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Department:  
Communications  
**REPUBLIC OF SOUTH AFRICA**

## **SOUTH AFRICA CONNECT: CREATING OPPORTUNITIES, ENSURING INCLUSION**

*South Africa's Broadband Policy*

**OCTOBER 2013**

**DRAFT FOR DISCUSSION**

**NOT FOR CIRCULATION BEYOND WORKSOP PARTICIPANTS**

## **Executive Summary**

The national broadband policy and the associated strategy and plan, South Africa Connect, gives expression to South Africa's vision for the country to develop a seamless information infrastructure by 2030 that will be universally accessible across the country at a cost and quality that meets the needs of citizens, business and the public sector and provides access to the creation and consumption of a wide range of converged applications and services required for effective economic and social participation. As the National Development Plan indicates, this widespread broadband communication system will underpin a dynamic and connected vibrant information society and a knowledge economy that is more inclusive, equitable and prosperous. "This ecosystem of digital networks, services, applications, content and devices, will be firmly integrated into the economic and social fabric of the country. Together, these broadband elements provide an enabling platform for economic enterprise, active citizenship and social engagement and innovation. It will: connect public administration to the active citizen; promote economic growth, development and competitiveness; drive the creation of decent work; underpin nation-building and strengthen social cohesion; and support local, national and regional integration".

By creating the conditions in a modern electronic world "to improve the quality of life of all citizens and free the potential of each person" and, in doing so, enable equality in the rights, privileges and benefits of citizenship, including guarantees of freedom of expression and association in the Bill of Rights, this policy contributes further to promoting the Constitution of South Africa.

The policy reflects the Government of South Africa's commitment to creating an enabling environment for the rollout of broadband infrastructure and the creation of associated content, applications and services. It does this by indicating the intended structure of the industry and the institutional framework necessary for effective regulation of an open and fair competitive environment. Furthermore, it encourages public and private investment in the broadband network extension required to meet the social and economic needs of the country. The arising regulatory framework is informed by the principles of openness, inclusivity, universality and technological and service neutrality.

In order to meet the national objective of more affordable broadband access for all, South Africa Connect provides for both demand side and supply side policy interventions. On the

supply side, it identifies as necessary the deployment of an open access national wholesale broadband network that will make use of available existing and new fibre and high-speed wireless networks as the base from which to extend broadband access across the country. This will be accompanied by a regulatory regime that ensures that principles of open access are applied to ensure that access is open to any operator or service provider on a cost-based, non-discriminatory basis. This enables the pooling of infrastructure owned by the state and by other private entities that wish to be part of the wholesale access network, avoiding unnecessary duplication of infrastructure where it already exists, leveraging public and private capital for high cost network extension and creating conditions conducive to services-based competition, and this will address the current pent-up demand for affordable broadband services in the country.

To improve access to the Internet and stimulate demand for broadband connectivity further, the connection of educational institutions, municipalities and government and the deployment of free public WiFi networks at these points of connection for citizens to access m- and e-government services and other public services, will be prioritised. To enable more equitable use of the Internet, the inclusion and extension of ICTs in the formal school curriculum development will be supplemented by a national e-literacy project aimed at those currently marginalised from using services because of their lack of exposure or skills. The national e-literacy project will draw on matriculants and graduates who are unemployed through the development of a youth employment programme for this purpose.

The technical target is to achieve a universal minimum download speed of 100Mbps by 2030. To reach this goal in a progressive manner, minimum speeds of 5Mbps should be reached by 2015 for 50% of the population and 100% by 2020. Upload speeds should be no less than half of the download speeds, and poor latency as a result of international routes needs to be dramatically improved, through effective quality of service monitoring and enforcement of compliance with regulated standards. The rapid evolution of broadband technology means that these targets will be reviewed every five years.

This policy envisages a national project, SA Connect, that will mobilise the capabilities, resources and energy of public and private actors towards realising a bold vision of a connected society, achieved in the spirit in which South Africa has united in the past to deliver on major international events.

South Africa's broadband ambition will be reached through four complementary strategies that will be realised in a detail implementation plan that arises from this policy.

**Digital readiness** - laying the foundations for our broadband future

The creation of an enabling policy and regulatory environment is key to the successful outcome of this national project. The review of policies and institutional arrangements that constrain the competitiveness of markets and their effective regulation will be fast-tracked in the current ICT Policy Review process, so that an autonomous, accountable and well-resourced regulator is created, with the capacity and competencies to ensure that this broadband policy is implemented effectively and urgently.

The removal of administrative bottlenecks and lowering of hurdles will greatly accelerate build-outs of existing wired and wireless broadband. National government, through the Department of Communication (DOC) and Presidential Infrastructure Co-ordinating Committee (PICC), will co-ordinate and integrate broadband rollout across the different tiers of government, building on and learning from the significant advances already made at provincial and municipal levels. Via the relevant agencies and authorities, including the SANRAL, municipalities and Department of Environmental Affairs, SIP 15, the committee dealing with telecommunication infrastructure within PICC, will streamline the application for and granting of wayleaves and other approvals inhibiting broadband network builds and will co-ordinate the building of civil works and ducting to avoid the duplication of such activities. The DOC will also ensure that impediments to wireless broadband rollout are removed, by issuing the necessary policy directives to ICASA to ensure the rapid assignment of high demand spectrum required to extend the wireless component of the open access broadband network by mid-2014.

**Digital development** - addressing needs and ensuring sustainable rollout

Public sector demand will be aggregated to provide economies of scale and scope to procure discounted, high quality services to meet the needs of public sector users.

This will simultaneously serve the communication needs in critical areas and enable network extensions in areas that are unconnected and where market forces alone may not result in the network builds by network operators.

The broadband needs of education and health, the two primary areas of human development, will receive immediate priority. Every school and health facility will be

connected with 10Mbps by 2015 as part of an integrated strategy to meet the specialised needs of the public health and education sectors.

Investments in these priority areas can proceed immediately and will initiate the expansion of South Africa's broadband infrastructure and stimulate demand, as the roadmap and model for South Africa's national broadband networks is being developed.

The aggregated public sector demand can be transferred to the new open access broadband network, once established, to create an 'anchor tenant'. This will serve to induce public and private investment in the network, by guaranteeing investors significant demand, which enhances the viability of the network, as discussed below.

**Building the digital future** – This will include a strategy to encourage public and private investment in the next generation broadband network in a manner that will initiate long term collaboration to establish a globally competitive national broadband network. This national network will build on existing fibre and high speed wireless infrastructure in the country, coordinating the rollout of green and brown field infrastructure to extend the network to unserved areas. Whilst the benefits of such a world class infrastructure are undisputed, implementation of such a complex and costly project will require a roadmap that guides the actions of public and private sector players over the next 10 to 20 years.

**Realising Digital Opportunity** – Extension of broadband access throughout the country is a necessary condition for digital inclusion and innovation, but it is not sufficient. Realising the benefits of a world-class broadband infrastructure requires complementary policy action related to skills, research and development (R&D), innovation and entrepreneurship; to content and applications as well as to ensuring demand. The multiple development and incentive programmes in all these areas will form a key part of the broadband and funding plan and will include a local content and applications development fund, and dedicated ICT entrepreneurship and R&D funds.

In addition, there will be a massive human development drive firstly, to meet demand-side skills necessary for end users to more equitably exploit the potential of broadband Internet and secondly, to deliver upon the supply-side skills necessary to optimise the entrepreneurial and job creation opportunities engendered by infrastructure investment of this kind. Primarily this will focus on mainstreaming ICT through out the basic education

curriculum but will also include the deployment of youth as part of a youth development programme aimed at creating e-literacy among amongst those current marginalised from ICT-based services through libraries, multipurpose community centres and a volunteer, each-one, teach-one national youth programme.

As a flagship national project and because of the cross-cutting nature of ICT and broadband in particular, cross-sector state co-ordination will be facilitated from within the Presidency to support the integration and application of state resources, enhance state capacity and competencies and optimise public service delivery.

The Minister of Communication will appoint a Broadband Council of public and private sector experts on adoption of this policy, to oversee the implementation of South Africa Connect and to flexibly adjusting programmes of action and priorities to meet changing needs and emerging trends.

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## **1. Introduction**

Broadband is increasingly regarded as a strategic infrastructure essential to meeting the needs of knowledge economies and information societies, enabling economic and social inclusion and as a key determinant of global competitiveness. This is premised on the development not only of interlinked physical networks, but an entire connected ecosystem of services, applications and content that open up and create efficiency in information flows that improve productivity, stimulate innovation, resulting in diversity of services and increased demand, resulting in job creation and all this in ways that enable greater participation, transparency and accountability.

The hallmark of this decade has been the use of ICTs - made available on an unrepresented scale through broadband development - to advance democracy. In democratic states this has been formally undertaken to enhance the free flow of information and to safeguard freedom of expression and other human rights, and informally under conditions of state hostility towards public action. It remains a major policy challenge in the intangible world of the internet to ensure that the rights of the individuals and of communities are not infringed upon and that constitutional rights are safeguarded through the creation of enabling legal frameworks and through open and accountable government in a digital world.

Economically, there is increasing evidence of linkages between investment in electronic communications infrastructure and secondary improvements in the economy, enabled through information and transaction efficiencies. Consumer access to high quality broadband services is predicated on national backbone networks that are capable of supporting rapid growth in traffic, at competitive prices. Under such conditions, research suggests that a rise in broadband penetration is linked to economic growth and job creation. Though broadband impact studies vary on the exact contribution made to economic growth, there is enough evidence to support claims that increases in broadband penetration correlates with increases in GDP, new jobs, broadening of educational opportunities, enhanced public service delivery and rural development.

Enjoyment of these positive network effects is conditioned on broadband reaching a critical mass which in developing countries is constrained not least of all by the high price of broadband services. Ensuring affordability of broadband is therefore a critical issue, as is the creation of demand-side skills that enable optimal end-use of available services. A further serious challenge for developing countries lies in the creation of the supply-side skills

needed to ensure the economic and innovative potential of broadband. Broadband plans need to contain strategies to address these deficits.

Funding of broadband extension under these conditions is therefore a major challenge. Efforts to reform telecommunications globally over the past two decades has limited public intervention to policy-making and through liberalisation, privatisation and the independent regulation, sought to encourage private investment. The need to build high cost broadband networks has changed the interplay between state and market, acknowledging the need for co-ordinated national strategies and the resumption by the state of some the investment risk that had been almost entirely transferred to the private sector.

The high investments and sunk costs required to establish next generation networks have generated different forms of public and private delivery across the globe. Emerging success stories derive from a public-private interplay where the relative powers and resources of both sectors are leveraged to achieve wide-based national benefit from the population's access to high speed broadband, via the social and economic opportunities and innovation that this can bring. Such shared allocation of risk can produce the most appropriate incentives for investment, with significant implications for the availability, cost and quality of services.

## **2. Problem statement**

Lack of development of always-on, high speed and quality bandwidth in the access networks (last mile) required by business, public institutions and citizens to enable the positive multiplier effects associated with broadband penetration, and described above, has impacted negatively on the country's development and global competitiveness.

Significant growth in the ICT sector over the last decade has not been accompanied by realisation of the primary policy objective of affordable access for all to the full range of communications services that characterise modern economies.

The slow deployment of fixed broadband services (ADSL) and its relatively high costs meant that over the last five years, as with voice and despite its relatively high cost, mobile broadband rapidly became the primary form of broadband access, rather than provide a complementary service to fixed broadband, as it has done in mature economies.

Yet despite this take-off in mobile broadband, South Africa's broadband penetration remains poor compared to that of other lower-middle-income countries. South Africa has lost its

status as continental leader in broadband and Internet, and the last two decades has seen a steady descent down global ICT indices. South Africa's ranking on the International Telecommunications Union ICT Development Index, (IDI) which includes broadband indicators has slipped from 72nd in 2002 to 90th in 2012 (ITU, 2002, 2012). South Africa now ranks fifth in Africa after Mauritius (69), Seychelles (71), Tunisia (84), Morocco (90), and Egypt (91) in the IDI Index (ITU, 2012). The World Economic Forum 2013 Network Readiness Index (NRI) now ranks South Africa ranks 70th in the world, down from 34th in 2004.

The total number of Internet users in South Africa is still only around 34% of the adult population (Census 2012 and RIA 2012 ICT Access and Use Survey). Fixed-broadband penetration is particularly low in South Africa, and South African enterprises that depend on stable, high-speed broadband identify broadband as a major input cost in their businesses. Affordability and quality are critical factors in generating faster diffusion of internet use.

An unintended outcome of two decades of reform of the telecommunication sector in South Africa, including the absence of effectively regulated competitive markets, is the high cost of communications in the country<sup>1</sup>. This is constraining not only the realisation of the primary policy objective of affordable access to the full range of communication services, but also the optimal use of ICTs by individuals and enterprises to improve their wellbeing. Communications costs also continue to represent a significant input cost for business with the attendant negative consequences for the growth, development and global competitiveness of our enterprises. These cost levels have constrained investment in South Africa as a regional business hub and particularly investment in large-scale business process outsourcing and similar job-creating industries.

Despite recent reductions to both fixed and mobile data prices, broadband pricing remains a barrier to the exponential growth in broadband required for South Africa to ensure that broadband has the required social and economic impact.

The increased availability and reduced cost of international bandwidth that resulted from the end of SAT 3 monopoly and the landing of multiple undersea cables since 2009, together with the take-off of mobile broadband, has massively increased demand for data services.

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<sup>1</sup> WEF Global IT Report – South Africa ranks number 117, 89 and 118 out of 144 countries for Mobile cellular tariffs, Fixed broadband Internet tariffs and Internet & telephony competition.

With increased access to the Internet, particularly through wireless broadband devices, the critical infrastructure constraint is no longer international bandwidth, but the development of terrestrial networks and a fine-grained high capacity access network in particular. Historically dimensioned for low-bandwidth voice services, the current capacity of these networks is strained, in both the access and the backhaul networks. Delays in the allocation of high-demand spectrum to roll out the next generation (4G) networks creates a severe constraint on operators' ability to meet demand and improve broadband uptake in the access networks.

Institutional challenges associated with spectrum allocation, together with delays in the migration of analogue terrestrial broadcasting to digital, have meant that service innovation, increased competition, potential job opportunities and tax revenues have not been realised. The efficient assignment and subsequent use of spectrum to meet this demand is vital and the cost of not doing so high.

Pressure on backhaul networks and the high associated cost of leasing facilities from the incumbent operator, together with delays in the licensing of the build-out of the state owned broadband company Infracore, prompted other operators to build their own intercity high-speed networks. Numerous other companies are now also laying fibre networks and selling capacity, as are municipalities. While this has resulted in improved broadband capacity in metropolitan areas and even in choice and reduction of wholesale level, vast parts of the country remain unconnected.

If South Africa is to create the conditions for large-scale investment in networks capable of dealing with the demand for stable, high-speed broadband, major policy challenges remain.

Such investments will require more capital and technical capacity than government alone can be expected to provide. Through this policy, the South African Government wishes to address past failures in this regard, through credible commitments and the development of a predictable regulatory environment create an environment conducive to investment. However, raising capital is not the only problem.

The key to leveraging the benefits of broadband lies in the governance of the sector and in the ability of the state to co-ordinate activities across ICT ecosystem. The challenge herein is the development of strategies that enable the country to deal effectively with: the cross-cutting nature of ICT; the co-ordination of activities across different sectors, state-owned

entities and tiers of government, and the creation of institutional capacity to regulate the sector effectively.

The development of an integrated information infrastructure is one part of this and requires a clear delivery strategy that includes: enabling efficient supply through encouraging investment; adopting open access systems; enabling competitive infrastructure sharing; stimulating demand through interdepartmental co-ordination in the areas of skills development, and e-literacy; incentivising low entry-level prices for devices and services; local content development; and innovation and participation. It is the intention of this broadband policy to ensure that, in the interim, some of the policy and regulatory bottlenecks impeding the implementation of such access networks are cleared.

### **3. National Policy Context**

The South Africa's National Development Plan (2012) provides a vision of the ICT sector as one which by 2030 will "underpin the development of a dynamic and connected information society and a vibrant knowledge economy that is more inclusive and prosperous. A seamless information infrastructure will be universally available and accessible and will meet the needs of citizens, business and the public sector, providing access to the creation and consumption of a wide range of converged services required for effective economic and social participation – at a cost and quality at least equal to South Africa's main economic peers and competitors."

The NDP, together the New Growth Path, the national 5-year economic plan for the country, identifies the knowledge economy– an economy that is underpinned by access to affordable high speed broadband (Department of Economic Development, 2011) as one of the job creation drivers. In December 2012, the Presidential Infrastructure Coordinating Commission (PICC) launched Strategic Integrated Project (SIP) 15: Expanding Access to Communication Technology. SIP 15 aims "to ensure universal service and access to reliable, affordable and secure broadband services by all South Africans, prioritising rural and under-served areas and stimulating economic growth (PICC, 2012).

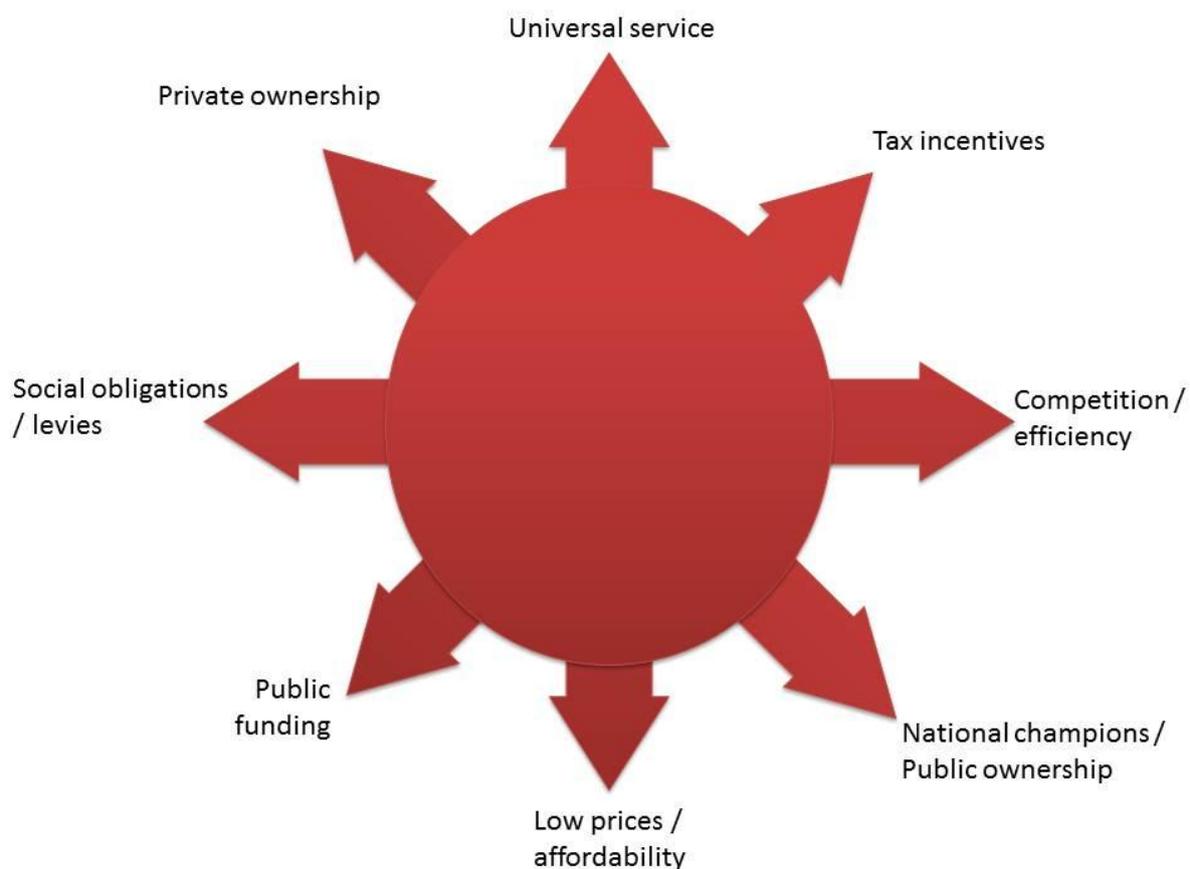
SIP 15 includes prioritisation of national migration from analogue to digital transmission of terrestrial television broadcasting by June 2015, and the expansion of access to communication technology through broadband infrastructure roll-out: "To this end, a national backbone infrastructure will be established which will inter alia include establishing core Points of Presence (POPs) in district municipalities, extending fibre networks across

provinces linking districts and, rural and under-served areas” (PICC, 2012). SIP 15 emphasises the need for “coordination and integration of communications infrastructure activities within state-owned enterprises, private entities, provinces and local government” as being critical and this policy seeks to support and provide clarity to the sector and coordinate the disparate broadband initiatives within the country.

Optimal growth in this sector will however only take place with policies, market structures, regulation, institutional arrangements, education and financing arrangements that are conducive to driving increased supply and demand. For this reason the Department of Communication is undertaking a comprehensive ICT policy review with the purpose of developing a comprehensive e-strategy as proposed in the National Development Plan. In line with this, this broadband policy adopts an integrated and cross-cutting, but citizen-centric approach to ICT policy-making that leverages the linkages in the ICT ecosystem (as indicated in the figure below) in order to create, a more equitable knowledge economy and information society.

## **2.1 Policy tensions**

The development of policies to address these gaps will also need to overcome some inherent tensions in the objectives.



**Figure 2: Tensions between key policy objectives.**

The central objectives that have formed the common core of policy towards South Africa's infrastructure sectors may be summarised as:

- accelerated sector growth and modernisation;
- the achievement of universal service/access;
- promotion of economic efficiency; and
- black economic empowerment (BEE).

The principal policy means that have over the past two decades been (and continue to be) directed towards the achievement of these objectives have been:

- market reform/liberalisation;
- state owned enterprise (SOE) restructuring and privatisation
- the universal service funding mechanisms; and
- promotion of foreign direct investment (FDI).

Within the telecommunications sector this has had mixed outcomes. As broadcasting and telecommunication, fixed and mobile, increasingly converge, with services being offered across historically distinct platforms, infrastructure in these sectors can no longer be planned in isolation from each other or from the services riding on top of them. The policy decisions that follow identifies new ways of delivering on national objectives, managing such the tensions and overcoming the structural problems that have resulted in poor broadband outcomes in an enabling context that includes both incentives and obligations.

#### **4. Purpose**

Drawing on the submissions made in response to the public consultation notice in the Government Gazette 350 of 2013 published in March this year, the purpose of this policy is to outline a vision and long-term strategy that can be immediately instituted, to catalyse broadband connectivity in South Africa, with the objective of creating a dynamic high-speed information infrastructure to meet the needs of the South African citizens in a modern economy and information society. In doing so it also outlines a plan that can be instituted in the short term and identifies the national departments and agencies responsible for setting the plan in motion.

Specifically, the purpose of South Africa Connect is to:

- provide a broadband vision and a roadmap to get there in ways that enable economic enterprise and innovation and ensure social and economic inclusion;
- identify a strategy that will deliver a robust and cost effective broadband solution to universal, affordable broadband access;
- provide a model for the development of a world class open-access national broadband network through the harnessing public and private sector contributions,
- identify the market structure and associated regulatory regime required to induce sufficient public and private investment in broadband extension;
- indicate the mechanisms for create a framework for greater co-ordination at all tiers of government, to enable more equitable access to broadband and to manage the removal of impediments to broadband network extension;

- ensure better co-ordination between state owned companies and implementing agencies through clear role definition, integration of planning, monitoring and evaluation and development of institutional capabilities;
- remove the policy constraints, regulatory bottlenecks and other hurdles that have constrained the diffusion of broadband, inhibited economic growth and led to South Africa's poor ratings in global indices;
- create mechanisms for the planning and integration of infrastructure through the mapping of existing broadband networks, co-ordination of deployment plans of operators in order to limit the duplication of civil works and enable infrastructure sharing; and
- identify areas and methods of demand stimulation to ensure equitable and optimal use of broadband by all, including instruments to support the production of relevant content and design and development of applications.

## **5. Objectives**

The arising objectives for South Africa therefore are:

- affordable, ubiquitous broadband to meet the diverse needs of public and private users, formal and informal sector business, and consumers and citizens;
- policy and regulator conditions that enable public and private sector players to invest in and in other ways contribute to reaching South Africa's broadband ambition exist;
- efficient public sector delivery, including e-government services, underpinned by the aggregation of broadband needs demand to drive economies of scale and which ensure that all public institutions at the national, provincial and municipal level have broadband connectivity and this is extended to the communities they serve;
- public and private enterprise, formal and informal, are able to fully exploit the efficiencies offered by ubiquitous broadband and its potential for innovation;
- a strong national skills base is developed for the country to be a proficient and globally competitive knowledge economy;

- a vibrant creative and software industry producing content and applications relevant to meet the needs of the diverse users in the country flourishes; and
- citizens and consumers have the literacy and skills to access services and content, including public information and public services.

## 6. Principles

Recognising that broadband is an evolving phenomenon with constantly changing and expanding demands; and in order to create enabling conditions for an advanced, universally accessible information infrastructure that promotes social and economic inclusion, South African Connect is informed by the following guiding principles:

- **Openness:** at the infrastructure level, with open access for multiple services providers who are enabled to compete on shared platforms; and at the level of government and its regulatory agencies, commitment to open governance and open data;
- **Service and technological neutrality:** not giving preference to any particular type of service or technology, while ensuring the use of common standards and protocols that enable interoperability;
- **Universality:** universal access to broadband services through more even provisioning of services, including a focus on services in unserved and underserved areas and communities;
- **Equality:** address the digital divides between those with the resources and capabilities to access and optimally use the full range of broadband services and the who are marginalised from services;
- **Inclusion:** ensure that there is not only equity in access but also in the capabilities to enable the more equitable use and production of broadband services, applications and content;
- **Collaboration:** Public and private sector collaboration to optimally leverage existing infrastructure for development of broadband;
- **Competition:** service and platform competition to drive innovation and lower costs;

- **Efficiency:** Within a competitive market, enabling the sharing of infrastructure to avoid unnecessary duplication;
- **Co-ordination:** by the state, across all tiers of government and across relevant sectors;
- **Transparency and accountability:** by sector institutions and operators, policy and regulatory certainty to enable public and private investment;
- **Innovation:** creating conditions for innovation throughout the ICT ecosystem from policy and regulation to services and applications, and from networks to users and skills and capacity building;
- **Complementarity:** leveraging top-down coordination and bottom-up initiatives, public and private resources, fixed and wireless technologies, and different tiers of government; and
- **Future-proof:** ensuring that policy choices are flexible enough to accommodate technological progress, neutral enough to withstand technology and market shifts and resilient to value dilution.

## 7. Vision

*The vision for broadband is that by 2020, 100% of South Africans will have access to broadband services at 2.5% or less of the average monthly income for South Africans. (Vision 2020, Department of Communication).*

This is underpinned by South Africa's National Development Plan (2012) which at the core of its vision for the ICT sector by 2030 is a widespread broadband communication system ecosystem of digital networks, services, applications, content and devices, firmly integrated in the economic and social fabric of the country, which will connect public administration to the active citizen; promote economic growth, development and competitiveness; drive the creation of decent work; underpin nation-building and strengthen social cohesion; and support local, national and regional integration (NDP 2012)."

## 8. Definition

Many earlier broadband policies drew on definitions based on bandwidth and speed, and initially on the minimum speeds set by the International Telecommunications Union, but from a policy point of view this has limitations. The needs of countries are quite different, and standard minimum speeds rapidly become out of date with technological advances.

In line with the growing trends towards defining broadband rather in terms of functionality in South Africa broadband refers to:

*An ecosystem of high capacity, high speed and high quality electronic networks, services, applications and content that enhances the variety, utility and value of information and communication for different types of users.*

This definition should be read together with the associated reviewable broadband targets set out below relating to bandwidth and penetration

### 8.1 Targets

These targets are above many of the easily, or already achievable, official ITU technical speeds to qualify as broadband, and below some of the very high targets recently set in some broadband plans on the continent. The problem is that if they are set very high, they remain aspirational targets that cannot realistically be met and therefore cannot reasonably be used for planning purposes. And, as indicated, if they are very low, user experiences already exceeds them.

Target	Penetration measure	Baseline (2013)	By 2015	By 2020	By 2030
Broadband access in Mbps user experience	% of population	33.7% <sup>2</sup> Internet access	50% at 5Mbps	100% at 5Mbps 50% at 100Mbps	100% at 10Mbps 80% at 100Mbps
Schools	% of schools		100% at 10 Mbps	100% at 100Mbps	100% at 1Gbps
Health facilities	% of health facilities		100% at 10Mbps	100% at 100Mbps	100% at 1Gbps
Government facilities	% of government offices		50% at 5Mbps	100% at 10Mbps	100% at 100Mbps

<sup>2</sup> Research ICT Africa, 2012 ICT Access and Use Survey.

These minimum targets will be periodically supplemented by ICASA, whose mandate requires it to ensure quality of service. Advertised speeds are however seldom the speeds experienced by end users and this makes assessment of compliance problematic. ICASA will in addition to pricing, need to regulate quality of service which may include download and upload speeds and latency, together with waiting time for installation and fault clearance.

	Issue	Action
<b>Targets</b>	Currently low penetration, high prices, poor quality of service	<ul style="list-style-type: none"> <li>• ICASA to review targets periodically and monitor compliance</li> </ul>

## 9. Gap analysis

This section identifies a number of key broadband policy areas to assess the shortfall between current status of the broadband ecosystem in the country expounded in the problem statement and the broadband vision for the country

**Infrastructure reach:** This refers to the extent of the physical infrastructure and can be assessed in terms of the percentage of the population reached or the geographical coverage of the country.

Because South Africa is highly urbanised, large concentrations of the population are in reach of wireless broadband services, if not fixed. "Reach" does not refer to the affordability of the services or whether people have the skills set to utilise services, which aspects are discussed further later in the document.

The gap in high capacity backbone infrastructure is greatest in rural areas and in particular in former homelands. There are also some urban areas with high population densities that remain unserved. Nonetheless, other than in some parts of KwaZulu Natal, North West and Eastern Cape, fibre backbone coverage reaches to within 12km of most communities.

However, the real gap is in the last-mile or local loop infrastructure. In high demand metropolitan areas there is considerable duplication of infrastructure, but outside these areas, ADSL is limited: failure to release spectrum and the cost of building out high speed next generation networks to low demand areas, mean that the substitution of mobile broadband for ADSL is not as prevalent as it is in metropolitan areas.

**Infrastructure availability and cost:** The high prices charged for communications services are identified as one of the primary factors hampering South Africa's competitiveness.<sup>3</sup>

The lack of effective regulation of wholesale markets and the failure to provide incentives to operators to share infrastructure means that wholesale broadband has not been as widely accessed by the competitive services segment of the market has not flourished. While there is some vigorous competition among mobile operators in the sale of retail mobile data, and some resale by some of the larger ISPs, there is not significant scope for price competition without serious wholesale access regulation, and service providers tend to focus as a result on their valued added services to compete.

Competition in international bandwidth has brought down the cost significantly, but this has not all been passed through to end users - terrestrial network charges and IP transit charges remain high and, as yet, are not regulated.

In the fixed market Telkom is the sole provider of ADSL lines, though again there is some resale by internet service providers. Whilst prices have come down, they remain high by global standards. As a result South Africa only has 800 000 ADSL subscribers; a very low rates for a lower middle-income country. Despite the fact that limited penetration of fixed line copper networks constrains the availability of ADSL in all part of the country, over 1,2 million ADSL lines lie fallow.

**Spectrum:** With wireless as the major driver of individual broadband uptake in South Africa, the release of critical spectrum from the migration of analogue terrestrial broadcast services in the 700MHz and 800MHz bands to digital terrestrial broadcasting has been a major area of industry pressure. Licensees consider this failure to assign this spectrum as the critical policy and regulatory bottleneck inhibiting broadband uptake.

Deployment of high-speed wireless broadband services using 4G technologies is seen as crucial to delivering next-generation broadband services to South Africans and to overcoming the so-called "digital divide" between connected urban citizens and those living in rural areas.

Failure to allocate existing available high demand spectrum and delays to the migration from analogue to digital and therefore to the timing of spectrum availability for mobile communications is perceived as a major policy and regulatory bottleneck.

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<sup>3</sup> World Economic Forum Global Information Technology Report

**Funding:** Funding requirements for the effective roll-out of broadband are beyond the capacity of either the government or the private sector alone. What is required are new innovative ways that blend private and government funding sources to fund not only infrastructure roll-out, but also critical content development and the provision of public services online.

Besides the generally poor outcomes of the universal access strategies of the past two decades, the scale of funding derived from the Universal Service and Access Fund (USAF) and indirectly through Universal Service and Access Obligations (USOs) is inadequate for scale of funding required for the task at hand.

It is clear that significant incremental government funding needs to be allocated for these initiatives. New funding models are required to share investment risk between the public and private sector, as the burden for funding cannot be carried by government or private sector alone.

Indirect funding arrangements such as through the aggregation of public sector demand for the purposes of co-ordinated and bulk procurement, will be implemented to contribute to funding of broadband projects and this can potentially be turned into anchor tenancy on the open access broadband network which will assist with network investment.

**Uptake and Usage:** The high cost of services on the supply side and the low levels computer and e-literacy on the demand side together with the low levels of advanced technical skills, of R&D and innovation and of application and service development, and the lack of government uptake of digital services currently inhibit the diffusion of broadband. These factors also inhibit the attractiveness of the market, and the realisation of entrepreneurial and innovation potential associated with the availability of high-speed broadband.

An audit will be undertaken of existing initiatives addressing this problem, together with a comprehensive gap analysis to assess the needs and costs associated with addressing them.

The gap in content and applications development will be addressed through alignment of proposed mechanisms with existing and proposed funds and agencies intended for this purpose.

In recognition of the potential benefits of schools networking, South Africa has had intentions to connect all school for more than a decade. However, past measures, including licence obligations, have failed.

**Market structure and regulatory regime:** Despite the horizontal licensing regime currently the market is structured around vertically integrated incumbents who compete downstream with multiple service providers.

Telkom has by far the largest backbone in the country. Infracore, despite its mandate to address the broadband deficit in the country and Neotel, the second network operator licensed to compete with Telkom, trail significantly behind. In the retail market Telkom dominates the fixed broadband market, though the mobile incumbents MTN and Vodacom are now considerably larger than any of the other broadband players.

The data market has not been as effectively regulated as voice and the issues of wholesale access to fixed and mobile networks by competitors is a key issue in creating sufficient competition in data services to drive down prices.

National policy is intended to create the conditions for the regulator to induce investment in the sector, enable competition, create awareness of services ensure positive consumer welfare outcomes.

In South Africa few of these policy outcomes have been realised over the last two decade of telecom reform. Instead, the sector has been plagued by institutional failure in all agencies with delegated powers. The problems within the institutional arrangements relate to: the appointment process, funding, limitations on the autonomy of institutions and to the mechanisms to enforce the transparency and accountability of institutional decision-making.

The primary gap in this regard is that the regulator has had neither the capacity nor the funding to undertake the critical task of regulating the highly imperfect markets that have emerged. Regulatory bottlenecks are hampering both expansion of the sector and fairness of competition and therefore the welfare of consumers.

These problems are even more compounded in the Universal Service and Access Agency of South Africa (USSASA) and the Universal Service and Access Fund (USAF).

**Trust, Security and Privacy:** As broadband services and applications extend into every aspect of our lives, greater numbers of individuals are shopping, using government services and interacting socially online.

While South Africa has long been aware of the need for cyber security, existing law, in the form of the Electronic Communications Transactions Act, is over a decade old and needs to be aligned with this rapidly changing digital world, in order to provide users with confidence to use services and products and thereby stimulate broadband use.

Such updated laws also need to be aligned with global developments and the efforts of agencies working in this area, and a key aspect is the creation of a secure digital environment which safeguards the privacy of users and protects their data and its use in the increasingly vast databases which now underpin mainstream electronic services. Whilst current Protection of Private Information (POPI) legislation goes a long way to protect private information, a review is needed to determine the need for consolidation and to identify any gaps arising from particular local needs and global trends.

**Data, Information and Indicators & Analysis:** The poor quality of official information and data on which many international studies are based, and on which national government and the regulator are dependent, severely limits a commitment to evidence-based policy.

While South Africa's poor performance in global and continental indices are indicative of South Africa's declining global position, the underpinning data are incomplete and lacking. This is a result of South Africa not submitting official indicators to the ITU, which data also informs various other indices such as those of the WEF and the World Bank. In order to set targets, make use of benchmarks, and monitor and evaluate policy outcomes, it is imperative that decision-makers have accurate and current data.

With regulators in most countries (and in South Africa) having the powers to demand data from licensees (and guarantee the necessary confidentiality), the ITU anticipates that the regulator collects the data for the standard indicators, though the SA government is the official member under the UN system.

Together with StatsSA, DOC and ICASA have sought to develop a national ICT indicator portal over the past year. However, the quality of information received from operators, has been mixed and as a result ICASA has not been able to submit complete datasets to UN agencies, nor comprehensively populate the official portal.

**Regional integration:** This policy seeks to address some of the gaps between status of regional integration currently and the vision to achieve a 'Digital SADC' by 2027 which acknowledges that the key benefits from becoming a knowledge-based society are based on

the provision of always-on affordable broadband connectivity delivering relevant content and useful applications by means of easy to use access devices.

Making sure this happens by 2027 will require rapid and concerted efforts by all. This policy supports the framework for this which is based on the two platforms: **ICT Policy and Regulatory Harmonisation** and **Confidence and Security of Networks and Services Infrastructure**; on which four pillars stand - infrastructure, E-services & applications; Research, innovation & industry development; and Capacity building and content.

The plan arising from this policy will also consolidate regional telecommunications networks to ensure that the region is fully interconnected nationally, regionally, inter-regionally and globally, through reliable and affordable fibre optic links. Every capital city in the Region is to be linked to all of its neighbours via at least two routes, and to at least two different cross-continental submarine networks. Affordable satellite based connectivity solution is available for remote areas outside the near-term reach of fibre infrastructure.

**Human development, skills:** There is now considerable evidence to demonstrate that inequality of access and use of ICTs and therefore in the ability to deploy their full potential is rooted in the unequal capabilities of individuals and groups, such as women, those living in rural areas, persons with disabilities, and the elderly.

As the optimising of ICT becomes more complex, the ability to optimise their use correlates strongly with education and income. Those marginalised from education and therefore employment and income are most likely to be marginalised from access to the type of communications services required to participate meaningfully in a modern economy and society. Therefore, strategies for inclusion in the information society and knowledge economy need to be central to national human development strategies. This needs to become a national priority and a core element of the national project of digital inclusion.

Perhaps the greatest gap for South Africa is overcoming the human development and having the skills base necessary to operate a knowledge economy. South Africa now ranks only 121 on the UNDP Human Development Index, which measures improvements in health, education and living standards. The 2013 World Economic Forum (WEF) Global Information Technology Report 2013 ranks the quality of South Africa's education system as 140<sup>th</sup> of 144 countries and further, ranks our Maths and Science education as second last in the world, ahead only of Yemen. The challenge faced is further evidenced in South Africa's ranking for Internet Access in Schools of 111<sup>st</sup> of 143 countries.

This policy proposes ways to address this gap through the connection of schools and the introduction of ICT skills development in the school curriculum. This is the base required for to address the next gap, namely research, innovation and entrepreneurship.

**R&D, innovation and entrepreneurship:** Whilst South Africa's overall R&D spend has inched towards 1% of GDP, this is still significantly below what is required for economic competitiveness and to enable South Africa to produce a greater portion of broadband technology and services domestically, as envisaged in industrial policy goals.

The low spend on R&D means that South Africa, spending a quarter of what Brazil and Australia spend, has insufficient knowledge-generating capability to fuel a continuous stream of technological innovation. This, coupled with inadequate levels of entrepreneurship, means that South Africa is losing out on the socio-economic benefits that should accrue from R&D, innovation and entrepreneurship.

Pervasive and affordable broadband is likely to stimulate innovation in broadband applications and services. This needs to be accompanied by investments in the development of critical mass, ICT R&D capabilities, in innovation support measures and in advanced human capital development. South Africa's National ICT RDI Roadmap provides a plan and coordinating mechanism for public and private investment in ICT R&D and Innovation.

**Open Access:** Common to different practices around the world, open access refers to wholesale access to network infrastructure or services that is provided effectively on fair and reasonable terms, for which there is some degree of transparency and non-discrimination<sup>4</sup>.

While there is increasingly infrastructure sharing on a commercial basis as the economy tightens and operators seek efficiencies, the regulation of open access in order to improve competition in South Africa has been limited, beyond consideration of Local Loop Unbundling. Some of the access remedies that were available to regulators for traditional broadband may no longer be technically or economically viable on their own for broadband networks, as it is clear there will be insufficient infrastructure competition, especially outside very densely settled urban areas.

The intent of this policy is to provide a clearer framework for the implementation of an open access regime for the next generation access (NGA) networks planned for the country.

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<sup>4</sup> See OECD 2013, Stimulating Competition through Open Access Networks available at <http://oecdinsights.org/2013/03/05/stimulating-competition-through-open-access-networks/>

Bearing in mind that there is no single definition of “open access”, for the purposes of this policy it is considered as having application to fixed and mobile access networks, backhaul and backbone networks, undersea cables and Internet exchange points, (IXPs).

The scope for wholesale open access in fixed networks not only affects products and services such as access to the local loop or wholesale services at higher levels of the network (e.g. bitstream). Key access products, such as dark fibre services, access to ducts or, especially, access to in-building wiring, play a major role and are taken into account as they present a major barrier for the entry of alternative operators.

In recent years, obligations for mobile network operators (MNOs) to host mobile virtual network operators (MVNOs) has driven substantial changes in some markets where competition has been otherwise limited by a lack of access to competitive wholesale arrangements. Open access wireless networks should be able to address these market constraints more effectively.

Open access arrangements have also been used at the backhaul and backbone network levels, for example by municipal backhaul networks, undersea cables or wholesale backbone networks. These initiatives are mostly the result of public intervention and are usually triggered by a mismatch between public policy objectives and the current outcomes of market forces.

Internet exchange points (IXPs) were regarded as a sound example of open access arrangements, because an IXP typically allows its parties to exchange traffic, based on agreed terms and conditions, and usually has a clear and transparent policy to which members must adhere. They are usually run directly by industry participants, such as ISPs, who set their own policies and practices on a voluntary basis and under mutually beneficial terms and conditions that are open for others to join, upon adherence to these rules. However, the terms under which ISPs of different sizes can peer or transit has become increasingly discriminatory and there may be a regulatory gap and need to mandate open access.

## **10. Current status of broadband infrastructure networks**

In the absence of a clear umbrella policy for broadband, various public and private broadband networks have evolved in South Africa over the last decade.

Policy interventions for enhancing broadband access need to start by taking into account the reach, availability and affordability of the different elements that make up the national broadband landscape. Without such analysis, there is risk that simplistic solutions may be chosen that do not address the root cause for South Africa's lag in deploying broadband.

The current status of the different network elements in South Africa differs dramatically and the dynamics that have led to the current state therefore require different remedies. The national broadband infrastructure value chain can be understood as consisting of the following elements, all of which require supply side strategies to ensure co-ordination and integration:

- International connectivity, provided via under-seas cables;
- Domestic backbone, long distance fibre optic links, including regional (rural) district extensions;
- Metropolitan networks;
- Local access networks; and
- On-site (LAN) connectivity and devices.

**International connectivity:** Until 2009, South Africa was connected to the rest of the world via a single international submarine cable, SAT3. As of 2013, four submarine cables provide a combined capacity of 11,5 terabits per second of international connectivity, available on a wholesale basis from at least 5 providers. Additional cables that are under construction will bring the total capacity to 29,5 terabits per second.

Since the introduction of cable competition in 2009, prices have dropped dramatically, driving demand and resulting in better use of available capacity. Despite this, there is still considerable capacity available to meet immediate future needs. These undersea cables connect South Africa with Europe and Asia, as well as with other African countries through the various landing points on the east and west coast of the continent. In addition, South Africa is connected to neighbouring countries through cross-border networks.

**Domestic backbone or National Long Distance Network:** Long distance "inter-city" fibre-optic connectivity is provided by a number of private sector and state-owned enterprises.

Of these, Telkom's network is the most extensive, connecting virtually every city and town. This is followed by the Broadband InfraCo, which operates a significant national network covering major national routes. These are complemented by additional networks on high-demand routes between Johannesburg, Cape Town and Durban (NLD and DFA), and by fibre networks between Johannesburg and East London (FibreCo) and between Pretoria and Musina (Liquid Telecom).

An extensive long distance fibre network exists in South Africa, to the extent that approximately 86% of the South African population is within 10km of access to fibre. There are concerns that some long haul fibre may not be sufficient to cater for future demands.

Whereas competition on the major national routes has contributed to price reductions, limited competition exists on other routes and the cost to connect remote locations remains high.

Neither the Telkom nor the Broadband InfraCo networks are currently available on an open access basis. The current private sector NLD projects may have elements of open access but do not presently address demand beyond the main centres. A key part of this is the **Regional (rural) district extensions:** Rural networks exist in large parts of South Africa, but as a consequence of the spatial legacy of Apartheid, limited infrastructure exists in the former homelands and other historically disadvantaged areas.

**Metropolitan area networks:** Most municipal areas have considerable core network infrastructure, dominated by Telkom's network infrastructure developed over many years. The relatively new entrant, Dark Fibre Africa (DFA) has built nearly 8000km of metro ducts and fibre in all major metros and a number of secondary cities providing open access dark fibre on a wholesale basis. In addition, many municipalities have built their own municipal fibre networks to serve the needs of local government.

As in the case of longer distance networks, this metropolitan area infrastructure reflects South Africa's unequal spatial development, with limited network infrastructure in townships. A lack of coordination between operators in metropolitan areas and agreed models for making municipal networks available for wider purposes limits the potential of some metropolitan infrastructure to contribute to South Africa's broadband ambition

The last 10 years have seen a proliferation of network initiatives led by various Provinces, Metros and Municipalities. Local government has invested significantly in broadband

infrastructure roll-out during this period and there are a number of successful projects and initiatives.

This drive by local and provincial government has resulted in two undesirable unintended consequences. The first is the proliferation of projects in an uncoordinated manner and the duplication of effort and networks and the possible wasting of resources and the second unintended consequence has been the conflict that has arisen between municipalities with vested interests in their own infrastructure projects and the shutting out or hampering by officials of normal private sector infrastructure deployment in those areas. The PICC through SIP 15 will ensure greater coordination of provincial and local government broadband infrastructure initiatives and harmonisation with the NBN.

However, local authorities play an important role in creating an enabling environment for broadband, through provision of wayleaves and other approvals. Currently municipalities' capability and practice in this regard is uneven, but there have been some notable successes, from which key lessons can be derived.

**Access networks:** In South Africa the biggest gap in the national broadband infrastructure is currently in the access network, illustrated by the fact that 86% of the population is within 10km from a fibre access point. Broadband access is provided via mobile, fixed wireless, ADSL and, to a very limited scale, by fibre to the premises (FTTP).

Of the access mechanisms, mobile coverage is the most extensive, but mobile broadband access is limited to lucrative urban areas and data costs are relatively high. Extending broadband access is dependent on allocation of high demand spectrum. It is also dependant on higher tower density, which requires additional investments by mobile operators.

ADSL connectivity is only provided by the former incumbent, Telkom, with only 800 000 subscribers. Although a large number of internet service providers can provide internet services over ADSL, their ability to differentiate their offerings and service levels is limited by that fact that there are only three points of interconnect on the Telkom network, which effectively makes them entirely dependent on Telkom for domestic networking.

- Fixed wireless - Fixed wireless in limited areas.
- FTTP - Negligible fibre reach, high cost
- Access is mostly just retail focussed.
- On-site (LAN) connectivity and devices

- Compelling global trends show increasing pressure on operators to better share infrastructure. An open access wholesale wireless network presents a viable way of enabling this. This trend could be leveraged in support of the National Broadband Network.

**On-site (LAN) connectivity and devices** – Previously the cost of personal computers represented a significant barrier to access by individual users. The advent of low cost mass produced smart phones and tablets has however to a significant extent overcome this. Gaps that remain relate to:

- affordability of devices amongst a significant portion of the population;
- institutional absorption of such devices, for instance in schools; and
- inability of these devices to address all user requirements.

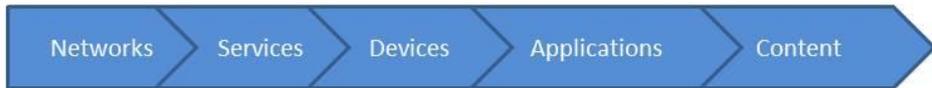
## **11. South Africa's Broadband Plan – closing the gap**

South Africa's broadband ambition will be realised through four complementary strategies:

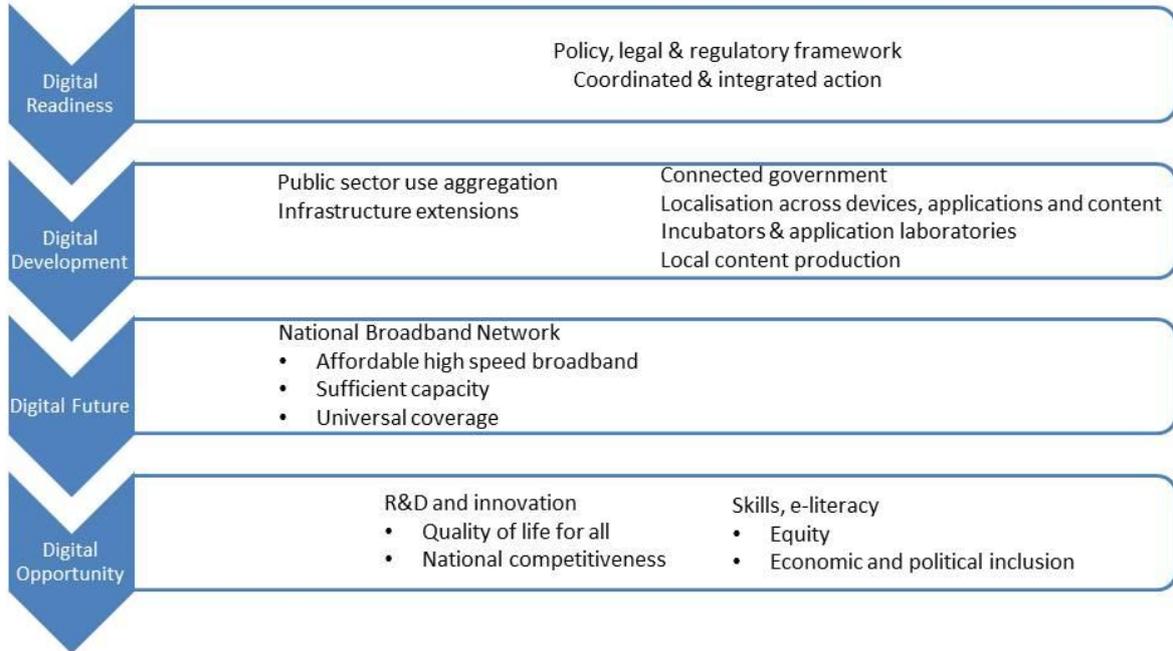
- **Digital readiness** - laying the foundations for South Africa's broadband future;
- **Digital development** - addressing needs and ensuring sustainable rollout;
- **Building the digital future** - roadmap for public and private investment in the next generation broadband networks; and
- **Realising Digital Opportunity** – ensuring that South Africa harnesses the benefit of broadband based on skills, R&D and innovation, entrepreneurship, and relevant content and applications.

These strategies are elaborated in the sections below.

### Broadband Value Chain



### Strategies



*Economic Growth, Development, Job Creation*

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## **12. Digital readiness - laying the foundations for South Africa's broadband future**

The creation of an enabling policy and regulatory environment is key to the successful outcome of this national project.

The current market structure and institutional arrangements that constrain the competitiveness of markets or their effective regulation will be identified and fast-tracked in the current ICT Policy Review process. As this process will not be complete until the end of 2014 and considering the urgent nature and backlog on concluding a national broadband plan, the Minister will propose legislative amendment where required to the institutional arrangement and issue policy directives where appropriate to remove policy bottlenecks.

**Market structure and arising regulatory regime:** Inherent monopoly elements in infrastructure industries, or the inability to duplicate network elements economically, mean that considerable barriers to market entry exist, rendering such markets inherently imperfect. Even where markets are liberalised and there are a number of competitors, the advantages of dominance or incumbency and the asymmetries this produces can prevent fair competitive outcomes. Regulation of this relationship under such circumstances has long been acknowledged as necessary for the creation of a fair competitive environment and to ensure consumer welfare. This is particularly necessary when there are high degrees of vertical integration in the market and upstream wholesalers compete with their downstream retail competitors, as is the case in both the fixed and increasingly in mobile markets in South Africa, where dozens of new licensees wish to have wholesale access to the mobile networks in order to sell on mobile services.

While these traditional supply side issues of interconnectivity, scarce resource allocation of numbers and spectrum, tariff regulation and quality of control remain and several particularly spectrum assignment, rights of way co-ordination and wholesale data access regulation, remain major bottlenecks in the South African market, to enable to broadband development regulators need now also to attend to demand side issues. As we increasingly move online, a key role for regulators is to ensure user trust and confidence that their rights and privacy are protection.

With this enhanced mandate it is vital that the factors that have limited the independence of the regulator to implement national and sector policy without political and operator interference or allegiance; allowed it to act capriciously and without the necessary accountability to the public and Parliament; that have resulted in its limited capacity,

competency and the lack of funding in order to perform its critical role in the development of this key sector of the economy and society must be swiftly addressed

One way of restructuring the market to ensure greater access by service providers to broadband and reducing costs associated with infrastructure duplication is through the consolidation of available networks into a public and privately funded national fibre and wireless broadband network that will operate on open access principles. This will create incentives for the upstream operator to open the network to as many service providers as possible to make the network profitable, thereby creating the conditions for fair service-based competition.

In many jurisdictions the primary vertically integrated incumbent has been used as the basis for such national broadband networks. To structurally prevent abuse of their dominance in the markets, their network has been separated from their services to create two separate companies. The wholesale network company is set up under terms which require it to provide access to all service providers. It is then disincentivised to keep service providers off its network if it is to be profitable and if it fails to bring down prices to attract as many customers as possible, these access prices may be regulated.

**Institutional capacity:** Requisite institutional capacity needs to be built, strengthened and where necessary streamlined in the Department of Communications, the portfolio organisations responsible for policy implementation, the responsible national department, and in complementary agencies outside of the communications sector.

**Enabling investment in infrastructure build:** Deployment of high-speed broadband networks requires an enabling environment that facilitates the coordinated building and sharing of infrastructure. The dominant cost (up to 80%) in deploying new networks relates to civil engineering works. Inefficiencies and bottlenecks preventing rollout therefore need to be addressed. Co-building of infrastructure should be enabled to avoid unnecessary duplication and measures instituted for the optimal leverage of existing infrastructure in the interests of enabling better utilisation, greater cost savings and healthy competition.

Specific measures envisaged to promote investment in infrastructure building are:

- **Efficient permit granting:** Responsible authorities will provide communications networks providers with a clear, simple, transparent and efficient mechanism for granting permits for civil works.

- **Access to and use of existing physical networking infrastructure:** ICASA will enforce regulation requiring network operators' obligation to meet all reasonable requests for access to infrastructure on a non-discriminatory basis to their physical infrastructure (such as ducts, conduits, manholes, cabinets, poles, masts, antennae, towers and other supporting constructions).
- **Coordination and exploiting synergies with other civil works:** Transparency of information on and mechanisms for accessing on a reasonable basis existing and planned public infrastructure suitable for hosting high-speed Internet such as electricity, water and sewage, transport infrastructures and high sites. Such sharing across different civil domains will also facilitate future smart cities and regions.

Transparency will assist in preventing accidental damage to water pipes or electricity and cables during construction of broadband infrastructure.<sup>5</sup>

- **Coordination of civil works:** Frameworks will be put in place facilitating coordination and cooperation of civil works amongst network operators.
- **In-building equipment:**
  - All newly-constructed buildings and buildings undergoing major renovation will be equipped with facilities, such as ducting for fibre optic cabling, for high-speed-ready in-building physical infrastructure, up to the network termination points from 2015.
  - Every Internet provider will have the right to terminate its network at a concentration point located inside or outside a building and will have the right to access any existing high-speed-ready in-building physical infrastructure on reasonable terms.

**Spectrum:** Spectrum is a scarce but non-depleting resource that has to be efficiently managed efficiently to optimise its potential to provide broadband access. This is especially pertinent given the dominance of mobile access in South Africa. Fixed wireless access also represents an alternative to fixed line networks to provide high capacity broadband especially in rural areas.

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<sup>5</sup> In Europe it estimated that reducing excavation-related damages to existing infrastructure could save up to €60 billion per year.

The immediate priorities are:

- the identification of unused spectrum and its reassignment;
- the removal of all bottlenecks preventing migration of terrestrial broadcasters from analogue to digital in order to realise the digital dividend,
- the urgent assignment of 800MHz and 2,6GHz spectrum, followed by the assignment of 700Mhz;
- enabling spectrum sharing between spectrum licensees and across services; and
- enabling dynamic spectrum allocation (as for example in TV White Spaces).

It is Government's objective to ensure that universal service and access to broadband for all is attained. Therefore, licensing of broadband spectrum should first and foremost seek to achieve the following national policy objectives in the public interest:

- achieving universal access to broadband;
- Support the viability of a national open access wholesale wireless network
- ensuring effective and efficient use of high demand spectrum;
- promoting open access principles;
- ensuring an optimal and sustainable level of competition; and
- ensuring that participating licensees contribute to the promotion of the empowerment of historically disadvantaged persons, with particular attention to the needs of women, opportunities for youth and challenges for people with disabilities.

Spectrum that is required in order to offer commercially licensed services will be assigned on the basis of fair market value and with regard to needs to public use spectrum, including safeguarding a spectrum commons for unlicensed use.

The creation of a national open access wireless network is planned as part of the strategy to meet national broadband requirements.

**Legal and regulatory framework:** The Department will undertake a review of all relevant legislation and regulation required to enable achievement of South Africa's broadband ambition. Particularly it will use the current raft of amendments the primary legislation of sector, specifically the Electronic Communications Act, 2005, the ICASA Act, 2000, the

Electronic Communications Transactions Act 2002. If and where required, legislation will be amended or new law developed.

Areas that require specific attention to create to stimulate demand and use of broadband services include:

- **Cyber-security framework:** need to create trust and safeguards: An effective and secure online experience is an important contributor to increased broadband uptake and usage by the general public. Security covers a span of issues from confidence in payment and authentication systems, confidence in the security of personal information; and the protection online of children, or less literate members of society.
- **Legal frameworks (cyberlaw):** enables the development and use of services and applications, creating trust and confidence in online communication, business, trade and protection of individual rights, privacy. Specific legislation ECA, ECTA, POPI Bill (amendments)
- **Other law:** Cross-cutting legislation and processes relevant to process: ICT policy review - institutional arrangements - sector regulator; universal access/service delivery mechanisms/institutions

**Analysis, Information and indicators** – The following measures will be taken to address the shortcomings in analysis, information and indicators:

- ICASA is required to streamline information reporting, regulate required reporting formats and ensure compliance to avoid delays and remove regulatory bottlenecks, and to update a public information and indicators on the national portal regularly complying with international data requests comprehensively and timeously so that South Africa complies with UN and other international treaty organisation information requirements, to avoid information delays causing regulatory bottlenecks and so that the Department can formulate evidence-based policy.
- The Department of Communications will together with ICASA identify and budget for the regular collection of the necessary supply and demand side data required for effective policy formulation and regulation and will co-ordinate with StatsSA on the regular production of the national ICT satellite account. DOC will ensure that collaborating agencies display all public information on the national indicator portal.

With this common basis and a commitment to rectifying the information asymmetries between the operators and the regulator and Department and in order to address the general information deficit in the sector, two issues arise. One relates to broader national and sectoral issues that require better state co-ordination to introduce efficiencies in the sector and the other relates to more to competitive issues, which will be dealt with first.

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**Table 1: Digital Readiness - Policy decisions**

Issue	Action
<p><b>Market Structure</b> Vertically integrated incumbents hindering fair competition</p>	<ul style="list-style-type: none"> <li>• Initiate processes to establish open access national fibre and wireless broadband network consortia.</li> </ul>
<p><b>Institutional arrangements</b> Appointment process, funding arrangements, institutional design, capabilities and competencies produced negative outcomes</p>	<ul style="list-style-type: none"> <li>• Urgent review of the regulator and universal service agency governance structure, leadership appointment process and funding arrangement to ensure requisite capability to regulate:               <ul style="list-style-type: none"> <li>• open access</li> <li>• spectrum</li> <li>• competition</li> </ul> </li> </ul>
<p><b>Enabling infrastructure build</b> Hurdles and bottlenecks hampering broadband rollout</p>	<ul style="list-style-type: none"> <li>• Authority for enforcement of Rapid Deployment Guidelines to be included in Infrastructure Development Bill</li> <li>• DoC to engage with DEA on the development of a Strategic Environmental Impact Assessment for broadband infrastructure</li> </ul>
<p><b>Spectrum</b> Failure to allocate high demand spectrum</p>	<ul style="list-style-type: none"> <li>• Ministry issues policy directive within month of this notice and ICASA issues regulations by end of 2013 and assigns spectrum by first quarter 2014.</li> </ul>
<p><b>Legal and regulatory framework</b> Potential shortcomings in legislative support for Broadband policy</p>	<ul style="list-style-type: none"> <li>• The Department will undertake a review of all relevant legislation and regulation required to enable implementation of this policy</li> </ul>
<p><b>Analysis, Information and indicators</b>  Absence of indicators to inform national decision making and inadequate reporting to UN and other multilateral agencies</p>	<ul style="list-style-type: none"> <li>• ICASA to prepare information reporting regulations to ensure collection of ITU universal indicators;</li> <li>• DoC to work with Stats SA on regular production of ICT satellite account from the national accounts to assess contribution of sector to national economy; and</li> <li>• DOC to budget for and manage demand survey to comply with UN commitments to Measuring the Information Society.</li> </ul>

### 13. Digital development - addressing needs and ensuring sustainable rollout

To enable government administration, government to citizen interaction and electronic service delivery (e-government), to digitally enable key social functions such as education

and health as well as to support of emerging smart city requirements, Government will invest in broadband infrastructure through aggregation of public sector demand and procurement of high capacity networks. This will result in substantial efficiencies allowing the procurement of high capacity network services at the same or reduced cost. Through this aggregated government demand, sustainable business cases will be enabled for network operators by government serving as an anchor tenant on their networks.

This model, which is well established for national research and education networks (NRENs), has significant advantages over other approaches such as single source contracts in that it enables competition amongst network players and allows procurement of fit-for-purpose network components from different network providers<sup>6</sup>. Ultimately, this aggregated public demand will serve as an anchor tenant in the open access national broadband network, described in section 14, to guarantee significant demand for investors and thereby enhance the viability of the network.

To realise the benefit of aggregated demand requires coordination of network procurement across government sectors and tiers. The requirements for the different types of government networking outlined above are related but are sufficiently different that a one-size-fits-all approach will not be optimal. Therefore, the network architecture for this government network will provide for distinct sub-networks within the overall network.

The network requirements that will be served as part of the digital development strategy of this policy are:

- An expanded public sector network that will provide high speed broadband connectivity to administrative sites and other facilities;
- A Schools Network, connecting all schools and used by teachers, learners, school administrators and other support staff for administrative and teaching and learning purposes, is aimed at harnessing the vast potential that broadband has to:
  - extend access to educational opportunities regardless of gender, geographic location, socio-economic or ethnic background, illness or disability, or any other circumstance that would normally hinder the provision;

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<sup>6</sup> The South African National Research and Education Network (SANREN) connects all universities, science councils and national research facilities in South Africa at speeds of up to 10Gbps. The network is built on fit for purpose network components provided by four of the major fixed-line network providers in South Africa.

- enable flexible, open learning environments which enable contextual, real-time, interactive and personalised learning;
  - extend learning beyond the formal school environment enabling learning beyond traditional classrooms;
  - make education systems more efficient by helping teachers and administrators streamline routine tasks and improve assessment and data collection;
- A health network connecting all public health care facilities is not only a requirement for implementation of the National Health Insurance but will generate efficiencies such as faster patient diagnoses, reduced medical errors, etc.

Greater digitisation of the health care system enabled by broadband will improve the resilience of the health care system through its virtualisation ability and reduce the pressure on physical health facilities and personnel by keeping people out of hospital and by reducing the time they are there when that is required. Broadband will also enable equity in health care provision by enabling access to scarce expertise in rural areas.

- Community networks targeting underserved areas and disadvantaged populations to enable Internet use by the poor and marginalised;
- Free Public WiFi will be made available at all public points reached by the government networks. This will to enable citizens to access the Internet, including government services and thereby stimulate demand.

In rolling out these networks, due cognisance will be given to the mandate and authority of different spheres of government as well as the initiative that some provinces and municipalities have taken in establishing provincial and municipal networks. These national initiatives will therefore be coordinated with the initiatives at provincial and local level. The roll out of infrastructure by local and provincial government will be supported as a means of stimulating “bottom-up” infrastructure development, subject to coordination with the rollout of government networks as described above and integration into the future NBN.

Investment by government in network services is motivated by the administrative efficiencies and enhanced service delivery that can be achieved when government facilities

are connected via broadband. As a result of government serving as an anchor tenant on the networks that will make up the government network, South Africa's broadband infrastructure will be expanded based on actual needs. It is worthwhile to consider that school density and location is entirely correlated with population density and therefore represents a major opportunity to support broadband rollout, in accordance with population density.

Critical success factors for the Digital development strategy are:

- coordination of planning and implementation across all relevant role players thereby avoiding duplication and leveraging synergies and resources optimally;
- smart buying of network components according to the policy principles and with the goals of this strategy in mind. This includes buying high capacity networks that meet future needs, investing in network assets that lower on-going operational cost and giving preference to offers that meet and support the broader goals of extending network infrastructure reach and access, through measures such as open access; and
- implementation of measures that will enable uptake and usage. Examples include the availability of electronic educational content, the use of tablets and mobile devices in schools, implementation of transactional e-government services and government cloud solutions to consolidate investments in government IT systems;

Table 2 - Digital development Policy Decisions

Requirement	Action
<p><b>Network planning and coordination</b> Coordination amongst all relevant role players to ensure optimal implementation and leverage of resources</p>	<ul style="list-style-type: none"> <li>SIP 15 will coordinate implementation of the digital development projects to address broadband needs and to ensure sustainable rollout.</li> </ul>
<p><b>Corporate government network</b> Enabling infrastructure for e-government and government administration.</p>	<ul style="list-style-type: none"> <li>Requirements analysis, planning, design and implementation of a national schools network by an appointed agency coordinated;</li> </ul>
<p><b>Schools network</b> Urgently enable teaching and learning as well as school administration through broadband.</p>	<ul style="list-style-type: none"> <li>Requirements analysis, planning, design and implementation of a national schools network by an appointed agency;</li> <li>Establish institutional capacity in the Department of Basic Education or a relevant agency to enable uptake and use of broadband in the basic education environment</li> </ul>
<p><b>Health Network</b> Enable eHealth and National Health Insurance (NHI) for improved health outcomes</p>	<ul style="list-style-type: none"> <li>Requirements analysis, planning, design and implementation of a national health network by an appointed agency;</li> <li>Establish institutional capacity in the Department of Health or a relevant agency to enable uptake and use of broadband in the health environment</li> </ul>
<p><b>Community networks</b> Rural and poor populations and underserved areas in general not well served by network infrastructure and services</p>	<ul style="list-style-type: none"> <li>Collaborative initiative involving DoC, DRDLR, COGTA and provinces to identify areas that require community network interventions and conceptualising and implementing such networks.</li> </ul>

#### 14. Building the digital future - roadmap for public and private investment in the next generation broadband network

The above two strategies, *Ensuring Digital Readiness* and *Digital Development*, coupled with the fourth strategy to enable uptake and use and stimulate demand, *Realising Digital Opportunity*, will go a long way towards improving broadband access and quality in South Africa. However, for South Africa to create a broadband infrastructure that will make it competitive in the long term, additional investment is required in a high capacity national broadband network. Such a network should build on and extend existing infrastructure and, in order to optimise limited financial resources, should coordinate investments in new infrastructure (green field) and upgrades to existing infrastructure (brown field).

Internationally, countries are following different strategies to build their national broadband networks. Based on analysis of global practice and taking account of the local context as described above, South Africa's National Broadband Network will be built as a long term collaborative initiative – one that establishes a high capacity, open access wholesale network that builds on existing infrastructure and involves both public and private sector players.

The building of South Africa's national broadband network will be pursued as a national project that will galvanise the capability, resources and energy of public and private actors towards realising a bold vision of a connected society in the spirit in which South Africa delivered on the 2010 FIFA World Cup. Whilst the benefits of such a world-class infrastructure are beyond challenge, implementing such a complicated and costly project will require a common roadmap that guides the actions of public and private sector players over a period of 10 to 20 years.

The huge cost of building a national broadband network underlines the requirement to enable both public and private investment in the network<sup>7</sup>.

In alignment with the policy principles as set-out, design criteria for the National Broadband Network include:

- Open access at the lowest possible level;
- Pooling and sharing of existing network assets by as many existing players as possible;
- Future network build outs based on a consortium model;
- Complementary roles for government, state owned enterprises and the private sector
- Spectrum sharing or pooling through the creation of a national open access wireless network, which would also address the regulatory requirement to encourage new entrants.

As indicated in the gap analysis, 86% of the population reside within 10 km of a fibre access node. The initial and immediate challenge is therefore to close this gap in the access

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<sup>7</sup> National Broadband network costs are significant. For example, the cost for Australia's Open Access Wholesale NBN aimed at provide FTTP to 93% of premises is estimated at A\$44 billion (R414,39 billion). Germany is planning to invest €20,243 billion (R274,06 billion) to connect 50% of households with VDSL and 25% with FTTH and France has announced a €22 billion (R 297,84 billion) investment in Broadband infrastructure.

network on a cost effective basis in conjunction with ensuring open access on a wholesale basis to the fibre backbone network.

The ultimate goals of this policy will only be realised through the deployment of fibre rich access networks building on a national fibre backbone. However, the high cost and time required to build fibre access networks demands that wireless access solutions need to be implemented in parallel with the planning and implementation of fibre access networks.

The speed of deployment of a wireless network is a fundamental consideration to meet the immediate challenge of meeting the targets of this policy. In line with the principle of open access for the NBN, the wireless component will be provide on a wholesale open access basis.

The futures of fibre-based access networks and the wireless access network both require access at affordable and non-discriminatory rates to fixed fibre backbone facilities in order to be able to offer attractive end-to-end wholesale services to retail services providers the quality of which it can manage and control.

**Open access wireless network** - The open access wireless broadband network will:

- Maximize the efficiency with which spectrum is used and minimize the costs of deployment of wireless broadband capacity with national coverage; and
- Provide a neutral, non-discriminatory platform on which effective competition can take place between multiple services providers at the retail level.
- Pool and share existing network assets by as many existing players as possible;
- Be based on a consortium model;

At this time the wholesale open access wireless network would currently utilise existing wireless 4G spectrum. Enabling conditions for a national wireless network in the 4G bands are:

- access to a portfolio of spectrum that includes substantial capacity in both sub 1 GHz and supra 1 GHz frequencies to be able to provide both capacity and coverage efficiently and economically from dense urban to rural areas; in South Africa this criterion would best be met by assigning the 800 MHz band (total of 2 x 30 MHz

available) and substantial amounts of the 2600 MHz band (total of 2 x 70 MHz FDD available + 50 MHz TDD available) to this network;

- use of existing facilities wherever possible (e.g. base station locations, fibre links for backhaul and long distance connectivity) to minimize its costs through infrastructure sharing;
- cost based, non-discriminatory access regime for service providers allowing them to compete fairly in the market and recoup their investments; and
- spectrum allocation will be apportioned to ensure the viability of the OA wireless Network in a fair competitive environment.

Key success factors:

- Attracting enough investment to deploy the network and use or sharing of existing facilities to minimize the deployment costs and the costs of interconnection, in an environment in which the level of the Government's direct financial contribution is constrained;
- Realistic coverage targets so the costs do not balloon out of control relative to any conceivable revenue stream;
- Attracting operators to use the wholesale services of the OA LTE network on a large scale;
- Support from the highest levels of Government;
- Long term financial horizon for return on investment; and
- Assignment of adequate spectrum to ensure the viability of the network.

### **Fibre rich backbone and access network NBN**

The envisaged model for the NBN is a joint venture between networks operators and investors (in a framework similar to those used in submarine cable consortia) to which operators' fibre assets would be transferred. This joint venture should be free to contract the supply and installation of additional fibre optic links and capacity to third parties through competitive bidding. This wholesale-only joint venture would offer services to all operators and service providers within an open access, cost-based and non-discriminatory framework regulated by ICASA.

The architecture, business model, investment plan and detail design will be refined through a collaborative road mapping process. The development of the roadmap will be guided by the Broadband Council and overseen by the Department of Communication, in collaboration with relevant agencies and experts. The roadmap development will involve extensive consultation with all relevant role players.

A first version of the roadmap to Broadband will be completed by April 2015. Elements of the broadband and building blocks include planning inputs, activities, outcomes, some of these are in progress through studies commissioned by National Treasury, Department of Communications and SIP15 (See Addendum 2 for outline of the roadmap).

*Table 3 Building the Digital Future Policy Decisions*

Requirement	Action
<p><b>Open Access Wireless Network</b> Creation of an open access wireless network</p>	<ul style="list-style-type: none"> <li>• Create or identify vehicle or entity to operate open access wireless network</li> <li>• ICASA to assign spectrum for open access wireless network</li> </ul>
<p><b>Open Access National Broadband Network</b> Models, design and roadmap towards a fibre rich Open Access National Broadband Network (NBN).</p>	<ul style="list-style-type: none"> <li>• Appointment of National Broadband Council;</li> <li>• Appointment of agency to assist the Department of Communication in the facilitation of the process to conceptualise and develop the open access NBN</li> </ul>

## 15. Realising Digital Opportunity

**National capability:** There is now considerable evidence to demonstrate the inequality of access and use of ICTs and the ability to deploy them to their full potential lies in the unequal capabilities of individuals and groups such as those living in rural areas, women, the elderly and persons with disabilities.

As ICTs becomes more complex, the ability to optimise their use correlates strongly with education and income. Those marginalised from education and therefore employment and income are most likely to be marginalised from the type of communications services required to participate meaningfully in a modern economy and society.

The National Development Plan draws attention to the fact that broadband vision for the country cannot be achieved without rectifying the human capital deficits in the country. "The human development on which all this is premised will have created an e-literate (online) public able to take advantage of these technological advances and drive demand for services. ICT will continue to reduce spatial exclusion, enabling seamless participation by the majority in the global information system, not simply as users but as content developers and application innovators." (NDP 2012)

Therefore strategies for inclusion in the information society and knowledge economy need to be central to national human development strategies. This needs to be made a national priority and a key element of the national project of digital inclusion.

- Supply side skills: Address high level skills shortage in sector (public and private) to meet the specialised needs of knowledge production necessary for innovation through the co-ordination department of DHET/DST/DOC.:
  - engineering and technical skills to design build and operate networks, services and content;
  - software developers, designers, writers, programmers and editors to produce and supply digital content
  - Dedicated sectoral training for job creation – call centre operations & management (youth development programme).
- Demand side skills: enable ubiquitous access and use of ICT though:
  - Instil digital skills through school curriculum programme – co-ordination DOE/DOC
  - national digital literacy project aimed at those marginalised from services. This will be addressed through national youth employment programme and programme such as each-one-teach-one.

Institutional capability: specialised policy and regulatory training and skills upgrade for staff in sector institutions. This is a particular challenge for individuals in institutions in this sector due to dynamic nature and requirement for high levels of technical expertise.

**R&D and innovation and entrepreneurship:** The socio-economic benefits of Broadband are, to a significant extent, reliant on national R&D capability and on a healthy innovation and entrepreneurship ecosystem. R&D not only creates the basis for technological innovation and entrepreneurship but enhances a country's ability to effectively absorb new technology, known as a country's "absorptive capacity". The National Development Plan proposes to invigorate and expand the economic opportunity through investment in infrastructure, more innovation, private investment and entrepreneurialism.

The Plan also recognises the role that R&D has played in helping middle income countries advance to higher income status. This is reinforced in South Africa's Information and Communication Technology R&D and Innovation Roadmap (ICT RDI Roadmap) which represents a plan for coordination and investment in ICT R&D, innovation activities and advanced skills. Broadband is one of the six clusters of market opportunities of the ICT RDI Roadmap and the other five rely on or build on Broadband. The ICT RDI Roadmap will be adopted as the guiding document for investment in ICT RDI and the Department of Communications will work closely with the Department of Science and Technology and other role players in implementation of this plan.

The Departments of Science and Technology and Trade and Industry have established a number of initiatives to support innovation and entrepreneurship. These initiatives will be harnessed to support innovation and entrepreneurship in Broadband.

**Content and Applications:** Given the potential impact of broadband on the South African economy, digital content – and the applications that allow that content to be accessed – increasingly becomes an important part of the broadband value chain and thus the broadband policy framework.

Digital inclusion extends beyond the rollout of networks, and is in many ways dependant on the availability of relevant content for local users. The content carried across broadband networks is the crux of the knowledge economy and the information society - without relevant content related strategies in e-health, e-government and e-education, amongst others, we are unlikely to succeed. In addition, targets in related to economic growth and employment will not be reached.

Recognising the need to promote local content, plurality and diversity in the digital content space Government will support the development of digital content and applications as a key part of the broadband policy.

Given that the Internet has fewer access barriers than traditional broadcasting channels (i.e. television and radio) and in light of the fact that consumers have access to various content in a multi-platform and multi-channel environment, traditional support measures for local and locally relevant content and diversity will be reassessed and the regulatory environment in that regard reviewed.

This policy seeks to encourage content development across the digital content value chain and by content producers including:

- Traditional content/entertainment industries whose primary activity is the production and sale of content,;
- Industries that are not content industries per se, but which in light of convergence and the prevalence of new media, increasingly produce digital content
- Government activities in areas such as research, education, health and culture
- User generated content, such as that created on social media networks, information/news feeds (such as Twitter), and platforms such as You Tube.

This policy encourages the development or generation of content through:

- encouraging the production, supply and use of public sector information and content; this includes promoting the digitisation and distribution of public sector information and improving access to public sector content (archives, museums);
- promoting demand for local digital content through increasing public sector efficiency and facilitating public demand aggregation, particularly in rural and remote areas, for example through the development of e-health and online education content and applications;
- Enhancing access to local content, diversity of content supply and use;
- Encouraging the development of e-skills in primary, secondary and tertiary education; and
- Promoting R & D in ICT applications, content and services locally;

The mechanisms to achieve and fund these outcomes will form part of the wider national creative industries strategy to be developed by DTI and DOC.

Table 4 Digital Opportunity Policy Decisions

Requirement	Action
<p><b>National capability</b> Requisite e-literacy and skills to use broadband</p>	<p>The Department of Communication will engage with</p> <ul style="list-style-type: none"> <li>• Department of Basic Education on school curriculum development</li> <li>• Department of Labour and SETAs adult e-literacy, youth development and sectoral programmes.</li> </ul>
<p><b>R&amp;D and innovation and entrepreneurship</b> Development of high level skills and critical mass R&amp;D capability to drive innovation</p>	<ul style="list-style-type: none"> <li>• Enable public and private investment in ICT R&amp;D through implementation of the ICT RDI Roadmap</li> <li>• Development of professional development and postgraduate in multi-disciplinary programmes to meet the diverse skills requirements within the strengthen the ICT ecosystem</li> <li>• Support entrepreneurship and innovation through a coordinated incubator and mobile applications laboratory programme</li> </ul>
<p><b>Content and Applications</b> Absence of local content, local production and innovation in content and applications.</p>	<ul style="list-style-type: none"> <li>• Establish a local content/public service content and apps production and innovation fund to incentive public and private content development that is relevant, in local languages</li> </ul>

## 16. Funding

The scale and scope of the interventions to be undertaken for South Africa to meet its broadband targets requires investment by both the public and private sector. An environment conducive to private sector investment will be created through enabling policy and regulation and through the certainty and clarity this policy provides.

More specifically, the strategies in this policy will be funded as follows:

- *Digital readiness* and *Digital Opportunity* will be funded through reprioritisation and rationalisation of existing allocations to ensure alignment value for funds appropriated from parliament
- *Digital development* will be funded through:

- existing provincial baselines and appropriations by parliament with contracts providing for a phased approach which maximises equitable access;
- parliamentary appropriation will happen through provincial conditional grants with conditions on treatment of cross boundary contracts to provide for single contract with a single project manager;
- in addition, a national satellite programme for areas where terrestrial networks are not suitable will be funded through parliamentary appropriations and managed nationally;
- *Digital future* will be funded through public and private funding sources.

In addition, the Department of Communications will engage with other government departments to explore funding of aspects of the policy including:

- through synergies with budgets for construction works such as public works and the neighbourhood development partnership grant as well as investment by the Department of Rural Development and Land Reform; and
- coordination with sector specific agencies and funds such as the Media Development and Diversity Agency (MDDA), relevant Sector Education and Training Authorities (SETAs), the Universal Service and Access Fund (USAF), the Skills Development Fund.

Realising South Africa's broadband vision will however require new significant funding from National Treasury. Government spending in this area will be leveraged through public private collaboration.

Furthermore, the development finance institutions such as the Development Bank of Southern Africa (DBSA) and Industrial Development Corporation (IDC) will be utilised to finance broadband deployment prioritizing rural and underserved areas.

## APPENDIX: National Broadband Implementation Plan

### *Digital Readiness - Policy decisions*

Issue	Action
<p><b>Market Structure</b> Vertically integrated incumbents hindering fair competition</p>	<ul style="list-style-type: none"> <li>Initiate process to establish open access national fibre and wireless broadband network consortium.</li> </ul>
<p><b>Institutional arrangements</b> Appointment process, funding arrangements, institutional design, capabilities and competencies produced negative outcomes</p>	<ul style="list-style-type: none"> <li>Review of the regulator and universal service agency governance structure, leadership appointment process and funding arrangement will be fast-tracked by the ICT Review Panel to ensure requisite capability to remove regulatory bottlenecks relating to:               <ul style="list-style-type: none"> <li>open access</li> <li>spectrum</li> <li>competition</li> </ul> </li> </ul>
<p><b>Enabling infrastructure build</b> Hurdles and bottlenecks hampering broadband rollout</p>	<ul style="list-style-type: none"> <li>Authority for enforcement of Rapid Deployment Guidelines to be included in Infrastructure Development Bill</li> <li>DoC to engage with DEA on the development of a Strategic Environmental Impact Assessment for broadband infrastructure</li> </ul>
<p><b>Spectrum</b> Failure to allocate high demand spectrum</p>	<ul style="list-style-type: none"> <li>Ministry issues policy directive within month of this notice and ICASA issues regulations by end of 2013 and assigns spectrum by first quarter 2014</li> </ul>
<p><b>Legal and regulatory framework</b> Aligning legislation in support of Broadband diffusion</p>	<ul style="list-style-type: none"> <li>The Department will undertake a review of all relevant legislation and regulation required to enable implementation of this policy</li> </ul>
<p><b>Analysis, Information and indicators</b>  Absence of indicators to inform national decision making and inadequate reporting to UN and other multilateral agencies</p>	<ul style="list-style-type: none"> <li>ICASA to prepare information reporting regulations to ensure collection of ITU universal indicators;</li> <li>DoC to work with Stats SA on regular production of ICT satellite account from the national accounts to assess contribution of sector to national economy; and</li> <li>DOC to budget for and manage demand survey to comply with UN commitments to Measuring the Information Society.</li> </ul>

### *Digital development Policy Decisions*

Requirement	Action
<p><b>Network planning and coordination</b> Coordination amongst all relevant role players to ensure optimal implementation and leverage of resources</p>	<ul style="list-style-type: none"> <li>SIP 15 will coordinate implementation of the digital development projects to address broadband needs and to ensure sustainable rollout.</li> </ul>

**Corporate government network**  
Enabling infrastructure for e-government and government administration.

- Requirements analysis, planning, design and implementation of a national schools network by an appointed agency;

**Schools network**  
Urgently enable teaching and learning as well as school administration through broadband.

- Requirements analysis, planning, design and implementation of a national schools network by an appointed agency;
- Establish institutional capacity in the Department of Basic Education or a relevant agency to enable uptake and use of broadband in the basic education environment

**Health Network**  
Enable eHealth and National Health Insurance (NHI) for improved health outcomes

- Requirements analysis, planning, design and implementation of a national health network by an appointed agency;
- Establish institutional capacity in the Department of Health or a relevant agency to enable uptake and use of broadband in the health environment

**Community networks**  
Rural and poor populations and underserved areas in general not well served by network infrastructure and services

- Collaborative initiative involving DoC, DRDLR, COGTA and provinces to identify areas that require community network interventions and conceptualising and implementing such networks.

### *Building the Digital Future Policy Decisions*

Requirement	Action
<p><b>Open Access Wireless Network</b> Creation of an open access wireless network</p>	<ul style="list-style-type: none"> <li>• Create or identify vehicle or entity to operate open access wireless network</li> <li>• ICASA to assign spectrum for open access wireless network</li> <li>• Appointment of National Broadband Council;</li> <li>• Appointment of agency to assist the Department of Communication in the facilitation of the process to conceptualise and develop the open access NBN</li> </ul>
<p><b>Open Access National Broadband Network</b> Models, design and roadmap towards a fibre rich Open Access National Broadband Network (NBN).</p>	

### **National Broadband Network Roadmap**

Planning of the NBN will be based on a logical planning from work as outlined below:

- Planning inputs

- Study of global best practise and trends
- Broadband demand model
- Mapping current and planned network infrastructure
- Network build models
- Economic models
- Planning activities
  - Desktop and other studies
  - Workshops
  - Modelling demand and supply options
  - Economic modelling
- Outputs
  - Shared common vision
  - Future network architecture
  - Timeline
  - Monitoring and evaluation framework
- Outcomes
  - Consensus amongst all key stakeholder in the public and private sector around a vision
  - Roadmap to achieve the vision, facilitating investment by the public and private sector
  - A vibrant ICT ecosystem with an
  - Open competitive market, with better co-ordination by state of national resurfaces, collaboration with private sector for delivery...
  - Leverage of public and private resources, energy and capability towards South Africa's Broadband vision
  - Optimising spectrum use through open access

## Digital Opportunity Policy Decisions

Requirement	Action
<p><b>National capability</b> Requisite e-literacy and skills to use broadband</p>	<p>The Department of Communication will engage with</p> <ul style="list-style-type: none"> <li>• Department of Basic Education on school curriculum development</li> <li>• Department of Labour and SETAs adult e-literacy, youth development and sectoral programmes.</li> </ul>
<p><b>R&amp;D and innovation and entrepreneurship</b> Development of high level skills and critical mass R&amp;D capability to drive innovation</p>	<ul style="list-style-type: none"> <li>• Enable public and private investment in ICT R&amp;D through implementation of the ICT RDI Roadmap</li> <li>• Development of professional development and postgraduate in multi-disciplinary programmes to meet the diverse skills requirements within the strengthen the ICT ecosystem</li> <li>• Support entrepreneurship and innovation through a coordinated incubator and mobile applications laboratory programme</li> </ul>
<p><b>Content and Applications</b> Absence of local content, local production and innovation in content and applications.</p>	<ul style="list-style-type: none"> <li>• Establish a local content/public service content and apps production and innovation fund to incentive public and private content development that is relevant, in local languages</li> </ul>