective envisaged by ICASA of impartiality in its activities. It is ICASA that will directly influence the structure of any emerging Broadband market as it implements the national Ministry of Communications policy. To retain its impartial stance as regards regulation, councillors are elected to serve for 4 years and numerous provisions make prescriptions regarding the disqualification of councillors from regulatory duties, including the evidence of bias.

Broadcast as defined under the *Broadcasting Act of 1999*, covers the new applications delivered by broadband. The Act refers to publicly viewed unidirectional telecommunications received over radio or any other telecommunications means or combination thereof<sup>32</sup>. A regime is set out for public, community and commercial broadcasting services. Interestingly, Chapter 1 of the Act excludes from its definition of broadcasting services, operators who make programs available on demand on a point to-point basis, including a dial up service<sup>33</sup>. In other words, an operator providing strictly video and audio streaming services through dial-up services over internet protocol does not require a license. This anomaly arises because, at the time that it was formulated, South Africa's broadcasting policy did not envisage an industry dominated by broadband or experiencing the present levels of technological convergence.

As regards broadband, the *Telecommunications Act of 1996* is notable for a licensing regime that conceives of telecommunications services as fixed, and compartmentalized. Chapter 5 of the Act allows operators to apply for licenses to provide public switched, mobile cellular, national long-distance services and VAN services. The placing into compartments of telecommunications services makes sense in an exclusivity period where Telkom is collecting revenues through a monopoly on the PSTN and distinct licensees engage Telkom for use of the PSTN. In a competitive market such categorizations will not work. The advent of broadband and multimedia portends alliances between different category players and the creation of new telecommunications players that provide a whole mix of services, straddling distinct technological and service categories as conventionally understood. The present emphasis in the Telecomms Act and ICASA procedures on distinct categories of telecommunications operators may no longer prove workable. An indication that the government is aware of this challenge comes in the recent Telecommunications Amendment Bill<sup>34</sup> of 1999, which proposes granting the Minister the discretion to combine a mobile with a fixed line license.

*The Competition Act* sets itself a number of objects, notably to promote efficiency, adaptability and development of the South African economy. The cornerstone of the country's competition policy addresses anti-competitive conduct, abuses of dominant market positions, and mergers and acquisitions. Competition policy is to be regulated by the Competition Commission and an appellate Competition Tribunal.

Importantly, the Act applies to all economic activity within, or having an effect within the borders of South Africa<sup>35</sup>. This definition introduces the "extraterritorial" operation of the country's competition regime. This means that actions undertaken outside the country's borders, but having an effect within the domestic market are subject to the Act and this will probably affect the South African operations of international telecommunications players. The Act prohibits restrictive practices between firms in a vertical relationship or horizontal relationship as competitors. Restrictive practices are agreements, co-operative or concerted actions between competing firms that reduce competition. This means that firms cannot fix prices or trading conditions. According to the Act, substantial shareholding is presumed to lead to such restrictive practices, but this presumption can be rebutted.

Under the Competition Act, a dominant firm is one that has market power to the extent that it can control prices, exclude competition or behave appreciably independently of its competitors. Certain practices are prohibited outright under the Act, while others are allowed where firms can show sufficient technology or efficiency gains. A firm that has a minimum of 45 per cent market share is regarded as dominant, while one with a 35-45 per cent market share is presumed to be dominant. There exists a further list of rebuttable

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<sup>32</sup> Chapter 1 of the Broadcasting Act

<sup>33</sup> Ibid

<sup>34</sup> Telecommunications Amendment Bill 30, 1999

<sup>35</sup> Section 3(1)

categories of the dominant position. The Act does not prohibit companies being dominant, but rather prohibits the abuse of dominance. Falling within the prohibited categories is not fatal to companies' operations, and firms in certain instances may be granted exemptions where their actions are consistent with specific objectives such as promoting exports or supporting SMMEs<sup>36</sup>.

Mergers and Acquisitions (M&As) are affected by the Act, and here a wide definition of M&A is used and companies will have to comply with relevant provisions. Share purchases and leaseings, amalgamations and combinations with competitors fall under the definition. Different categories of mergers (large and intermediate) are identified through the use of threshold amounts. There is a notification regime that firms will have to comply with in order to get a response on the desirability of any merger undertaken. The overarching consideration in deciding whether or not to approve a merger is whether the action is likely to reduce competition substantially. The Competition Tribunal is vested with wide enforcement and punitive powers and these include imposing substantial administrative fines, annulling agreements wholly or in part and ordering parties to a merger to sell shares or assets acquired under a merger process.

#### **7.4 Broadband and future regulation of South African telecommunications**

The South African regulatory environment is changing in ways that are consistent with the global trends ushered in by the worldwide deregulation of telecommunications markets. For example, there is an independent regulator, and telecommunications service provision is not monopolized by the state. Another revolution in telecommunications has been ushered in by the advent of broadband. However, a perusal of legal sources regarding regulation and market structure shows that South Africa continues to operate with a regime oblivious to the complexities raised by broadband. The following outlines the possible regulatory contours of the South African telecommunications market as it responds to the broadband challenge.

The overarching question facing the government will be whether to adopt an ad-hoc policy and tinker with the present regulatory regime in response to broadband challenges as they arise, or to fundamentally restructure the regime and develop a policy base covering broadband and other new technologies. Regarding the first alternative, were the present licensing regime to be extended to broadband operators, broadband operators would need a license to provide any service. The fragmentation of services predicted by the new technology will likely introduce differentiations in categories of license holders in response to new services, granting either class or specific industry legitimation. With the expected explosion in content and services, class licenses would mean that the regulatory oversight would not translate into costly fine-combing through infinite operations. Content application services will likely be licensed individually as the country with its newly formed Broadcasting Complaints Commission manifests its sensitivity to the social impact of mass media on the country. Additionally, specific industry licenses may be required to operate network facilities, provide network services, applications and content. Such a fragmented regime would be the most efficient way to exercise tight control over telecommunications infrastructure, whether to retrieve revenue, regulate content or to impose penalties for non-compliance.

Apart from licensing, an issue likely to attract attention under broadband and new technologies will be interconnection. This is because broadband technologies are likely to be introduced over existing telecommunications infrastructure. ITU conventions on technological standards are likely to be adhered to for compatibility with regional and international links. ICASA will likely retain policy prerogative on interconnection fees and technology. The Telecomms Act regulates interconnection and its scope of application covers 'telecommunications systems'. This scope is sufficiently wide to cover broadband technologies. The present regime is in line with international standards, which sees interconnection agreements being reached through commercial negotiations between incumbent operators and new entrants, subject to intervention by the regulator.

South Africa's competition policy may prove to be an obstacle to some measure to broadband operators. Convergence of technologies sees varied infrastructure and service providers from news, entertainment houses, hardware and software companies engaging in joint ventures and forming alliances. The definitive threshold of 35-45 per cent in dominance abuse and the extraterritorial reach of applicable principles will have consequences for these alliances. Given global trends of converging markets and technological convergence, many international players may find that their ownership structures or alliances fall foul of South Africa's competition policies before or relatively soon after entry into the domestic market.

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<sup>36</sup> Section 10

## **8 ARISING POLICY AND REGULATORY ISSUES FOR SOUTH AFRICA – COMMENTS FROM INDUSTRY PLAYERS AND GOVERNMENT**

### **8.1 Policy formulation**

The strategic objectives of broadband networks in South Africa are the subject of a new policy process currently underway which should be finalised by June 2001. Some of the objectives being mooted include:

- The recognition by the South African government of the importance of a high-speed broadband technology to advance the communications infrastructure of the country;
- Broadband technology applications and services can realise government objectives of providing high bandwidth access to all people for voice, data and video services;
- Broad based Internet access and ICT usage culture among the populace are two of the prerequisites for widespread e-commerce adoption.

Current government debates to bridge the “digital divide” include the creation of a broadband satellite network connecting all schools, colleges, technikons and universities in the country. This network will be exempted from current regulatory and tariff restrictions and will provide community access points at the schools. This Public Information Infrastructure will also be accessible to SMMEs and communities outside of school hours. The new policy proposals approved by cabinet also propose an e-rate which would require all operators to provide services to educational institutions at a 50 per cent discount of normal costs.

This is seen by the Government as the only way to provide affordable access to broadband services. This would not exclude the demand driven development of other globally competitive, private sector broadband networks servicing the needs of those who can afford it.

Technical policy issues be considered for broadband policy include:

- To ensure technological neutrality as long as it is in line with international standards, protocols or conventions and compatibility with other licensed technologies in the country;
- To ensure that public network operators satisfy requests for interconnection from other licensed operators in an objective, transparent and non-discriminatory manner;
- The sharing of infrastructure and facilities whenever possible to avoid unnecessary duplications and to minimise the negative impact of the environment, network carriers are encouraged to share infrastructure and facilities;
- Facilitating the supply of terminal equipment, by ensuring that there are no restrictions, provided that approval is obtained from the regulator.

### **8.2 Current regulations and issues in South Africa that may impact on broadband development**

#### *8.2.1 Competition and Ownership*

ICASA has issued regulations regarding limitations on ownership and control in respect of mobile cellular telecommunications services under Section 53 of the Telecommunications Act of 1996. These regulations place restrictions on ownership and control in a concentrated market (fewer than five telecommunications licences granted by the Minister or the Authority). Any person that holds an ownership or control interest in a telecommunication service licence cannot hold a similar interest in any other telecommunications network.

Another issue is restriction on a dominant telecommunication service licensee (more than 45 per cent of the market, or one who controls essential services) from acquiring an ownership or control interest in any other telecommunication service licence.

#### *8.2.2 Foreign Ownership*

There are no foreign ownership restrictions in the telecommunications sector, however they do exist in the broadcasting sector where no more than 20 per cent of a broadcast company can be foreign owned. While the cultural motivations for this are understandable and not unique to South Africa, the concerns that this may inhibit investment in cost intensive industries such as satellite and thereby stifle serious competition to

monopoly providers is of concern. In relation to satellite, the concerns are similar to those about cable dominance in other countries. With television penetration in households above 50 per cent, there is the possibility that satellite television, while currently quite expensive, could provide the major interactive gateway to the home. There are doubts that there is sufficient local capital available for a major infrastructure investment of this kind, necessary to provide serious competition to the incumbent provider, DSTV.

Many regimes, especially in developed economies, espouse market self-regulation as the catalyst for broadband services. Evidence from around the world strongly indicates that the introduction of competition and market access to broadband and other services, without regulation, is worth nothing. The historical domination of markets by monopoly operators in the telecommunications and broadcasting sectors and the overwhelming trend of advanced capitalism towards the concentration of ownership of markets requires regulation to create fair conditions for market access. In a case such as South Africa, where there is a legacy of social and statutory discrimination, to open up services for competition without some attention to issues of redress would simply perpetuate the status quo with regard to ownership and control within these sectors. In addition, while international organisations such as the World Trade Organisation place pressure on developing countries for open access to markets, developing markets may require additional regulation to ensure that local players are ensured some level of participation. Even mature markets that are being opened up for foreign ownership in terms of WTO rules are protective of their locally controlled industries, despite having had time to develop and consolidate them.

### 8.2.3 Affordability

Another issue that is critical for South Africa, as with other developing countries, is that of cost — the greatest factor inhibiting the take off of services is cost. New low cost broadband technologies have the potential to change this and at the same time provide high-end services with the potential to catalyse the sector in particular and the economy in general.

As stated previously, Telkom as the fixed line operator has primary rights to providing infrastructure. The planning of the infrastructure is the result of a complex and often-contradictory sets of demands and requirements. These range from demand for high-end services for the sophisticated business sector to the rural village requiring basic POTS access. The complexity of defining priorities for an institution of this nature, are immense. Balancing the rollout to under-serviced areas with rebalancing tariffs in order to prepare for competition, while at the same time preparing, for the first time, a regulatory chart of accounts in a monopoly operation with little accounting separation historically, is a challenging task. Among these drivers is the issue of delivering broadband services in the face of competition. The end of the monopoly will no doubt see a flurry of new technological options available to consumers at considerably lower cost. However, if this process only starts in 2002 or 2003 it will place South Africa a good five years behind other markets, which will seriously hamper take off within the sector.

### 8.2.4 E-Government

E-Government initiatives are widely considered to be a key catalyst and stimulus of the transition towards a network economy. This ranges from government procurement to developing systems to allow the individual citizen to interact and transact online with government departments.

In addition, if infrastructure development and application selection in government is done in an integrated and coherent way, major issues relating to equitable service delivery, access to information and other developmental matters could be addressed.

The applications for governance on Broadband access would, *inter alia*, include:

- Public Sector Campus Access - e.g. hospitals, tertiary institutions, correctional services, etc.;
- Telemedicine to the clinic and home;
- Tele-education - access to schools both urban and remote;
- Intelligent Transport Systems - fibre and broadband to the kerb, or to the home;
- E-government services internally and externally - GTC, GTG, GTB;
- Information applications such as Government On-line;
- Communications access centres.

### 8.2.5 *Culture and Content*

Another issue not as frequently raised by those countries leading the policy debates on broadband and convergence, is that of developing a broader range of multimedia content, particularly in languages other than English. This presents a particularly strong challenge to regulators in the area of local content development.

South Africa has, over the last five years, developed a strong commitment to local content and promotion of indigenous languages. Traditionally, local content requirements have only applied to conventional broadcasters. The question that arises is whether it is desirable, or even possible, to monitor and police domestic regulations for what is now essentially a global network and business?

## 8.3 **Policy and regulatory implications of broadband**

All these matters need special consideration against the backdrop of converging services made possible by broadband networks. The Special Project Unit in the office of the Secretary General of the International Telecommunications Union has identified a range of policy and regulatory issues pertinent to broadband.<sup>37</sup> Following interviews with Government, the regulator, industry associations, suppliers and operators, we explore some of these in relation to South Africa.

### 8.3.1 *New regulatory challenges and frameworks*

Most respondents argued that broadband networks with their convergent services certainly raised new challenges, particularly if one believed that the spread of broadband could redefine or reshape the global economy over the coming years. Specifically, new regulatory frameworks would be necessary to deal with the convergence between broadcasting and telecommunications.

Within the telecommunications sector, there is still a strong belief that infrastructure or carriage regulation should be treated quite distinctly from content regulation.

This is one of the most controversial areas of regulation in the newly converged areas of broadcasting, telecommunications and IT. Traditionally telecommunications operators and regulators have not had to concern themselves with the cultural and political area of content regulation, which has been left to broadcasting regulators. Those coming from the historically unregulated area of IT generally struggle with both infrastructure and services regulation as well as with content regulation.

Some respondents argued that the challenges may, however, be less about “regulatory” issues and more about promoting competitiveness of one’s country’s industries, fostering the link between connectivity and job creation, and ensuring that the country is not left behind on the wrong side of the “digital divide”.

One respondent suggested that: “Countries that impose stifling regulation on the telecommunications and broadband industry, or who strive to protect inefficient telco monopolies will be those that condemn themselves to the ranks of the information-poor. Countries with policies that foster a free-market approach and incentives for local broadband infrastructure and service providers are ensuring a place at the ‘information economy’ table.”

Several respondents argued that, in South Africa under the current regulatory regime, the incumbent telco tends to view all media infrastructure as telecommunications facilities that are protected under its monopoly licence. The respondents felt that the governing regulatory regime was ambiguous on this question. They further argued that a case could be made that broadband was never contemplated to be part of the protected monopoly. It was believed to be critical that, to avoid any uncertainty, new delivery media were defined in such a way that they were not exclusively included in the scope of the monopoly.

### 8.3.2 *Regulation of equivalent services irrespective of the medium of delivery*

There was overwhelming support for the idea that in principle there should be equivalent treatment of equivalent services, regardless of the delivery medium. As far as possible a technologically neutral position should be adopted by the regulator, especially when services such as voice, data and video were indistinguishable at the level of bits.

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<sup>37</sup> See <[www.itu.int](http://www.itu.int)>

With analogue, it was the very mode of delivery and, specifically, the use of the scarce public resource of spectrum associated with it that justified regulation of certain modes of delivery. It was precisely what was thought to be the finite nature of analogue spectrum that prompted regulation of radio services in the early part of the last century. The prospect of more or less unlimited spectrum offered by digitisation has profoundly undermined one of the major premises of radio regulations. Other issues nevertheless remain, such as ordered assignment and allocation of spectrum and regulating interference.

Regulating similar services differently on the basis of their mode of delivery undermines one of the central practices of best practice regulation, namely technological neutrality. Technology specific regulation has the potential to discriminate against different operators and result in unfair competition. Those in favour of different regulation for similar services on different platforms argue that it is the very medium of delivery that makes them distinctive. It is for this reason that they reach different audiences and, from a fair competition point of view, what differentiates their cost structure and therefore presumably their obligations. This was a minority view.

It may be worth noting, however, that in the short to medium term, the average consumer's access to media services will remain relatively unchanged in terms of medium of delivery. Thus, a regulatory regime that acts too soon to distinguish services by medium of delivery, may risk downstream difficulty in promoting investment in new technologies.

There may be times, however, when government policy seeks to encourage the deployment of broadband infrastructure, and may therefore grant incentives to those who invest in the deployment of broadband infrastructure, it was argued. The approach taken by Malaysia in promoting the "super-corridor" was cited as an example of a pro-active policy of promoting broadband connectivity.

In South Africa to date, the incumbent monopoly telco has benefited from asymmetric regulation in exchange for universal service obligations. Some respondents argued that while the reasons for this are well understood as a way of correcting the imbalances of the past, the incumbent has used it in a predatory manner to stifle all possible forms of competition in new business areas such as the provision of broadband infrastructure and services.

Protectionism, it was argued, served to hamper the penetration and adoption of new broadband services and to work against the goal of promoting an enabling environment for universal access. In attempting to give effect to the universal service policy of Government, some argued that the regulator has allowed the incumbent a far broader monopoly than what was necessary in terms of legislation and has done so contrary. While agreeing with the idea that equivalent services should be regulated similarly, the broadcasting fraternity also argued that an entirely new approach to broadcasting would be necessary in the digital era, as services did not remain static. A multiplex for example, can shift from 10 services to four in drive-time. In such a complex environment, they proposed that regulation that removes the burden of monitoring compliance from the regulator should be favoured. The specific example cited was the requirement on Multiplex licences in the UK, where companies are required to do their frequency planning, which is then approved by the regulator.

The signal distributors and the telecom operators qualified their acceptance of the concept of symmetrical regulation with the proviso that transitional regulation would be needed to protect existing players and to deal with any bottlenecks that may occur during the transition. In this spirit, some respondents argued that services should not be regulated at all or should be given "class licences". It was infrastructure that required regulation, some argued, especially to avoid unnecessary duplication. Most importantly, the respondents felt that regulations must be enforceable, and should not negatively impact on business without there being some public interest imperative.

### *8.3.3 Merger of regulatory structures in order to ensure appropriate balance in the regulation of converged technologies*

Most respondents agreed that the convergence of regulatory structures in order to deal effectively with a converging communications environment was inevitable. Many argued that while this had started in South Africa with the physical integration of the broadcasting and telecommunications regulators, the regulation of these traditional distinct sectors would need to be more evolutionary and develop in response to new issues as they came before the authority. This was not likely to happen by virtue of being in a single institution but would rather depend on changes in technology and consumer responses to these.

The levels of co-ordination and integration required for broadband services to operate certainly require a rethink of the historical separation of broadcasting and telecommunications structures. However, many respondents argued that content regulation requires a different set of skills from carriage regulation.

Perhaps more important and more challenging than the physical integration of these historically distinct agencies, however, is the philosophical development of a new regulatory approach that is much more all-encompassing than those of its predecessors. Effective regulation in the era of convergence will require greater flexibility and imagination than ever before, if the benefits of the new technologies are to ensure equity in service provision, yet not stifle innovation and investment.

Most respondents agreed that the establishment of a single institution made sense from an efficiency standpoint. However, it is vital to ensure that within the merged entity there exists a sufficient body of operational expertise for all relevant service types. Often the regulator will need to resolve conflicting demands on resources from different service types and it was felt to be critical that the merged entity should not be seen to favour one service type above another.

Merging regulators that come from incompatible or “old” paradigms was cited as a particular challenge. Some examples of old paradigms conflicts identified by Anders Henten<sup>38</sup> include:

- Infrastructure regulation is usually based upon the premise of some scarce or limited natural resources which are in public trust, and which have a value attached. This assumption becomes less true once broadband technologies are widely penetrated and bandwidth becomes far less of a scarce commodity;
- Content regulation is usually based upon protection of certain values - protection of democracy, protection of minors, and the wish to promote local culture or the local content industry. This is no less true in a broadband world, but content regulation on a medium like the world-wide web becomes far more difficult to apply in practice, and is much more influenced by voluntary codes of conduct and consumer pressure groups;
- Cross-media ownership regulation has been based upon trying to ensure that no individual amasses an overwhelming media ownership so as to exercise undue influence upon the populace. In the Web world, this function tends to be taken over by anti-trust regulation;
- Service regulation is usually targeted at ensuring equal and universal access to certain services regarded as basic. Access remains an important issue in broadband, in ensuring that no infrastructure owner (such as an incumbent telco or a “last-mile-service-provider”) is able to exclude access by the customer to other service providers.

In contrast, the world of broadband, with its borderless nature, raises a whole host of new priority issues that may be far more relevant to address. Some of these are:

- The tracing and combating of cyber-crime in all its forms (hacking, virus propagation, denial of service attacks, credit card fraud, etc.);
- Commercial issues around e-commerce, such as non-repudiation of a transaction, dispute resolution, jurisdiction rules, taxation, authentication, electronic signatures, etc.;
- It is doubtful whether these issues would be or should be addressed by telecommunications regulators, as they fall into normal commercial, trade and criminal justice arenas.

#### 8.3.4 Maintenance of effective competition

For many countries elsewhere in the world, the debates are somewhat different as they are introducing broadband services to already liberalised markets. The new challenges posed by broadband technologies will be compounded by the need to develop strong rules and practices on basic competition regulation that have not yet been adequately formulated. In addition to the social and economic regulatory challenges posed by converging networks and technology, South Africa has yet to provide the basics of a fair competitive regime that will reduce the barriers for new entrants to the telecommunications market and safeguard the interests of consumers.

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<sup>38</sup> Henten, A (2000). Regulation in a Liberal, International and Converging Communications Market, in Cammaert and Brugelmann, Beyond Competition: Broadening the Scope of Telecommunications Policy, VUB University, Belgium.



The key areas of such regulation include:

- Universal service and access financing;
- Tariff control;
- Prohibitions on cross-subsidy and discrimination;
- Accounting separation;
- Interconnection.

Competition can only be established and maintained if it is commercially viable to do so and the regulatory environment needs to encourage that. The viability of new broadband services will be determined by a number of factors i.e. the level of capital investment, cost of finance, the speed of take up of the services, the level of capacity use and the timely achievement of cash-flow. Secondary factors identified included capacity rollout, sharing of common physical infrastructure, the existence of other high cash generating operations, having critical mass in operation through synergy between services, the avoidance of over-segmentation of the market in the run-up phase and access to appropriate technology.

Competition will be promoted by ensuring a level playing field for all players and by ensuring that incumbent PSTS operators and mobile operators do not leverage their voice dominance into enhanced data services.

In the area of broadcasting, it was specifically argued that the focus on broadband regulation should be on enabling local industry to compete successfully in our market. This was also critical to becoming globally competitive. The longer DAB and DTT licensing was held up, the more difficult this would become.

#### 8.3.5 *Cross Ownership Between Different Networks*

The issue of cross ownership, so central to the policy objective of ensuring democracy and diversity of information and opinion, is threatened by the realities of this new global industry. On the one hand, new technologies make possible the access to more information than ever before to those with the means to access it. On the other hand, there is the trend towards greater concentration of ownership among the biggest global players, with recent mergers towards establishing effective convergence-ready companies commanding the highest prices ever recorded in any sector. Some respondents argued that, provided there are adequate anti-trust regulations in place, this is not the jurisdiction of telecoms specific regulation.

Several respondents argued for diversity of ownership and acknowledged the need to regulate this in liberalised environments to avoid dominance or private monopolies.

From a policy perspective, while one may seek to enable the participation of multiple players, especially local players, the capital outlay required to build and operate broadband networks is substantial. The likely players with the resources to sink these substantial investments into the country will be those who can optimise and leverage their existing businesses across new platforms. Multimedia, almost by definition, will make strict cross media restriction very difficult. If such restrictions are strictly implemented, they are likely to stifle investment and business and indeed real competition. If serious infrastructural competition is a policy objective, cross ownership and foreign ownership limitation will need to be made more flexible, creative participation mechanisms for local business developed and opportunities for service competition increased. Not developing a careful framework to ensure these outcomes will simply allow the first to market in the broadcasting and telecommunications sectors to become the de facto monopoly gateway providers to the home.

#### 8.3.6 *Infrastructure sharing, standardising open standards for set top decoders, establishment of alternative infrastructures and use of spectrum*

Infrastructure sharing requirements are appropriate where there is clear abuse of position by a monopoly. Some aspirant players believed infrastructure sharing and roaming was essential for at least a limited period of time to reduce the barriers to entry in markets that had very dominant incumbents, which is the case for both the fixed and mobile market in South Africa. Incumbents on the other hand argued that such matters should be left to commercial arrangement otherwise it was likely to push up costs.

The GSM operators particularly believe that standardisation had been the key to their success, particularly as it had created the necessary economies of scale that might not otherwise have been there in smaller markets.

In the broadcasting domain, the experience in this area lies with the subscription broadcaster. On the topic of efficient use of the spectrum, it was argued that the move to digital terrestrial TV and the achievement of sufficient penetration in order to achieve a switch-out of the older analogue services has had too ambitious a timetable elsewhere in the world. The projected switch-off date completely ignored the trajectory of the take-up of the new service/technology (the classic adoption curve for new services or technology).

On the issue of set-top decoders (STB's), the concept of open standards has been vigorously pursued by the DVB in Europe and OpenCable in the USA. A subscription management service provider that operates a DTH service noted that these are both industry-led and not government regulated or imposed standards.

Two lessons emerge:

- It is difficult if not impractical to achieve a truly inter-operable STB from the viewpoint of the middleware within the STB. The standardisation process has been so cumbersome and complex that it has been overtaken by market realities, and the goal of a truly "universal" STB is difficult to attain. (In Europe there is an agreed DVB specification for Java-based middleware, known as the Media Home Platform "MHP", but no significant deployments have yet occurred);
- In the arena of conditional access, security considerations lead to the conclusion that the interests of interoperability work against the integrity of the security. The best compromise that could be achieved was that of the so-called DVB common interface, and the "simulcrypt" interface. Operators will always have proprietary conditional access systems, without exceptions, in all markets, because of the importance of being first to market. It is likely that, if South Africa wishes to reduce the barriers for new entrants and ensure multiple players, at least initially, infrastructure-sharing requirements, such as roaming for new entrants on competitor networks, will be necessary.

However the South African Digital Broadcasting Association argued that there were political reasons to push migration from analogue to digital. A short migration period will provide quicker universal access to information they argue, as well as affordability through economies of scale and sharing broadcast costs because of the larger number of users on the same capital cost of network. The cost of the digital network would be one third the cost of the analogue network during the migration period, therefore the total cost during the migration would be one and one third the digital price.

Standardising open standards would improve viability if it is a widely supported standard and is not owned by an entity that is being competed against. Standardisation of receivers and decoders to avoid "lock-in" into dominant subscriber services is critical to protecting new entrants and consumers, as are limitations on the period of subscriber contracts. In this regard numbering portability becomes a major competition issue to make possible the movement of consumers between services without the loss of the number and the associated costs for business and inconvenience for individual consumers.

Alternative infrastructure can also support competitive viability if the entity involved is large enough with a wide range of services being utilised, or alternatively, if the infrastructure is shared in a consortium competing with others.

The growing cost of spectrum will affect the viability and competitive position if the pricing of spectrum is higher for a later entrant or higher frequencies have to be used to compete for the same service. Spectrum efficiency is only an indirect factor that will enhance profitability and will depend on the technology used to increase efficiency.

### 8.3.7 *Unbundling the local loop*

Several debates in the more developed economies place the unbundling of the local loop at the centre of delivering competition in the information age<sup>39</sup>. In the UK, the telecom regulator, Oftel, required British Telecom to make available its local loops to the other operators as the central mechanism to introduce competition into the provision of higher bandwidth access. The regulator describes this, not as an end in itself, but as the beginning of a "process to facilitate the delivery of high-speed information age services to consumers". It argued that while the dominant operator in the UK had gone to considerable length to develop broadband services, which was encouraged and welcomed, "BT alone providing access was not sufficient to ensure competitive prices and choice for consumers, nor to encourage innovation in the provision of access".

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<sup>39</sup>OFTEL (1999) Access to Bandwidth: Delivering Competition for the Information Age, at <[www.oftel.gov.uk](http://www.oftel.gov.uk)>

While Britain with its high levels of services access and quality, high per capita income and strong economy provides a very different context than South Africa, several respondents argued that the principles driving the unbundling of the local loop pertain equally to South Africa. The development and growth of the new economy and information society, however they are defined and whatever national priorities overlay them, is dependent on access to bandwidth. Unbundling the local loop is an obvious mechanism for the creation and development of service competition and for making possible the engagement of consumers in that new economy and society.

Some respondents argued that it was especially appropriate for developing countries, because as much as possible should be done to provide delivery mechanisms to under-serviced areas or previously disadvantaged areas. This would also have the effect of driving down local call costs, which would mean affordable access to information. It was also argued that it would encourage innovation of services and applications and that this had a multiplier effect for e-commerce, tele-medicine, access to information and employment.

Technically, some respondents argued, due to the uncertainty of the quality of the existing copper infrastructure in South Africa, competition on wireless local loop may be a better option.

Other respondents also pointed out that the unbundling of the local loop where it existed should be distinguished from unbundling the right to provide the local loop from Telkom's exclusivity. This has been pushed by those wishing to provide services in under-serviced areas through co-operative ventures or in partnership with local authorities. The government has recently begun to entertain such notions with the proviso that this could only happen in areas with a teledensity below 2 or 3 per cent. The response to this view has been positive, however, the threshold has been criticised as far too low, with suggestions that it should be in areas with teledensity anywhere below the national average of around 15 per cent.

#### *8.3.8 Universal Service Requirements for Broadband Services*

It was widely agreed among the respondents, including government, that, given South African demographics and assuming that broadband services would be affordable largely in metropolitan centres, the focus of universal service delivery should be on the support of the nationwide delivery of government, education health and social services. A universal service approach should also encourage the support of small, medium and micro enterprises (SMME) in rural areas. Community access centres should be targeted, as should local authorities. Broadcasters argued that multimedia broadband delivery nationwide was possible to the general public through digital broadcasting.

That South Africa will need to pay special attention to ensuring that the introduction of broadband happens in ways that are equitable to all citizens, especially those that are not currently consumers of these services, is a given.

Given the constraints identified earlier, of licensing global networks and placing effective public service obligations or ownership limitations on them, the principle of "pay and play" would have to be adopted from a regulatory point of view. If such an approach was kept flexible and simple, it could be implemented effectively and efficiently to provide national agencies with the resources to ensure that the benefits of these enabling and lucrative sectors are enjoyed by all. The framework should be able to recognise and encourage those operators and companies delivering services or innovating technologies that redress past imbalances or provide developmental solutions.

Ways of making services affordable so that broadband infrastructures are optimally utilised was also a critical aspect of universal access identified by Government. This would require a whole new examination of costing, focusing on quantity of information transmitted rather than time spent to transmit.

Broadband, however, by its very nature, has the potential to alleviate current communication backlogs. The CU xDSL variants offer important breakthroughs in basic services provision and access. As international trends move to defining basic universal service in terms of a full range of services, including Internet, it is likely that Internet Protocol (IP) will become the de facto mainstream carrier of all types of traffic. The benefits of this from a policy and regulatory point of view are manifold. At a human level, the adoption of this approach provides practical ways of addressing the digital divide. This is made further possible at the technical level by leapfrogging traditional infrastructural developmental stages and is likely to spawn a range of multipliers including capital investment and service sector growth.

A GSM operator argued that mobile cellular lent itself to IP connectivity for e-government data hungry services such as hospitals or schools in under-serviced areas. There was the benefit of limited installation

costs and the ability to cost effectively run a range of effective applications and these contributions should be considered in determining universal service obligations.

Some responses included calls for a more converged approach to universal access both at the regulatory and delivery ends. It was proposed that existing agencies and proposed agencies for meeting broadcasting and telecommunications needs, such as the Universal Service Agency and the proposed Media Diversity and Development Agency be housed and operated as one and that existing radio and telecentres be used as multimedia centers.

#### 8.3.9 *Domestic regulation of a global network.*

Some respondents argued that it was neither feasible nor efficient to try and regulate the content on a global network such as the Internet. However, several respondents pointed out that domestic regulation would be possible and necessary due to the dependence on basic telecommunications networks and to ensure compatibility and interoperability. The government position is in accordance with this. It points out that domestic regulation is appropriate, as long as there are international gateways for telecommunications providers and operators are licensed to build them. It was agreed that content regulation other than for ensuring social justice, even if possible, was an injudicious use of state resources.

Other respondents argued that the strongest role a local regulator can play is that of an enabler, to ensure that the interests of the country are looked after by means of pro-active and incentivised deployment of infrastructure and services.

#### 8.3.10 *Technical, institutional and financial barriers that could delay the provision and take up of broadband services*

The technical barriers to take up were not considered significant, but financial barriers were, mainly due to the limitations of the South African economy and market size. Several respondents argued that Government could intervene to facilitate take up by minimising the impact of institutional barriers and maximising the use of broadband on a commercial basis by all state institutions.

Several people identified the shortage of skilled human capital as a major stumbling block to the expansion of the sector generally.

Barriers to take-up include:

- Affordability of the service which, in turn, is driven by the costs of investing in the infrastructure and its deployment;
- Availability of trained personnel to do the installation of the cable (or DSL/ modem);
- Availability of compelling content (eg streaming media) and “killer” services for which people are prepared to pay.

The only appropriate intervention by government in this process would be by way of incentives to enable and encourage deployment of the infrastructure, some argued.

## 9 CONCLUSIONS

While not exhaustive, the study has identified a number of the current constraints and future conditions that will be required to facilitate and encourage the large-scale adoption and application of broadband.

What is apparent is that the development of broadband networks and application of the associated technologies is intrinsic to the development of the information and communication sectors specifically and the economy as a whole. With sound infrastructure planning and innovative regulation, broadband has the potential not only to provide high-end services to the business sectors but a range of lower cost, high quality services to all.

Critical to realising these opportunities is the design of a policy framework that encourages the vast amounts of local and foreign investment needed, together with a regulatory regime that provides certainty and transparency and guarantees fair competition and consumer protection. The basic elements of these, many of which are absent currently, include a fair interconnection rate and facilities leasing regime that encourages new business, tariff regulation that protects consumers and mechanisms to avoid predatory and discriminatory pricing by competitors. The importance of the accounting separation, in a situation where a

monopoly operator has existed on the basis of extensive and often untransparent cross-subsidisation, is also critical. Until this is done, it will be impossible to apply cost based mechanisms that encourage competition, such as interconnection and local loop unbundling, and that are essential to broadband growth.

Finally, from a more overarching perspective, the need to integrate various policy initiatives and implementation of projects into a single coherent strategy has become imperative for the success, indeed survival, of the country in the information era. It will no longer suffice to develop national broadcasting or e-commerce policies distinct from IT trade strategies or health and educational policies separate from communication and information policies. The time has come for policies to be part of a broad national information and communication policy and infrastructure that is well integrated and co-ordinated.

## ANNEX

### Notes on Internet Market

The number of South Africans gaining access to the Internet through corporate networks linked to the Internet via high-speed digital leased lines continues to grow rapidly. Corporate users in South Africa were estimated to be more than 600'000 in November 1998. More than 3'000 digital leased lines have been installed for companies and corporations in South Africa. Conservative estimates suggest that, on average, each digital leased line provides access to a hundred users, giving a conservative total of 300'000 corporate users. 1999 surveys indicate that the number of corporate users in South Africa was closer to 700'000 (end of 1998). More cautious implementation of connectivity among corporate white-collar workers and delays by Telkom in making infrastructure available notwithstanding, the 2000 survey showed growth in users (as distinct from leased line connections) of around 40 per cent over the preceding 12 months. This brings the number of corporate users in South Africa to around 980'000 (end of 1999).

Academic Internet access is provided primarily via Uninet, which provides access to most research and tertiary education institutions in Southern Africa, as well as to more than 200 schools either directly or indirectly. The total student population it serves — and who therefore potentially has access to the Internet — is more than 600'000. While a majority of these students do not use their access, e-mail is becoming an increasingly important medium of academic activity. Based on feedback from university network administrators, the probable minimum for students actually using this access is about 250'000. Privately funded schools connectivity probably accounts for a further 30'000, bringing the total academic user base to 280'000.

In 1997, dial up subscribers were estimated at 154'000, however this figure had grown to 240'000 users by March 1998. This base grew by 130'000 users in six months from the end of March 1998 to the end of December 1998. By the end of 1998 the number was found to exceed 366'235. However, growth for 1999 was substantially less than 100 per cent in one year. Nevertheless, the growth in absolute numbers remained strong, with the dial-up user base probably reaching the 558'000 mark by the end of December 1999.

Taken together, these three categories amount to 1 820 000 Internet users in South Africa at the end of December 1999. Research indicates that it would be safe to forecast the number to have grown to around 2,4-million by the end of 2000.

**Table A1: Internet users in South Africa**

Category	Dial up	Corporate	Academic	Total
1998	366'000	700'000	200'000	1'266'000
1999	560'000	980'000	280'000	1'820'000

Source: Acuity Holdings 2000 Annual Internet survey

The Internet community in South Africa is also 30 times larger than any other in Africa. Whilst estimates place users in South Africa at approximately 1 in 65 (1999), this is still well below the world average of 1 in 4.<sup>40</sup>

The number of Internet Service Providers (ISPs) continues to swell and decline periodically as there are constant new entrants and considerable vertical as well as horizontal integration amongst existing ISPs.

#### Limitations on licence

#### Limitations on control of private broadcasting services

Section 49 of the IBA Act prohibits the direct or indirect control of more than one private television service by any entity. On application, however, the Authority may exempt such a person, on good cause shown, from adhering to any one of the limitations considered in the section.

<sup>40</sup> Annual Internet Survey, © Media Africa and Acuity Group Holdings, 1999

In order to limit the concentration of ownership in radio, the legislation restricts ownership by a single entity to not more than two private FM and two private AM stations. This has been viewed as a fetter on the industry and acceptance of the need to amend this aspect of the legislation is believed to be quite far advanced.

#### Limitations on cross-media control

Relatively complex cross-media control regulations have been prescribed by the IBA that aim to restrict the influence of media owners across different types of media. No person who controls a newspaper, for example, may control a radio and television licence.

#### Limitations on foreign ownership

In line with the long standing national imperative that effective ownership and control of the broadcasting industry should remain in the hands of South African citizens, current foreign ownership regulations on private television and radio limit foreign ownership to 20 per cent. However the Broadcasting White Paper highlights that government is of the opinion that the present limit should be raised in order to facilitate the increased investment necessary for global competitiveness.

#### Cellular Market

In terms of the accompanying Multiparty Implementation Agreement (MPIA), MTN and Vodacom were required to install community service telephones (CSO) to under-served areas for a period of five years. Vodacom and MTN are obliged to deploy 22 000 and 7 500 community service telephones respectively. Both cellular operators were expected to fulfil their obligation by June 1999. Since 1994, the South African cellular telephony market has continued to grow rapidly, building on the incredible success achieved since the service was first offered. The industry has contributed vastly to South Africa's economy in terms of fixed investment, license fees, tax revenues and employment, not to mention the positive effect that cell phones have had on the other sectors of the economy.

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**Table A2: List of Interviewees**

Director-General, Department of Communications
Media Investment Holdings (MIH)
Mobile Telecommunications Network (MTN)
Independent Communications Authority of South Africa (ICASA)
3COM (SA)
South African Digital Broadcasting Association (SADIBA)
SENTECH (Common Carrier Signal Distributor)
Telkom (SA)
Vodacom

Source : Case study author.

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