**CITY OF JOHANNESBURG**
**DEPARTMENT OF ECONOMIC DEVELOMENT**


**CITY OF JOHANNESBURG BROADBAND POLICY FRAMEWORK**

**MAY 2009**



**Joburg**

a world class African city

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**LIST OF ACRONYMS**

| | |
|---|---|
| **BBBEE** | Broad-based black economic empowerment |
| **BPO** | Business Process Outsourcing |
| **BMI-T** | BMI-TechKnowledge |
| **BRT** | Bus Rapid Transport system |
| **CID** | City Improvement District |
| **CoJ** | City of Johannesburg |
| **ECNS** | Electronic Communications Network Service |
| **EIA** | Environmental Impact Assessment and Approval Process |
| **EMM** | Ekurhuleni Metropolitan Municipality |
| **FET** | Further Education and Training |
| **FIFA** | Federation of International Football Associations |
| **FTTx** | Fibre to the x, where x can be home, curb, desk, etc. |
| **GDS** | Growth and Development Strategy |
| **GIS** | Geographic Information System |
| **G-Link** | Gauteng broadband link |
| **GPG** | Gauteng Provincial Government |
| **HDTV** | High Definition Television |
| **ICASA** | Independent Communications Authority of South Africa |
| **ICT** | Information and Communications Technologies |
| *info***Dev** | Information for Development, The World Bank |
| **IPTV** | Internet Protocol Television |
| **ITU** | International Telecommunication Union |
| **JBF** | Johannesburg Broadband Forum |
| **JDA** | Johannesburg Development Agency |
| **Kbps** | kilobits per second |
| **LED** | Local Economic Development |
| **Mbps** | Megabits per second |
| **NGN** | Next Generation Networks |
| **PSTN** | Public Switched Telecommunications Networks |
| **QoS** | Quality of Service |
| **SANReN** | South African National Research Network |
| **SAPS** | South African Police Service |
| **SME** | Small and medium enterprises |
| **UDZ** | Urban Development Zone |

## DEFINITIONS

'The term "**broadband**" is typically used to denote an Internet connection with download speeds faster than traditional dial-up connections (at 64kbps)…minimum threshold for bitrates at 256 kbps'.
[From: OECD (2008). Broadband and the Economy, Ministerial Background Report, OECD Ministerial Meeting on the Future of the Internet Economy, Seoul: Korea, 17 – 18 June 2008, p7]

**Broadband refers to '**an array of digital, packet-switched network technologies that allow the transport of digital bits at high speed … Generally, networks with bandwidth capacities of 256 kbps can be termed broadband'.  It should be noted that broadband speeds are subject to rapid change as regards their definition, as demand for bandwidth increases and new content offerings require ever greater bandwidth.
[From: International Telecommunication Union (2006). Trends in Telecommunication Reform 2006: Regulating in the Broadband World, Summary, pp 5 – 6]

**Broadband access technologies** include a wide range of technologies such as various types of digital subscriber line (xDSL), power line cable (PLC), optical fibre lines to a particular end-point (FTTx e.g. to the curb, home, desk), broadband wireless (Wi-Fi, WiMAX), digital broadcast infrastructure (including satellite, cable and terrestrial technologies) and mobile (2.5G, 3G and 4G).
[From: *info*Dev and ITU (2007). ICT Regulation Toolkit Module 7: New Technologies and their Impacts on Regulation, Executive Summary, Technical University of Denmark, March 2007, pp 17 & 20 - 23]

**Broadband IP infrastructure refers to broadband core networks** that utilize IP (Internet Protocol) platforms, including next-generation technologies such as IPv6, and which effectively replace the distinct PSTN (public switched telecommunications network), ATM (asynchronous transfer mode), IP-based telecommunications and analogue broadcast networks.  This core network enables aggregation of a wide range of broadband access technologies on a single converged network.
[From: *info*Dev and ITU (2007). ICT Regulation Toolkit Module 7: New Technologies and their Impacts on Regulation, Executive Summary, Technical University of Denmark, March 2007, pp 12, 14, 18 – 19]

**Broadband networks** are regarded as those high bandwidth networks which enable 'triple play' or the utilization of three services, namely VoIP (Voice over Internet

Protocol), Internet and IPTV (Internet Protocol television), or what is more often referred to as voice, data and video.  Broadband networks also offer multiple play or additional services to these three.  This can enable a user experience, both as recipient and as content creator, where we 'combine images and information in ways that can actually augment the user's experience into something more enriched than actually being there'.   However, this enhanced experience will typically require higher bandwidth than 256kbps.

[From: *info*Dev and ITU (2007). ICT Regulation Toolkit Module 7: New Technologies and their Impacts on Regulation, Executive Summary, Technical University of Denmark, March 2007, p 20; ITU (2006). Trends in Telecommunication Reform 2006: Regulating in the Broadband World, Summary, pp 5 – 6; and interviews with South African network operators and service providers]

For the purposes of this policy framework, **broadband network** refers to high-bandwidth networks which may be based on a variety of technologies.  **Broadband** is associated here with the concept of multiple-play services, where a number of services that require high bandwidth can be transmitted over the same core network, for example voice, data and video.

## EXECUTIVE SUMMARY

The City of Johannesburg has adopted a Broadband Policy as a means to clarifying its views on the extension of broadband networks to all parts of the city. It regards network extension as a fundamental infrastructure for communicating and doing business, and affordability of access as a key driver for growth and development. It acknowledges that we live in an era of rapid technological advances in electronic media, and that the city government is required to be agile and adept with respect to stimulating broadband network extension, to meet the needs of the more than 3.6 million people and the thousands of small and large businesses that populate Johannesburg. It invites all stakeholders to participate in achieving the broad purpose of this policy framework.

The intention of this policy is to facilitate greater levels of ICT and broadband usage as enablers of business and consumer services, education and research, life and leisure; to develop Johannesburg's information and communications infrastructure and capacities as a globally significant city, with affordable high-speed broadband as a key network infrastructure for living and doing business; and to create an environment for Next-Generation-Networks (NGN) to flourish in order to ensure that advances in information and communications technologies are introduced and made accessible to Johannesburg's people and businesses, in response to local demand.

The Broadband Policy Framework 2009 sets out 14 policy actions, including general and strategic actions, as well as facilitating structures; and 5 policy recommendations, designed to achieve this stated purpose.

The document is composed of two parts, namely the Policy Framework itself (Part 1) and the Discussion of the Policy Context (Part 2).

## Policy Vision

*'A digital city with network infrastructures that support economic and social development, with particular attention to the strategic and priority economic sectors which define Johannesburg's economy, to marginal consumers and to good governance.'*

# PART 1     CITY OF JOHANNESBURG BROADBAND POLICY FRAMEWORK 2009

## 1.1     Preamble

The City of Johannesburg Broadband Policy , sets the basis for broadband development in the City. Based on the understanding that network infrastructure and its correlation with economic and social development is a complex and rapidly evolving aspect of economies, and that the shift to next generation networks is a global phenomenon, policy frameworks will be issued from time to time as the changing context requires.

Noting the emergence of broadband as a powerful resource in economies across the globe, and the increasing demand for affordable high-speed connectivity amongst South African consumers, the City of Johannesburg has focused its attention on the potential value of broadband networks to local economic development since 2003, adopted a broadband strategy roadmap in 2005 and developed a broadband network investment model from 2007.  It now seeks to clarify its policy view on broadband network infrastructure and to make this view known.

As a broad policy frame, this framework seeks to establish the vision, rationale, purpose, objectives and actions for the City of Johannesburg.  The particular detailed strategy(ies) and business models required to achieve the policy purpose and objectives will be addressed separately.

## 1.2     Background

This policy  is based on the following historical data for the city:

Johannesburg is the seat of the provincial government of Gauteng and the financial centre of South Africa.  It generates over 16% of the country's wealth and hosts the headquarters of more than 70% of South African companies. The Johannesburg metropolitan area covers 1 644km².  The city has a population of more than 3.6 million people living in more than 1 million households, of which 1.5 million people are economically active.   Nearly 50% of the population is under the age of 34. Johannesburg will continue to witness in-migration from South Africa and the continent, with increasing demand for economic and social infrastructure.  If the city offers the requisite financial, municipal, roads and telecommunications infrastructure, it

can enable an income-generating environment for the local population and continue to operate at the level of leading world cities. The city administration seeks to make Johannesburg an attractive environment for economic activity, in order to sustain the levels of growth necessary to support its population.

As regards large businesses, next generation broadband can bring convergence in services with access via a multiplicity of terminal devices, quality of service, integration of legacy and new network technologies, high speeds for data transfer, increased network security and generalized mobility.

As regards small enterprises, the city administration and institutions such as the University of Johannesburg's Centre for Small and Medium Enterprise Development in Soweto can facilitate actions to bring computing power and network access to developing economic zones within a reasonably short timeframe.

As regards households, community and NGO access, facilitation of investments in broadband can promote access to information, to the Internet and to the electronic facilitation of services to households.

As regards the city government itself, affordable access to broadband infrastructure can support greater efficiency in information management, a major area of activity; and in particular can promote e-government, including providing the cost effective network access required for emergency medical services and disaster management.

## 1.3    Policy rationale, purpose and objectives

The overarching goals of the City of Johannesburg Broadband Policy Framework 2009 are to contribute to the process of building an 'information society', to reduce the digital divide and to enhance the city's brand as a global digital hub.

### 1.3.1    Policy Rationale

In the period 2009 to 2030, Johannesburg is building its positioning and branding as a global city, through working to promote social inclusion and local economic development beneficial to the more than 3.6 million residents of the city. It therefore intends to facilitate access to network infrastructures that will enable high-

speed connectivity, generalized mobility and quality of service for ease of communications and business, for the use of residents, business, governmental and non-governmental institutions, and international visitors. This network access will support the drive for sustained economic development over the medium to long term.

### 1.3.2    Policy Purpose

The intention of this policy is to facilitate greater levels of ICT and broadband usage as enablers of business and consumer services, education and research, life and leisure; to develop Johannesburg's information and communications infrastructure and capacities as a globally significant city, with affordable high-speed broadband as a key network infrastructure for living and doing business; and to create an environment for Next-Generation-Networks (NGN) to flourish in order to ensure that advances in information and communications technologies are introduced and made accessible to Johannesburg's people and businesses, in response to local demand.

### 1.3.3    Policy Objectives

The following ten (10) policy objectives guide the City of Johannesburg in harnessing the value of its existing telecommunications assets and any future assets, for social and economic advancement, as an important component of its 'digital city' initiative:

As regards the information superstructure:
   (a) High-speed Internet access, generalized mobility and quality of service for everyone living in, working in or passing through the city of Johannesburg
   (b) Broadband connectivity and affordable usage for large businesses and SMEs; for public sector organizations and municipal government; for large non-governmental organizations, in particular universities and research entities; for community-based and not-for-profit organizations; and for households with particular emphasis on low-income or digitally-excluded households
   (c) Digital communications in all key areas of the economy and society including finance and banking, mining and manufacturing, travel and tourism, media and culture, health and education, emergency services and disaster management, government services

As regards social inclusion and local economic development:

(d) Economic participation of SME and BBBEE companies in telecommunications provisioning

(e) Participation of SME and BBBEE companies in providing 'last mile' communications access and growing the productive SME sector

(f) Encouraging the utilization of information and communications networks as a contributing resource to local economic development

As regards the infrastructure:

(g) Clear direction on usage of rights-of-way

(h) Encouraging wholesale pricing that is competitive

(i) Low-cost interconnection with the City of Johannesburg's network infrastructure by telecoms operators and service providers in order to promote a competitive telecoms and broadband environment

(j) Continuous migration to next-generation-networks, bringing technological advances to the city

## 1.4     Scenario Based Policy Ambition for Johannesburg Broadband

**T**he policy scenario presented below relates to the information and communications side of the life of South African society.  It is designed in terms of the ambitious long-term vision for the city's development to 2030 and beyond, as presented in the many social and economic policies for the city's future.  The scenario sketches a level of idealism, while at the same time presenting a future perspective different from the reality of today, against which to peg a broadband policy framework.

### 1.4.1    Scenario: Johannesburg Digital City

This is a high-impact scenario assuming radical change and a metro-scale economic focus, in which the actions to build a metropolitan area broadband network become the focus of all stakeholders, with high visibility for all firms across the revenue spectrum, for all households across the income spectrum, and for government, public institutions and the not-for-profit development sector.  Broadband is viewed as a network infrastructure that radically changes the working environment and the lifestyles of the overwhelming majority of the City of Johannesburg's population.  Seen simply as a form of communications infrastructure that allows multiple-play, with the current generation of broadband being largely triple play of voice, data and video,

together with the many other network infrastructures including the electricity, the road and rail network and the bus rapid transport infrastructure, broadband networks enable Johannesburg to become a 21st century city.

Here, the financial services sector concentrated in Sandton; the widespread retail sector; the conferencing, hospitality and tourism sector; the many sports facilities and venues; schools and universities; clinics, hospitals, emergency medical services and disaster management response teams; the SAPS and metro policing operations in Gauteng; large commercial business and small and medium enterprises; all will have access to broadband infrastructure to facilitate communication and transactions from email to e-ticketing and e-learning. The evolution of broadband networks in the city fosters the development of new small businesses such as Internet café's and other public Internet access sites for ease of access to information and services.

The continuous upgrading of the city's public, commercial and residential infrastructure is paralleled by the continuous upgrading of broadband networks, in the same way that the continuous upgrading of previous decades was accompanied, first by extension of the narrowband fixed telecommunications network and then by the extension of the mobile network to cover all parts of the metropolitan municipality's geographic area. Asymmetrical broadband evolves to symmetrical broadband as telecommunications users change their behaviour from just accessing information and services to also offering information and services.

For the population of Johannesburg, constantly on the move from home to work to play, instantaneous access to information at any place at any time is facilitated by the availability of both fixed and wireless broadband connectivity. Plans for new residential areas, new buildings, new schools and other community facilities incorporate plans for broadband access as an important network infrastructure to support administration and social activity, and become an integral component of urban planning. The availability of broadband infrastructure is attractive to new businesses to locate themselves in the city, hence those businesses who consider Johannesburg as a possible location find the necessary broadband and other infrastructure required to do business. Similarly, families are attracted to live and work in the city due to, amongst other things, the high levels of broadband connectivity for work, school and play, and safe and secure communities.

Johannesburg is connected to its surrounding municipalities, the rest of South Africa and the continent in virtual space and time, enabling it to be a global African hub as envisaged in its strategic vision for 2030 and the future. Digital connectivity in the surrounding municipalities of the Gauteng province means that a visitor, business person, investor or student can be connected to the world, whether through a fixed or mobile Internet connection, from arrival at OR Tambo International airport to conducting business in Soweto or Sandton; while a student can access fixed or mobile Internet whether at school, visiting relatives or making entertainment choices. The city administration communicates with Johannesburg residents through a multiplicity of online technologies, such that broadband, as one of many infrastructures contributes to promoting good governance ie. transparent and responsive local government. Since network infrastructure is only a transport mechanism and requires applications, content, services and transactions to make it a productive asset, the city administration views its own business as one of many 'market makers', placing a wide range of local public services and interactions in the online environment, both in virtual space and in public walk-in centres. This includes access to all financial information for the city's residents and businesses including rates, taxes and services payments, learning from models such as mobile and Internet banking.

Effective utilization of public funds for infrastructure provision sees this scenario achieved through a combination of municipal facilitated networks and public-private partnerships. Since a relatively large proportion of Johannesburg's population become broadband users in the next five to ten years, the local telecoms market undergoes an expansion phase. However, the investment required to provide the envisaged levels of broadband connectivity requires multiple sources of investment, including public and private funding. Thus, as regards infrastructure development and financing; the complexities around the demand and supply factors; the appropriate mix of public and private ownership and funding; non-duplication of infrastructure; administrative efficiency to support private sector infrastructure roll-out; an enabling policy and regulatory environment with respect to the city's by-laws; affordability and access for public institutions and low-income communities; migration to future technologies and next generation networks; these matters require an ongoing conversation amongst the city's stakeholders, including the city administration, the provincial government, the fixed and mobile telecommunications operators, the

business user community, and community user groups, as no policy can address the full range of complexities.

Where gaps are identified in the broadband infrastructure map with respect to access for marginal consumers, the city administration finances the expansion and replacement of backhaul infrastructure (including ducts, dark fibre, high sites, etc), as well as parts of the broadband core network. It therefore owns those parts of the network and makes them available on an open access, carrier neutral model. It encourages infrastructure sharing and the evolution of ubiquitous networks for the city, while limiting its own financing role and taking on a market facilitation role. It further encourages increasing participation of black and small business in the telecommunications market.

The focus on social inclusion and increasing economic participation, to foster Digital Johannesburg city, draws the attention of the city administration to those parts of the local economy and geography that are likely to be excluded from participation in the information society or knowledge economy by virtue of low incomes, low levels of affordability or other forms of marginalisation. In this scenario, incremental change in community access to broadband is a restraint on development for the poorest sections of the population; and a constraint on growth in the SME and informal sectors. Since the city's policies for local economic development aim to foster growth across all 7 regions of the city and across all sectors of the local economy, broadband becomes a supporting infrastructure in the metro-wide endeavour for Johannesburg to offer its residents experiences that are 'world class' in terms of access to information, electronic services and the lifestyle of a 21st century information society. Hence, the City of Johannesburg becomes a leader in the 21st century, just as it was a forerunner in the 20th century South African and world economy.

The provision of broadband to those parts of the city which have historically been the last recipients of basic and advanced infrastructure, sees a shift from a paradigm in which the city works for those who can afford new infrastructure to a city that works for all private and corporate citizens, large and small, rich and poor. Promoting greater equality amongst citizens, with respect to infrastructure is a goal that sees a high level of commitment and therefore also public investment from the administration, on the understanding that greater equality in access to infrastructure

and services is a necessary foundation for future growth and prosperity. The city prioritises those geographic areas where it will invest in building or facilitate the building of broadband networks, and does not seek to build a ubiquitous network for the city.

While affirming the need for the development of future generations of young people to be fostered through the dedication of teachers and learners, the attention to making opportunities available for online access to educational resources, is based on the practicalities of conveying more complex ideas and images than can be conveyed through textbooks or traditional teaching methods. Web-searching, video-streaming, podcasting, student-generated content, etc become complementary forms to traditional methods, and are supported by available bandwidth, based on demand.

The work of provincial and municipal government within the city's municipal boundaries, including health services, emergency medical and fire services, websites for access to provincial and municipal information, and increased communication between the administration and the local population with respect to city development is made easier through broadband communications.

SMEs and community projects can tap into affordable access to broadband as a platform for creating greater economic participation and enhancing access to information. SMEs supplement their resources for doing business with electronic media of varying kinds. SMEs and community projects increase their levels of entrepreneurialism given the availability and affordability of the communications infrastructure for doing business. Broadband infrastructure becomes a resource alongside a range of other resources for fostering the growth of SMEs and the success of community projects.

Demand for bandwidth changes over time and differs with respect to the particular services and applications being used. Thus, the city administration takes a cautious approach to broadband deployment in terms of what it will finance and own. It conducts regular demand-side surveys to understand the changing pattern of needs and adjusts its planning and budgets accordingly. It collaborates closely with the Johannesburg Development Agency (JDA) which is responsible for the implementation of the city's infrastructure development plans. It collaborates with surrounding metro

and district municipalities, and with the Gauteng provincial government, in order to plan effectively for broadband deployment across the city in ways which minimize the cost to the city administration. It communicates with the private sector in order to inform its decision-making processes with respect to understanding where the city's investments and/or ownership will have the most beneficial impact, introducing incentives to stimulate broadband network extension such as 'smart subsidy' models, for example, least cost subsidy and encouraging SME development and BBBEE participation. It collaborates with the private sector in terms of operating those components of the network that it finances and owns.

## 1.5     Policy Actions for Johannesburg Broadband

With respect to the scenario for the *Johannesburg Digital City*, a set of policy actions is required to make this scenario possible. The following fourteen () policy actions will be promoted in order to stimulate broadband network extension and increase the numbers of users coming on to the network:

### 1.5.1     General Actions

1      The City of Johannesburg will play the role of facilitating the evolution of broadband communications and socially inclusive Internet access over the next 10 year period and beyond, in support of its goal to be a competitive 'world class' city in the year 2030 and in the future.

2      Annual reviews of progress with respect to this policy framework will be conducted, reported to the Mayoral Council and published.

### 1.5.2     Strategic Actions

3      The CoJ will establish a process for rethinking the telecoms landscape from a city perspective, including ubiquitous broadband; broadband corridors, wireless and wired spaces; Free Internet Zones; broadband partnerships; smart incentives; infrastructure sharing; and other measures towards lowering the cost of telecommunications within the city limits; – a Digital Futures Process.

4       The CoJ aspires to be a model broadband user, where approved public information would be made available for residents, businesses and visitors to the city via electronic media, as a means of leveraging the productive utilization of the emerging broadband network through content provision – Johannesburg's electronic services. This e-governance approach will include availability of broadband connectivity to all premises and buildings used by the city administration, including but not limited to public libraries and community centres. Measures to stimulate SME usage will seek to address the real needs of small business for high-speed communications. Broadband access will be used, inter alia, to facilitate greater mobility across the city, through promoting smart transportation solutions and route monitoring via the cities' extensive camera network, and improved safety through more effective precinct monitoring.

5       As regards the telecommunications assets of the City of Johannesburg, it will make these assets available to network operators, service providers and ECNS licensees at a cost deemed appropriate by the city's Broadband Assets Office on an open access basis, for the express purpose of extending the broadband network across the city in a period of 3 – 5 years, aiming for full broadband coverage of the city by 2014 and contributing to the foundations for upgrading to next generation networks.

6       The conditions for use of the CoJ's telecommunications assets and infrastructure by external operators, providers and licensees is that usage will be (a) on an open access, carrier neutral basis; (b) on an economical basis in terms of the costs to the city; (c) the environment must be reinstated (returned to its original or better condition) within a maximum period to be specified from time to time; and (d) explicit attention must be paid in the process of network extension to 'green ICT' planning for the preservation and enhancement of the environmental ecosystem.

7       Where the city administration identifies the need for financing and owning backhaul infrastructure (including dark fibre and high sites) and parts of the broadband core network, whether for its own or public use, when necessary, the city will support its planning and budgeting with demand-side studies to

ensure efficient and effective use of public resources. In such cases, the city will engage in commercial relations where necessary to build, maintain and operate the infrastructure and will encourage the participation of SME and BBBEE companies.

### 1.5.3   Facilitating Structures

8       The CoJ will establish a Forum at which broadband pervasive problems will be discussed. This forum will invite participation to a broader spectrum of the broadband players, to consult on matters addressed in this policy and on matters of general interest to user groups and communities over the medium to long term. Similarly, the CoJ will invite the range of broadband providers, including the established private commercial sector, the public non-commercial sector, and the newly licensed ECNS licensees, to either separately or collectively engage in consultations towards the pervasive deployment of broadband networks and with respect to other matters addressed in this policy framework.

9       The CoJ will collaborate with the provincial government and the five metro and district municipalities of Gauteng with respect to the common objectives of the G-Link programme of the provincial government and the city's broadband policy focus.

10      Over the medium to long term, the CoJ will build a GIS record of its telecommunications and ICT assets to inform decision-making on the deployment of telecommunications infrastructure by the public and private sectors.

### 1.6   Shaping Key Policy Initiatives

### 1.6.1   Digital Futures Process

The next phase of development of the City of Johannesburg towards becoming a 'digital city' is reliant, to a significant extent, on taking the appropriate policy, strategy and administrative actions, including introduction of any by-laws, that will enable the

evolution of network infrastructure including broadband and next generation networks (NGN), concomitant with demand, and at affordable prices.  At the same time, only the public and commercial usage of these networks, not their mere existence, will make Johannesburg a digital city. This phase involves a complex mix of issues and a complex set of players including the people of the city; economic role-players; national, provincial and local government, as well as the regulatory agency ICASA.  Within the CoJ itself, a number of departments have an interest in the future utilization of broadband and NGN networks.  Because the issues that will arise and their precise interaction are impossible to contemplate in advance, and since the city administration wishes to ensure well-informed decision-making on these matters, the Digital Futures Process will aim to promote the conversation amongst all players by holding a series of conversations including:

- One-on-one (or collective) conversations with telecommunications network operators and service providers
- Conversations with all the major government players, both internal and external to the city administration
- Conversations with the broad telecommunications user community

The objective of these conversations will be to deduce the most appropriate policy, strategy and administrative approaches to the evolution of a 'digital city'.

## 1.7     Relationship Management for Policy Effectiveness

### 1.7.1    Johannesburg Telecommunications Assets Office

The envisaged Telecommunications Assets Office will coordinate activities and provide managerial support to the formation of a forum or any other institution established under the broadband project.

## 1.8     Policy Recommendations for Realising the Value of Broadband

1.8.1    The CoJ will discuss with stakeholders and communities, the ICT-related development of selected areas of the city, as well as the future value to be leveraged from the International Broadcast Centre. This will include but not be limited to the Ellis Park area, NASREC and Soccer City area and surrounds, the

whole of Soweto, the Johannesburg city centre and the major cultural and entertainment areas in the city. This is based on the recognition that engaging the people of Johannesburg in content usage and production creates the legacy.

1.8.2    The CoJ will seek commercial and non-governmental partners in creating high-speed wireless access hubs for attracting businesses in selected areas, especially SMEs, to embed themselves in small (proto-) economic hubs as a means to enhancing economic activity in areas poorly served by infrastructure.

1.8.3    The CoJ will focus attention for long-term planning on those aspects of ICT infrastructure, services and content which could benefit City Improvement Districts. It will initiate an ICT-for-development scheme for Johannesburg's older townships including Alexandra, Orange Farm and other marginalised areas, in order to bring hi-speed access progressively to these parts of the City in the next 5 – 10 years.  It will consider incorporating ICT infrastructure into the UDZ incentive.

1.8.4    As key principles of ICT infrastructure design for the City of Johannesburg, encourage ICT networks for the City to (a) track property development both business and residential, because this ensures more efficient utilization of the infrastructure spend; (b) be integrated into special projects for the city such as the BRT, and others; and (c) make ICT for safety and security a priority, so that people can be out and about in the City, utilizing the wide range of infrastructure and services.

1.8.5    Utilising broadband and next generation networks as means to creating the 'digital city', the CoJ will facilitate, inter alia:
• Extension of ICT infrastructure, facilities, services and content to education and training institutions and to the greater Johannesburg workforce in order to promote '**knowledge work**' and effective participation in the emerging '**network knowledge economy**'.
• A structured **digital inclusion programme,** drawing in municipal government departments and entities, private-sector and non-governmental collaborations, through initiatives that foster citizen participation in **electronic governance** and content production; and promote ICT-enabled economic 'hubs' for SMEs and

the informal sector to link easily to the mainstream economy, using smart incentives and other means.

• Measures to stimulate increasing **ICT innovation** in the public and private sectors, with respect to hardware and software development and adaptation, as the basis for an information society.

• **Marketing Johannesburg** as an emerging ICT node with globally relevant assets including broadband services, human resources conversant with advanced information and communications technologies, and other assets to attract new employers.

## PART 2:        DISCUSSION OF POLICY CONTEXT

The report presented here is based on:

(a) a review of previous broadband studies for the City of Johannesburg 2006 – 2008; as well as the broadband strategies for the City of Cape Town and the KwaZulu-Natal provincial government;

(b) a review of the Electronic Communications Act No 36 of 2005 and the General Notice on Converted Licenses Notice 28 of 2009

(c) a brief review of literature on "connected cities", without repeating work that has been conducted for previous studies and the study on Internet Access in South Africa 2008

(d) discussions with the CoJ Department of Economic Development and Sector Support units; the Gauteng Shared Services Centre regarding the G-Link programme; and with telecommunications network operators and service providers

### 2.1     Policy context 1: Designing Johannesburg's digital future

The City of Johannesburg is committed to investing in the infrastructure and services required to be a highly developed global city.  Johannesburg is a highly concentrated economic area.  As a strongly services oriented economy, the city and its households and businesses exhibit high levels of demand for network infrastructures such as bulk water and sanitation, electricity and energy, transport networks and telecommunications networks.  In an era where Johannesburg is connecting to a globally networked 'knowledge' economy, large and small businesses, households and government services require access to high-speed broadband connectivity.

Broadband availability in South Africa is currently low, both in terms of access and speed.  Current broadband access was estimated at only 0.7 per 100 inhabitants (2006) for fixed line access, while 18.2% of households have a fixed line connection and 62.1% of the population over 16 years have mobile access (Gillwald & Stork, 2008).  The total number of broadband subscriptions in 2008 was 1.3 million (with dual usage), while the total number of unique users was 1.1 million and the total number of wireless broadband users was just more than 500 000 (no dual usage) (World Wide Worx, 2009: 74 – 75).  A review of service provider web advertising shows that download speeds of between 384kbps and 4 Mbps are available, with mobile access speeds up to 3.6Mbps.

Broadband access is generally sold as data bundles with an increasing price range up to 10 gigabytes. At prices generally above R500 per month for 3 gigabyte bundles, at relatively slow download speeds, South Africa is generally regarded as an expensive market for broadband, hence the continued low levels of broadband penetration relative to population size (World Wide Worx, 2008:46).

In order to address local needs and to retain its global positioning, Johannesburg wishes to become a 'digital city'. Thus the city administration envisages the evolution of high-speed digital networks over the next period of 20 years and more, to ensure broadband coverage for its more than one million households and several million firms and SMEs. Soweto alone has more than 200 000 small businesses. While the vast majority of these currently have turnovers of less than R10 000 per month, the aim is to grow them into businesses with turnovers in excess of R1 million a year (South Africa The Good News). Thus the city administration must give specific attention to the design of a policy and strategies that promote the future availability of high-speed networks for the majority of businesses and households, amongst other measures for promoting local economic development.

Noting the historical pricing of telecommunications access in the South African market as beyond the reach of many, and the view that broadband telecommunications network infrastructure is as important to economic development as tarred roads, water and sanitation, the City of Johannesburg considers the provision of high-speed backhaul networks and broadband core networks as infrastructure which can create multiplier effects. The city administration will, therefore, take the necessary actions to create opportunities for entrepreneurs to build the full-scale operating environment required for a digital city with maximal ICT usage.

Figure 1: Creating the Networks for an Information Society
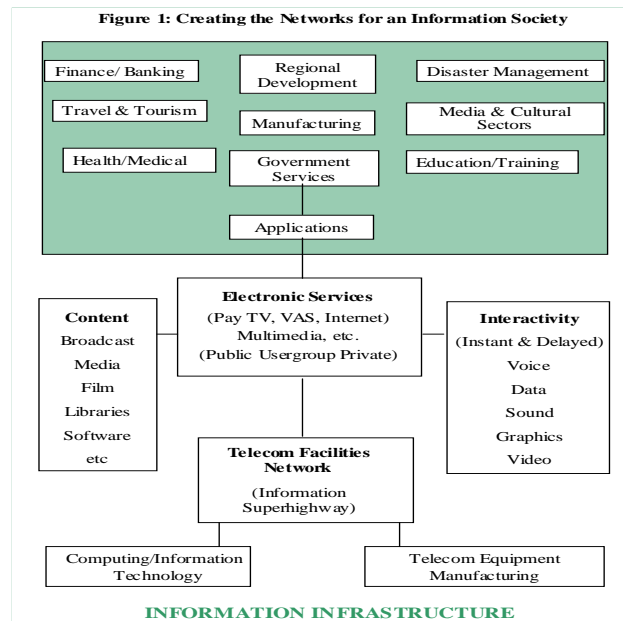
*Source: Melody, W (2003) International Handbook of Telecommunications Economics V.3*

The starting point for consideration of city-level broadband policy relates to the needs of citizens, businesses and public institutions for high bandwidth Internet access that enables rapid transmission of data and triple-play of voice, data and video. High-speed Internet access is required for institutions and economic sectors that are users of large, electronically transmitted data volumes, and want high upload and download speeds. Approaching the second decade of the 21st century, increasing numbers of institutions are reliant on such large data volumes for operating their businesses. This includes such diverse institutions as banks, schools and hospitals. The financial services sector, the business process outsourcing (BPO) and call centre business, Johannesburg's public universities and FET colleges, all exhibit high demand for bandwidth, but currently use high cost private sector infrastructure and services – where it is available. Community access, putting public schools online and providing connectivity for SMEs will create additional demand for bandwidth. While bandwidth is generally expensive for this segment of society relative to income, the City can either (a) build municipal broadband networks (b) facilitate private sector infrastructure provision to the greatest extent possible and/or (c) build and make available infrastructure in those spaces where the private sector will not go, in order to address the needs of low-income communities and the broad public service.

This perspective is well represented in the Melody diagram above: Creating Networks for an Information Society. The diagram illustrates the major components of the information society as being the information infrastructure (including the telecom facilities network, the electronic services providers and the content industry), and the superstructure (including the infrastructure in a wide range of fields from finance to health and culture).

While high-speed bandwidth has been in demand for a number of years and far exceeds supply and affordability, the emerging demand is for heightened mobility, where users can access the Internet while constantly moving from one site of economic or social activity to another, and using any device whether a laptop computer or mobile phone. Digital cities in formation, including London, Tokyo and Philadelphia, are experiencing differing levels of success or failure.  London is focusing on the availability of superfast, next generation broadband with speeds of 40Mbps and higher (Broadband Choices, nd), making available fibre-to-the-curb.  This approach will enable triple play, in other words the capacity for high-speed Internet access (data), TV (video) and telephone (voice) through a single broadband connection and quadruple play, adding wireless or other services to this package.

The City of Johannesburg must focus on the needs of its residents for broadband (demand-side) and providing an enabling environment for the future design of 'next generation networks' (supply-side), as demand and supply need to achieve some degree of alignment, albeit in a complex and unexplored terrain.  Next generation networks (NGN) are a way of framing the technological context for advanced networks which incorporate telecommunications networks (PSTN) and data networks, such as broadband, both for the purposes of high-speed access and for 'generalised mobility' (ITU, 2004) and NGN is therefore an important concept for this policy.

The level of demand for 'municipal broadband' will depend on changes in the national telecommunications landscape.  South Africa could see increasing competition and competitive pricing of broadband services, based on a number of changes in the landscape, including the licence conversions and award of individual and class electronic communications network services (ECNS) licenses by ICASA in January 2009 (Government Gazette, 2009; ISPA interview, 2009).  While it is unlikely that the vast majority of smaller players will acquire the necessary capital and other resources to

compete with the major fixed and mobile operators, they may nevertheless enter the market in a variety of ways.

Another development that may affect pricing in the broadband market is the competition emerging in the international bandwidth market. According to the President of Seacom, '*With only eight months to go before the system is ready for service, SEACOM remains set to be the first cable to connect east and southern Africa to the rest of the world with plentiful and inexpensive bandwidth* (Seacom, November 2008).

If municipalities are to become key players in any aspect of broadband provisioning, they must explore the best possible ways of stimulating the building broadband networks and of promoting pricing at affordable levels. There are a few options for municipal broadband. One option is to constitute a set of partnerships by working with, inter alia, the fixed line network providers, the mobile network providers, the Gauteng Provincial Government G-Link initiative and the international undersea cable companies. Linkages and partnerships with the municipal governments of Tshwane and Ekurhuleni to explore the financial and other benefits of co-operation will be an important policy principle. Given the expense of building broadband infrastructure and services from a low base, the initiative will be most likely to reach fruition if there is explicit collaboration amongst the municipal and provincial governments.

The future provision of telecommunications infrastructure and facilities for the businesses, residents, governmental and non-governmental agencies of the City of Johannesburg requires attention to next generation networks which enable inter alia, access to broadband networks and services that encourage and support mobility, quality of service and therefore utilization of the available infrastructure for promoting local economic development and social inclusion. Given the limitations of low speed networks, the business and residential demand for broadband as a platform for Internet connectivity has increased to the level where large cities such as Johannesburg need to evolve an environment that promotes affordable broadband access and quality.

To date the CoJ has prepared or commissioned a number of ICT s, including the Broadband Policy of March 2007 and the entitled "Designing Johannesburg's Digital

Future: Leveraging the 2010 ICT Legacy".  These documents have been reviewed and the key issues are summarised below.

### 2.1.1    Johannesburg Economic and Social Context

The CoJ local economic development (LED) environment pertinent to the adoption of a city broadband policy includes the financial and business services sector; the ICT and electronic sector; the wholesale and retail sector; the professional equipment sector; food and beverages manufacturing sector; creative industries sector; automotive components sector; tourism sector; a fledgling biotechnology and an underdeveloped other chemicals sector.  The city has large numbers of SMEs and public institutions.  In theory, all of these sectors and institutions can benefit to varying degrees from availability of affordable broadband services.

The key question that must be addressed is the design of a policy perspective that advances the City's objectives to provide advanced telecommunications infrastructure at affordable rates to the businesses and residents that operate and live within the boundaries of the metropolitan municipality, as well creating an environment for enabling access and competitive service provision by the range of players in the telecommunications market and with particular reference to BBBEE and SMME players.

As regards business access, attention should be given, inter alia, to the needs of high-end consumers such as the financial and retail services sectors; as well as to schools, hospitals and clinics, police and residential customers across a range of income levels. Furthermore, as a major destination for international business travel, for world class events such as the FIFA World Cup 2010™ and presence of its International Broadcast Centre, and the aim to be a 'world class city' which attracts international business and foreign direct investment, high-speed broadband telecommunications infrastructure and services is an important form of infrastructure for global attractiveness and competitiveness.  Equally important is the need for schools, universities and other government and non-governmental users to have access to hi-speed connectivity, for the purposes of accessing educational materials, or conducting on-line research, or transferring large data-sets, and simultaneous voice, data, video and broadcast or 'quadruple play'.

The CoJ has a considerable historical investment in telecommunications infrastructure and intends to see this infrastructure being upgraded and advanced on a continuous basis for the purposes of attractiveness, competitiveness and social advancement, whether through its own investment or through externally-funded investments. The adjacent metropolitan governments of Ekurhuleni and Tshwane, and the Gauteng Provincial Government, are all working on programmes to deliver high-speed broadband for economic and social benefits, hence the CoJ broadband policy will need to take cognizance of and where necessary, align with these corresponding approaches. Important lessons exist in the international environment, particularly in countries such as the United States of America, the United Kingdom and in Europe with regard to 'municipal broadband', as to the range of models, choices and dilemmas confronting municipalities who take on this task.

The CoJ Broadband Strategy Roadmap (BMI-T, 2005) discussed a number of key issues with respect to broadband provisioning. A Strategic ICT  presented to the City in 2007 (LINK, 2007) proposed a number of focus areas that require attention, in order to ensure that the ICT infrastructure provided for the 2010 FIFA World Cup™ enables the city administration to leverage the value of investments in the telecommunications network for the benefit of the current and future generations. Key recommendations from these studies are revisited in the context of the requirement for broadband policy and are adapted to this requirement:

- Establishing long-term ICT partnerships with major economic players in the city for exploring the benefits of investment in city-wide broadband.
- CoJ as enabling local government taking on the costs associated with utilization of rights of way as a means to developing faster broadband access.
- CoJ's role to aggregate demand and facilitate access.
- Asset register of the telecommunications assets (and ultimately the broader ICT assets) of the city, including the assets in both the private and public sectors.
- Regular meetings with key stakeholders in broadband provisioning including the ICASA.
- CoJ to focus on promoting online content for social and economic development across channels utilizing ICT infrastructure and services.

## 2.2    Policy Context 2: Trends in broadband infrastructure investment

This section gives an overview of the key developments in broadband infrastructure investment in South Africa and reflects briefly on the conversation between the CoJ on the one hand, and the Gauteng Provincial Government and the private sector on the other hand, in the preparation of this policy framework.

### 2.2.1    Private Sector infrastructure investment

Interviews with private sector network operators and services providers reveal that, for the City of Johannesburg, the urban landscape is attractive to both the fixed and mobile operators.   In the words of one operator, *'…(we) don't think there is anywhere in Johannesburg that we will not go with broadband …'* The logic here is that (a) Johannesburg has a relatively high density of medium-to high income households, and a concentration of business and government entities which are regarded as the market for content services that will require broadband; (b) the geographical landscape is not particularly challenging (mountainous, rugged) so the costs of infrastructure rollout can be kept within a limited range.  Despite this view, there are many complex issues to creating a digital skin around the city.

A number of operators revealed that they are investing in next generation technologies.  One area of immediate focus, though not the only one, is on putting in broadband 1.0 with the aim of making Internet access generally available, though as a contended, shared service, with no guaranteed quality of service (QoS), as there is no current protocol for QoS.  Over the next 5 years, broadband 2.0 will emerge in many countries including South Africa, as the supporting infrastructure for high quality, session-based services such as voice, video streaming, IPTV, video conferencing, becomes available.  While broadband 1.0 (asymmetrical upload and download speeds) is suitable for accessing web-based services; on the other hand this is not good enough for user-generated content, for e-learning in schools, for online social networking, for IPTV and video-on-demand.  These more advanced content services require consistent quality of service in the broadband link, namely symmetry in the up and down links. "There can't be contention ratios, everyone must be given the same speeds".

*This raises the issue of rapid technology change and the risk that policy and regulation typically does not (cannot) keep abreast with rapid changes in technology, the diffusion of new*

*technologies and the reshaping of the social and economic landscape through innovation and hence should remain technology neutral and broadly enabling..*

More countries use fibre-to-the-home (FTTH) as a preferred infrastructure in the access layer, because much of what is possible with fibre (speed, quality) is not possible with wireless, there will always be a lag. Since the copper local loop in South Africa has limits in terms of speed eg around 4 Mbps, optic fibre to the access layer and wireless to the desktop is a possible means of addressing the technology barriers to speeds in excess of 4Mbps.

*This raises the issue of the relationship between technology choices and the value that the user derives in terms of the performance of the infrastructure.*

Another barrier is the sheer size of the demand. Deployment of fibre services comes at an estimated cost of around R450 per metre, hence the challenge is balancing the cost of deployment against the cost of recovery.

*This raises the question whether there are particular ways in which the municipality can reduce the cost of infrastructure rollout to the operator and whether and how it can 'guarantee' that these savings are passed on to the consumer. Since costing and pricing is based on national rates, it is unlikely that market facilitation in one city alone will have a downward effect on prices. Nevertheless, the city administration can explore possible innovations in reducing the cost of broadband access within the city limits.*

### 2.2.2   Provincial Government broadband programmes and investments

The G-Link programme of the Gauteng provincial government aims to develop a broadband network for 95% of the local population to gain affordable, basic access to broadband. For priority townships, business and industry, the programme will provide 'rich media' broadband for applications that would benefit from bandwidth greater than 5Mbps. The G-Link business plan adopts an 'orchestration model', namely collaboration with local, district and metropolitan municipalities to utilise existing assets in the province-wide network. It envisages the broadband value chain as including backhaul infrastructure (high sites, ducts, etc), the broadband core network, the broadband access network or last mile, and aims to promote an open access approach to network infrastructure. Hence, it intends to create an environment in which government is provider and operator on the backhaul infrastructure and provider and operator on the last mile. The business model sets the purpose of the

infrastructure investment as being to build a content delivery network, with public sector provided content and introducing a crowd sourcing approach for up to 90% of the content.  This content distribution network would be one of the areas where SMEs can operate, both at the last mile and at the content delivery phase.  Electronic communications network services (ECNS) licensees will be invited to participate in building the core and distribution networks.

The network architecture orchestration model set out in the Integrated Business Plan sees the Johannesburg (CoJ), Ekurhuleni (EMM) and Tshwane metros broadband assets or available infrastructure as providing significant components of the provincial broadband network, with G-Link providing interconnection in the spaces between metros and continuity of services across the network.  G-Link will propose cross-utilisation of infrastructure where it exists and build infrastructure where it does not exist.  The executing mechanism for the G-Link network is a special purpose vehicle (SPV).  A formal engagement with metros to validate metro information will be undertaken in order to validate financial modelling.

In terms of access, at the last inch, WiMAX is envisaged for in home presence ie access mechanisms for users, utilising set top boxes and mobile technology.  The last mile and the last inch are envisaged as the space for SME and BBBEE players.

Relationship management for policy effectiveness and regular review and policy reform are regarded as important components of long-term network development and migration to new network technologies by the GPG.

## 2.3    Policy Context 3: Issues in Broadband Policy

The following section discusses major considerations to inform broadband policy for the City of Johannesburg.  While the discussion is not exhaustive, it does highlight issues relating to economic choices and social imperatives. It provides a perspective on varying approaches and lessons learnt

### 2.3.1   Market efficiency and smart incentives

In any society, the existing level of access and network reach is a function of a number of factors, including affordability and availability.  As affordability falls, for

example due to low income levels or other poverty measures and geographic isolation increases, levels of network reach and access tend to decline, due to the unwillingness of operators and service providers to cover these areas.  This creates an access gap. Research suggests that the access gap has a number of components, which include a market efficiency gap, a smart incentive zone and the true access gap.
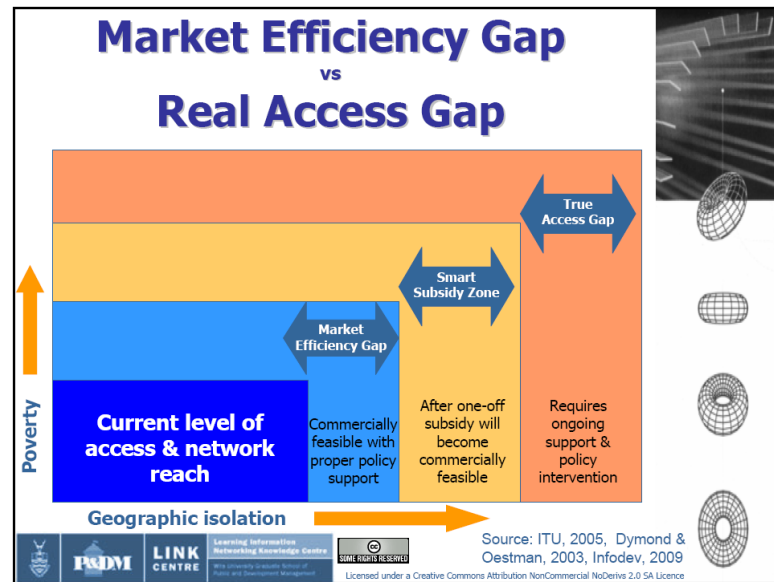


The market efficiency gap refers to that environment where operators and service providers may be encouraged to extend networks if public policy is supportive. The smart incentive or 'smart subsidy zone' refers to a category of incentives which will encourage firms and households to get on to the network, but where long-term financial support is not required and further network extension becomes commercially viable.  This includes measures such as once-off subsidies for a network connection or rate rebates for property owners and a range of other incentives which can be designed based on the particular socio-economic context.

The 'true access gap' refers to that part of the population and/or the local geography which requires ongoing support of a policy or financial nature or both, where commercial viability is unlikely to develop in the medium to long term.  In this 'real access gap' the public sector tends to step in through publicly-funded programmes for network extension or other mechanisms.

Policy-makers have to consider and address the needs of communities who may otherwise be excluded from access to the network, where such access has the potential to offer consumer or business value. Policy-makers have to balance these considerations against the capacity of public sector budgets to fund infrastructure and services on either a commercial or a non-commercial basis.

### 2.3.2    Open access infrastructure models and approaches

The concepts of 'open access' as they apply to network infrastructure and broadband relate to the value that can be obtained from approaches to 'national infrastructure sharing' (Cohen & Southwood, 2008); and includes 'open availability of fiber optic infrastructure' and 'neutral broadband infrastructure' (Alexiou, Bouras & Primpas, 2009); as well as 'competition in the network', 'open architecture' and 'carrier neutrality' (World Bank *info*Dev, 2005).

National infrastructure sharing approaches aim to create environments within which increasing competition, greater business and household telecommunications usage and affordable pricing is fostered. Achieving these goals involves a multiplicity of policy actors and actions, only some of which are applicable in the local government context. Cohen and Southwood (p 35) offer specific advice to local government as follows:

> *'…assist operators with facilitating rights of way and access to ducts and poles; set up a clearing point for rights of way if multiple agencies are responsible for rights of way at different parts of the network; provide information such as site surveys and geographic information systems for public land; speed up the processes for granting rights of way; reduce the costs to operators for obtaining rights of way'.*

Open availability refers to '*open (access) to any telecommunication carrier or service provider*', while neutral broadband infrastructure means that the infrastructure is made available to network operators and services providers '*with absolutely no discriminations against them*' (Alexiou, et al, 2009) implying that competitors can access the infrastructure on a non-discriminatory basis as regards cost, quality and the capacity of the technologies to provide a platform for electronic communications to large numbers of operators and service providers. This is where the need for competition in the layers of the network emerges for the purpose of encouraging the introduction of a

sufficiently wide array of technologies, as referred to by Cohen and Southwood (2008: 6), based on the *info*Dev Open Access Report, 2005:

> *'Open access means the creation of competition in all layers of the network allowing a wide variety of physical networks and applications to interact in an open architecture. Simply put, anyone can connect to anyone in a technology-neutral framework that encourages innovative, low-cost delivery to users. It encourages market entry from smaller, local companies and seeks to prevent any single entity from becoming dominant…'.*

Hogendorn (2006) adds the notion of 'net neutrality', arguing that the above quoted concepts of open access at the network level may be insufficient to ensure that there is access to the widest possible range of content, when content is a major factor in bringing users on to the network.

### 2.3.3    The paradigm of next generation networks

Next Generation Networks (NGN) refers to convergence of technologies and services across fixed, mobile and broadcast networks (ITU-T Y2001, 2004) and across telecommunications and data networks. New ITU technology standards are constantly in development and in December 2008 the ITU released a new standard for high speed networks that will enable 'high quality multimedia over phone, power, coaxial and other home wiring' (Johnson, 2008). New devices will be manufactured to comply with this or other emerging standards, so policy needs to foresee future radical changes in the market. *"There's a clear market need for a unified networking approach," … "With G.hn, every wire in every home around the world can become part of a home entertainment network. This will enable seamless communication between computers, HDTVs and telephones over existing wires. I expect that this exciting new technology will also foster innovations such as energy efficient smart appliances, home automation and telemedicine devices."*

According to the infoDev and ITU (2007: 5) '*Policies and regulations that were appropriate in the first phase of telecom reform far too often become major barriers to achieving further development of networks and services*.' Hence, this CoJ policy framework must offer a sufficiently large envelope for telecom provision and reform within the context of broadband and next generation networks, while maintaining technology neutrality.

### 2.3.4    Focus on 'who you are'

The KwaZulu-Natal broadband strategy focuses on the utilisation of applications to address socio-economic issues, and on logistics and supply chain management – as these are the major challenges for development in the province (KZN DED, 2007b).  The province has not yet approved the size of funding for this long-term initiative, but is currently conducting a demand side study (Nadasen, 2009).  The City of Cape Town (Council decision, 2007) has approved a R299m investment in the construction of fibre-optic cable for the city, with the intention of leveraging one-sixth of these funds from the national investment in the South African National Research Network (SANReN).  These approaches utilise a contextual perspective to render a very difficult strategy and investment decision more manageable and more fundable.

### 2.3.5    Green ICT

Environmental concerns are a key issue for policy consideration across many policy domains, ICT included.  The *Connected Urban Development Global Conference* viewed broadband deployment from the point of view of connecting the activities of the cities and their residents balanced against ecological sustainability and responsibility in cities, with attention to the built environment, energy, mobility and ICT.  It observed that ICT is '*both an environmental problem and an enabler of environmental benefits, but lacks a common framework for data, performance metrics, and solution sets for urban sustainability*' (CUD 2008c). It sought to discuss and debate measures for long term policies to manage the environmental impacts of ICT while utilizing these technologies to create cities for the future.  Issues for attention included the negative ICT environmental footprint associated with, inter alia, consumption of increasing amounts of energy and creating '*escalating volumes of solid and toxic waste* ' (ibid.). Arguments were made to the effect that **Green ICT** planning is an important futuristic focus and cities must have a comprehensive vision and strategy for ICT that brings all organizations and communities into an environmentally friendly ecosystem.  This should be an important consideration for the City of Johannesburg, given its population, business and infrastructure density.

### 2.3.6    Telecommunications and issues relating to municipal rights-of-way

One of the key issues is access to municipal rights-of-way. The city administration requires that the policy spell out the detail for broadband provision in the CoJ, including the issues related to by-laws 'to regulate access of

telecommunications licensees or electronic communications operators to City property and assets' (CoJ Broadband RFP August 2008).  The argument here is that the prevailing legislation, the Electronic Communications Act 2005, does not envisage charging for rights-of-way.  The Electronic Communications Act, 2005, Section 4 provides extensive direction on rights-of-way, hence the City of Johannesburg can build on the platform created by the legislation and can offer rights-of-way at no charge, in order to encourage the widespread deployment of broadband and next generation networks across the 1644km$^2$ of the city.

It is noted that (a) telecommunications service providers already pay licence fees to ICASA; (b) ICASA regulates telecoms pricing and does not include fees for rights-of-way and (c) any charges would likely be incorporated into costing and pricing models thus feeding the charges through to the customer.

As regards usage of rights-of-way by operators and service providers, it is noted that public roads were designed for transport in a previous era.  In the emerging era of moving towards knowledge economies and information societies, a paradigm shift is occurring in the way we understand the value of infrastructure.  In this context, access by telecoms services providers to rights-of-way can facilitate network extension while not introducing additional cost factors into pricing models.  This approach is what is envisaged in the open access discussion highlighted in the brief overview above.  The main concerns for the city with regard to rights-of-way should be environmental reinframework and general environmental stewardship as discussed in the section on 'green ICT' above.

### 2.3.7    Policy Issues Summary

Invitations to ECNS licensees to build and operate networks, the municipality as anchor customer, other large users as customers, customer models, 'demand aggregating' as a means to encouraging business in the local geography, technology options, free access to rights-of-way, inviting the participation of the private sector and the not-for-profit sector working in collaboration as broadband providers, these are important issues to be addressed in the policy framework.

Business models where local government and user groups or clusters provide the basis for a commercial model by creating a stable market eg municipal policing,

emergency medical services, hospitality sector, then build specific community projects as an added layer using not-for-profit organizations, the appropriate blend of public and private investment to provide broadband connectivity throughout the city – these are additional important issues for deliberation that cannot be easily resolved in a policy framework, but may require establishment of a forum where these matters can be addressed.

## 2.4      Summation of the CoJ context

Given the activity in broadband at the national and provincial levels, the City of Johannesburg should consider (a) where to focus its broadband initiative and (b) how to relate to other players in the market.  Here a number of options arise, which have to be carefully assessed.  The CoJ can compete with other providers or collaborate with other providers.  It can address the broad spectrum of need or focus on community access and its own requirements alone.  Preferably, it should not duplicate what other providers are offering, but should look at the gaps in what the private sector, national government and the province is providing.  A number of questions should be posed in building a policy , of which a few questions are outlined below.

The design of the provincial broadband  is still in the early stages and the relationship to already existing municipal infrastructure across the three metropolitan municipalities is not yet clear.

Lastly, from the perspective of introducing the policy debate, it is important to note that the increasing demand for bandwidth is only one element of the emerging demand schema for telecommunications infrastructure that will service a 'digital city'. The demand is, inter alia, for 'generalized mobility' and quality of service, all of this collectively referred to as being important capabilities of 'next generation networks' or NGN (ITU, 2004).

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