The Economic Impact of a Metropolitan Broadband Network for the City of Cape Town

STRATEGIC ECONOMIC SOLUTIONS cc

Economic Analysis & Modelling

Prepared for the City of Cape Town

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Executive Summary

The City of Cape Town is in the process of evaluating the potential of installing its own broadband telecommunications network that it will use for its own internal communications and to deliver services. It is envisaged that not only will this network result in considerable cost savings for the City itself, but will also generate revenues by allowing other operators access to the network. Furthermore, it also has the potential to bring about significant economic benefits to the city at large. While the business case is currently in the process of being finalised the City wishes to better understand the potential economic benefits that such a network could generate.

The objective of this study was to identify, explore and, where possible, quantify the potential economic benefits that would be generated as a result of the proposed broadband network.

The initial starting point of the research was to conduct an international literature review. The purpose of such a review is two fold. First, is to determine the overall economic benefits that a city wide broadband network has had on other comparable cities. The intention was to identify potential benefits and extrapolate these benefits to the Cape Town economy at a generalised level. Second, is to establish and replicate international best practise for the analytical part of the study.

As part of ensuring that the benefits that are identified in the literature could be expected in the Cape Town context a limited number of firms were surveyed. The intention of the survey was to ask factual questions about current communication costs and constraints and determine views on potential productivity gains from high speed broadband.

International Experiences

According to the Broadband 2006 conference website, global broadband subscriber statistics were 200 million subscribers in February 2006 – this included Digital Subscriber Line (DSL), cable modem service, fixed wireless broadband and satellite broadband services. A MyADSL article on 3 October 2006 estimated that there were 300 000 broadband users in South Africa (excluding mobile 3G and wireless ISP subscribers). According to the International Telecommunication Union (ITU) as reported by the Internet World Stats website, there were 5.1 million internet users in South Africa in 2006. Broadband users therefore account for 5.9% of internet users in South Africa in 2006. The broadband penetration rate per person (as opposed to household) for 2006 can then be estimated as 0.6%.

There is a substantial body of literature that demonstrates the economic benefits of constructing an optic fibre infrastructure and then deploying that network within a city or region. Although, the economic impact studies founding in the literature are not always focussed on municipal open access models, they do provide the findings of the economic

contributions of the adoption broadband infrastructure by businesses to gross domestic product, productivity gains and business activities. Three areas were reviewed. These are Lake County, Florida, USA; South Dundas in Ontario, Canada; and Victoria in Australia.

- The impact of broadband on Lake County, Florida resulted in economic growth which was twice that of neighbouring counties.

- In South Dundas in Ontario, Canada a significant finding was that 79.2% of companies had either more business or lower costs because of broadband. In particular $2.8 million in commercial / industrial expansion was experienced. There was a CAD25.22 million increase in GDP for Dundas County;

- The economic benefits of broadband for the state of Queensland, Australia include increases in regional output of AUD3.160 million; an average 1,586 jobs created; contribution to telecommunications productivity of AUD1.440 million; contribution to productivity in other industries of AUD3.470 million; and expected to increase aggregate consumption of AUD492 million by 2018/9.

Expectations in Cape Town

As part of ensuring that the benefits that were identified in the literature could be expected in the Cape Town context a limited number of firms were identified and surveyed. The intention was to ask factual questions about current communication costs and constraints was well as determine views on potential productivity gains from high speed broadband.

The first part of the survey asked a number of factual questions about telecommunication costs. One of the key questions that was asked was the cost of land line phones as a percentage of turnover. While sixty five percent of firms reported that these costs were less than one percent of turnover, five percent reported them to be over thirty percent and another five percent as more than ten percent.

A question was asked about the cost of internet access. This proved to be less than land line telecommunication cost. Five percent of firms have internet costs that are greater than 10 percent of turnover. Another ten percent have costs greater than five percent of turnover. On the other hand fully half of all firms have internet costs that are less than one percent of turnover.

The second part of the survey asked questions about expected productivity gains as a result of affordable high speed broadband access. Firms were asked to what extent they would expect the productivity of their firm to change. The first of these questions asked about productivity gains as a result of increased download speeds. Fully thirty percent of firms expect that productivity would increase by more than ten percent with five percent of firms expecting an increase of forty percent. On the other hand twenty percent of firms did not expect any productivity increase because of faster download speeds.

One of the benefits of affordable broadband is the potential for people to work from home, at least for part of the time. This has major societal benefits in that there would be less traffic congestion, less vehicle emissions, provision for parking and noise reduction. While it was not possible to quantify these benefits, firms were asked if this potential opportunity would make them more productive or reduce costs. Twenty five percent of firms expected at least a five percent productivity increase. Of these five percent expected a thirty percent increase in productivity and another five percent expected a twenty percent increase in productivity. Very few firms expected that there would be no gain as a result of some staff being able to work from home.

Cost Benefit Analysis

Both a financial and an economic cost benefit analysis (CBA) were performed on the proposed broadband rollout. The financial and economic cost benefit analyses differ from conventional cost benefit analyses in that the impact on all the stakeholders within society are considered and not only those of the financing agent. The economic CBA then in turn differs from the financial CBA in that it shows the true cost to society.

Cost benefit analysis (CBA) uses three measures to judge whether a project is desirable. These are net present value (NPV), benefit cost ratio (BCR) and internal rate of return (IRR). A NPV shows the overall costs and benefits of a project over all future years in today's values. This is done by discounting future costs and benefits by 8% as specified by the Treasury. A positive NPV shows a project to be desirable. A BCR shows the value of benefits per rand of spending. So a project with a BCR greater than one is desirable and the higher the BCR the better the project. Finally an IRR is the discount rate which gives an NPV of zero. The higher the IRR the better the project. The difference between economic and financial CBAs is that the financial takes account of only monetary values while an economic CBA represents the true benefit (or cost) to society.

The results of the financial and the economic cost benefit analysis are presented in Table E1.

Table E1: Financial and Economic Cost Benefit Analysis Results

Financial NPV (Rm)	R 38,946	Economic NPV (Rm)	R 37,598
Financial BCR	10.3	Economic BCR	10.5
Financial IRR	129.6%	Economic IRR	137.2%

The financial cost benefit has a positive net present value (NPV) of R38.9bn, a benefit cost ratio (BCR) of 10.3 and an internal rate of return (IRR) of 129.6%. All these measures indicate that the broadband rollout project is very beneficial to society.

Similarly, the economic cost benefit analysis indicates an NPV of R37.6bn, a BCR of 10.5 and an IRR of 137.2%. While these values are slightly different to the financial CBA they all still indicate that the project is beneficial to society from an economic point of view. It is interesting to

note that while the economic NPV is lower than the financial NPV the economic BCR and IRR are higher than their financial counterparts.

Macroeconomic Analysis

While there are a number of different types of macroeconomic effects, the two most important are contribution to gross domestic product (GDP) and creation of jobs. The importance of job creation is obvious. Increases in GDP are synonymous with increases in peoples' economic standards of living. Increased GDP – i.e. increased production – is experienced in the form of more jobs, higher wages and reduced economic hardship. It is clearly an important measure.

- Capital expenditure could be expected to contribute between R127m and R266m to national GDP between 2007/08 and 2011/12 when the infrastructure is developed.

- The contribution from operations is expected to show a steady increase from R18m in 2007/08 to R515m 2026/27. All prices are given in 2007 prices and any increase in numbers is due to real growth.

- The major contribution to GDP though is the increase in productivity gains. This contribution is expected to increase from R170m in 2008/09 to R27.7bn in 2026/27.

- The total contribution to GDP is expected to amount to R225m in 2007/08, R483m in 2008/09 and R736m in 2009/10. Total contribution to GDP is then expected to increase to R28.2bn in 2026/27.

- GDP is important not just because it is income but also because income has the capacity to add to wealth. Based on these projections, the proposed broadband rollout would have made a cumulative contribution to GDP of R5.7 billion by 2011/12 when the majority of the infrastructure development will be complete. This cumulative total increases to over R211bn by 2026/27.

The proposed broadband rollout in Cape Town would result in changes to three types of jobs. The first are the direct jobs that would be created over the project period. These are jobs directly on infrastructure development, the construction of exchange facilities and operations. The second are the so-called indirect jobs that are due to multiplier effects of both the capital and operational costs of the public transport as well as from changes in transport usage and time savings. The third type of change in jobs results from the structural economic changes attributable to the proposed project as a result of cost savings and, particularly, productivity gains that would make Cape Town businesses more competitive.

- During the construction period anywhere between 273 and 560 people could be employed on a full time basis on the project. The number of people directly employed from operations is estimated to

increase from 25 in 2007/08 to 824 in 2026/27. Additional jobs would be created from productivity gains, increasing from 277 in 2008/09 to over 41 500 in 2026/27.

- The estimation of indirect jobs is based on the official South African input output tablesand should be treated as the upper bound of these estimates. Capital Expenditure would be responsible for creating 1 793 indirect jobs in 2007/08 and 2 273 indirect jobs in 2008/09. This number is then expected to decrease to 1 245 in 2011/12. The number of indirect jobs due to operational expenditure is expected to increase from 139 in 2007/08 to 4 413 in 2026/27. Productivity gains should see indirect jobs increase from 1 279 in 2008/09 to 205 170 in 2026/27.

- Total direct and indirect jobs are expected to amount to 2 412 in 2007/08 and 4 837 in 2008/09. It is expected that 14 828 direct and indirect jobs would be created in 2010 and nearly 252 000 by 2027.

Other macroeconomic benefits include:

- Capital formation is the value of plant that is needed to support the value of output. The degree to which a project can bring about additional capital formation is a function of the actual size of the project, the existence of limited capacity in the manufacturing sector and the degree of confidence in the future. The increased productivity that businesses would experience because of the broadband rollout would have an effect on gross fixed capital formation. It is estimated that this gross fixed capital formation would increase from R534m in 2007/08 to over R90bn in 2026/27.

- Total tax generation is expected to increase from R24m in 2007/08 to R2.9bn in 2026/27. When the majority of the capital expenditure will be complete in 2011/12 a cumulative total of R607m in taxes would have been generated by the project. The cumulative contribution to taxes by 2026/27 is expected to exceed R21.9bn.

- The project will also contribute to indirect household income. By 2026/27 it is expected that the project will have cumulatively added over R106bn to indirect household income.

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Abbreviations

BCR: Benefit cost ratio

BPO: Business process outsourcing

CBA: Cost benefit analysis

DSL: Digital Subscriber Line

DTI: Department of Trade and Industry

FTTB: Fibre to the building

FTTH: Fibre to the home

GGP: Gross Geographic Product

GSP: Gross State Product

IRR: Internal rate of return

ITIF: Information Technology and Innovation Foundation

MEIP: Market Economy Investors Principle

NPV: Net present value

OECD: Organisation for Economic Cooperation and Development

PPP: Public private partnership

SAM: Social accounting matrix

SLA: Service-level agreements

1 Introduction

The City of Cape Town is in the process of evaluating the potential of installing its own broadband telecommunications network that it will use for its own internal communications and to deliver services. It is envisaged that not only will this network result in considerable cost savings for the City itself, it will generate revenues by allowing other operators access to the network. It also has the potential to bring about significant economic benefits to the city at large. While the business case is currently in the process of being finalised the City wishes to better understand the potential economic benefits that such a network could generate.

The nature of the new economy in the Information Age is acknowledged by the City of Cape Town: "In the modern 'knowledge economy', the creation and use of information has become a central economic activity" (2007: 7). The City of Cape Town has also recognised that, within the liberalising South African telecommunications regime still under the market dominance of Telkom SA, a municipal open access model for broadband infrastructure and services is necessary to promote economic activity within the city and region. This model can be described as a "public service on commercial terms" where surplus fibre optic connections are leased from "a neutral network that is open to all players on equal terms" (City of Cape Town, 2007, drawing on www.stokab.se). In essence, the model proposes to lay optic fibre cable infrastructure within the Cape Town Metropole, the so-called "dark fibre" (or fibre without signal), to support the telecommunications and service delivery needs of the City of Cape Town's administration as well as provide opportunities for new entrants into the local telecommunications market to sell broadband to end-users. The justification of the municipal open access model is to increase competition, drive down the cost of voice, video and data services, and stimulate business innovation and economic activity within Cape Town. The municipal open access model is a market-driven rather than a regulatory mechanism to provide improved local telecommunications infrastructure and services.

Two recent articles, which appeared in South Africa trade and business publications, provide examples of the problems facing South African businesses due to differential access to bandwidth compared to international markets. These examples highlight the mitigating factors for the City of Cape's investment in open access dark fibre infrastructure.

Engineering News reported that a market study by Frost & Sullivan indicated that problems in the IT infrastructure outsourcing marketing was "due to high bandwidth costs" which resulted in service providers "being forced to increase their prices" (Olivier, 27 August 2007). *Business Day*, on the other hand, reported that the National Department of Trade and Industry's (the DTI) industry policy framework has forced Telkom to discount telecommunications prices for call centres operating in South Africa. The aim of the DTI is to stimulate foreign investment and job creation in the business process outsourcing sector by creating a pricing

regime competitive with other international markets (Le Roux, 3 September 2007).

The objective of this study is to identify, explore and, where possible, quantify the potential economic benefits that would be generated as a result of the proposed broadband network. The initial starting point of the research was to conduct an international literature review. The purpose of such a review is two fold. First, is to determine the overall economic benefits that a city wide broadband network has had on other comparable cities. The intention was to identify potential benefits and extrapolate these benefits to the Cape Town economy at a generalised level. Second, is to establish and replicate international best practise for the more detailed part of the study.

As part of ensuring that the benefits that are identified in the literature could be expected in the Cape Town context a limited number of firms were identified and surveyed. The intention of the survey was to ask factual questions about current communication costs and constraints and determine views on potential productivity gains from high speed broadband.

It will be shown that some of the benefits include:

- Underpinning the competitiveness and growth of a range of local industries that depend upon effective communications, including the call centre industry, financial services, insurance, design, film & media, and the ICT industry itself

- Stimulating the general improvement of the standard of computer literacy across the workforce

- Positioning Cape Town regionally and internationally as a 'smart city', capable of competing effectively in the global knowledge economy

- Helping to attract inward business investment, thus creating more job opportunities

It will be shown that the financial cost benefit has a positive net present value (NPV) of R38.9bn, a benefit cost ratio (BCR) of 10.3 and an internal rate of return (IRR) of 129.6%. All these measures indicate that the broadband rollout project is very beneficial to society. Similarly, the economic cost benefit analysis indicates an NPV of R37.6bn, a BCR of 10.5 and an IRR of 137.2%.

It will also be shown that the total contribution to GDP is expected to amount to R225m in 2007/08, R483m in 2008/09 and R736m in 2009/10. Total contribution to GDP is then expected to increase to R28.2bn in 2026/27. Based on these projections, the proposed broadband rollout would have made a cumulative contribution to GDP of R5.7 billion by 2011/12 when the majority of the infrastructure development will be complete. This cumulative total increases to over R211bn by 2026/27.

During the construction period anywhere between 273 and 560 people could be employed on a full time basis on the project. The number of people directly employed from operations is estimated to increase from 25 in 2007/08 to 824 in 2026/27. Additional jobs would be created from productivity gains, increasing from 277 in 2008/09 to over 41 500 in 2026/27. Total direct and indirect jobs are expected to amount to 2 412 in 2007/08 and 4 837 in 2008/09. It is expected that 14 828 direct and indirect jobs would be created in 2010 and nearly 252 000 by 2027.

This report has four sections:

Section one reports on the experiences with broadband elsewhere in the world and provides context for the rest of the report.

Section two gives the results of the limited survey that was done with a number of firms in Cape Town on their current telecommunication costs and their expectations about what affordable high speed broadband might do for their business.

Section three gives the results of the financial and economic cost benefit analysis that was performed.

Section four reports the likely macroeconomic impact of the proposed project.

Finally, section five concludes the report.

2 The Economic Impact of Broadband: International Experiences

The aim of this section is to provide an overview of selected international case studies and demonstrate the overall economic benefits that a city wide broadband network has had on other cities. This was intended to inform the methodological approach of this analysis.

2.1 Broadband access in international perspective

According to the Broadband 2006 conference website, global broadband subscriber statistics were 200 million subscribers in February 2006 – this included Digital Subscriber Line (DSL), cable modem service, fixed wireless broadband and satellite broadband services. It was estimated that there would be a growth rate of 3.7 million new subscribers per month for the remainder of 2006. It was forecasted that there will be 413 million broadband subscribers by 2010 (see Broadband 2006).

The Organisation for Economic Cooperation and Development (OECD) reported in December 2006 the worldwide segmentation of the usage of broadband technologies as favouring DSL over other forms of broadband access. The breakdown per technology was: DSL - 62%, cable modem - 29%, fibre to the home (FTTH) / fibre to the building (FTTB) - 7%, and other (such as satellite, fixed wireless, and power line communication) - 2% (OECD, 2006).

Websiteoptimization.com (2007), in distilling data from other sources such as the research house point Topic, reported that "at the high end of the broadband spectrum, South Korea retains its lead over Hong Kong, Monaco, and Iceland in household broadband penetration" in comparison to 2006. Further, it was noted that growth rates in Hong Kong would see it eclipse South Korea later in 2007 as the country with the highest broadband penetration. South Africa does not feature within the top twenty countries surveyed. Within the top 30 list of OECD countries, Mexico is the only developing/transitional economy (OECD, 2007).

A MyADSL article on 3 October 2006 estimated that there were 300 000 broadband users in South Africa (excluding mobile 3G and wireless ISP subscribers). According to the International Telecommunication Union (ITU) as reported by the Internet World Stats website, there were 5.1 million internet users in South Africa in 2006. Broadband users therefore account for 5.9% of Internet users in South Africa in 2006. The broadband penetration rate per person (as opposed to household) for 2006 can then be estimated as 0.6%.

Another means of comparing broadband penetration per country has been compiled by the Information Technology and Innovation Foundation (ITIF) from OECD data. The ITIF index, as shown in Table 1 below, draws on broadband penetration per household per country along with the average speed of broadband in Mbps on offer in the country as well as the pricing of 1 Mbps on the fastest available broadband technology. The ITIF index

seems to provide the most effective means of benchmarking countries. The methodology could also be applied to comparative city broadband penetration studies.

Table 1: ITIF Broadband index Top 20 Countries

Rank	Country	Penetration Subscribers per Household	Average Speed (Mbps)	Price / Month for 1 Mbps, Fastest Technology (USD PPP)	Overall Score
1	Korea	0.90	45.6	0.45	15.73
2	Japan	0.52	61.0	0.27	14.99
3	Iceland	0.83	6.0	4.99	12.14
4	Finland	0.57	21.7	2.77	12.11
5	Netherlands	0.73	8.8	4.31	11.87
6	Sweden	0.49	18.2	0.63	11.54
7	France	0.49	17.6	1.64	11.41
8	Denmark	0.70	4.6	4.92	11.37
9	Norway	0.64	7.4	4.04	11.29
10	Canada	0.62	7.6	6.50	11.11
11	Belgium	0.54	6.2	6.69	10.60
12	US	0.51	4.8	3.33	10.47
13	Switzerland	0.68	2.3	21.71	10.40
14	Australia	0.50	1.7	2.39	10.23
15	Austria	0.42	7.3	5.99	10.08
16	Portugal	0.42	8.1	10.99	9.92
17	UK	0.50	2.6	11.02	9.92
18	Germany	0.38	6.0	5.20	9.81
19	Italy	0.38	4.2	3.36	9.78
20	Luxembourg	0.51	3.1	18.48	9.71

Source: Websiteoptimization.com (2007)

Statistics available from South Korea for April 2007 shows Seoul as the most connected city in the world. There is almost universal broadband access for Seoul's 3,312,858 households. This is a direct result of the Digital Media City project driven by Seoul metropolitan government over the last eight years. While this figure is in itself significant, it should be noted that the total average percentage broadband access per household across all sixteen Korean cities cited was 89% (Townsend, 2007). This data puts some perspective on the possibilities for benchmarking broadband access in municipal areas.

If Seoul is the world's most connected city, then which other cities are leading the broadband access standings? A recent feature in the *Daily Wireless* places five in Asia, three in Europe, and Silicon Valley in the United States of America where "through a blend of private and public investment, [these] cities have had remarkable success in providing almost complete connectivity throughout their city limits. For residents in these cities, high-speed access is available almost anywhere and at any time, and often for below-market rates" (*Daily Wireless*, 6 March 2007).

Although it is difficult to ascertain comparative data, Table 2 below attempts to set out key factors – household penetration rates, costs of broadband services, and key market drivers - as determined from 2006 data to facilitate comparison between cities.

Table 2: Top Connected Cities in 2006

City	Population	Broadband household (National Avg)	Costs (USD 1 ≈ ZAR 7.20) Exchange rate as at 01-Sep-07	Key market drivers
Seoul (South Korea)	+ 22 million	83%	R144 / month for 10Mpbs connection. R216 / month for commercial Internet speeds of + 100Mbps.	Consumer demand for PC gaming.
Taipei (Taiwan)	2.6 million	90%	R32 to R86 / month.	Near-ubiquitous Internet access via WiFi network and free web services to public (email, pay city service bills online, and Internet skills training).
Tokyo (Japan)	12.5 million	63% (estimate)	R360 / month for 100Mbps VDSL from Nippon Telegraph and Telephone. R648 / month for 1Gbps FTTH from Kansai Electric Power.	Business demand for web conferencing and VoIP calls.
Hong Kong (China)	6.9 million	87%	R115 / month for 10Mbps residential connection from Hong Kong R245 / month for 100Mbps connection from HKBN.	Supply of broadband TV service by HKBN as well as VoIP services by telephony providers.
Singapore (A City-State)	4.5 million	65%	R554 / month for 30Mbps connection. Free 4Mpbs from StarHub (some restrictions)	ICT as driver for economic development of city.
Stockholm (Sweden)	1.5 million	65% (i.e above national average)	R360 / month for 24Mpbs service (requires a R144 / month cell phone contract).	PC gaming at cyber cafés (recreational use of Internet) and roll-out of WiMAX wireless grids by the city.
Paris (France)	2.2 million	50% (i.e above national average)	R324 / month for 18Mbps connection from France Télécom. R648 for 2.5Gbps downstream speeds via optical network from France	Competition between local ISPs and demand for VoIP and digital TV.
Shoreditch, in east London (England)	207,000	2,000 residents and 1,000 businesses	R288 to R575 / month for 8Mbps connection.	Digital Bridge aims to reduce crime (via CCTV) and improve quality of life using IPTV (phone and community e-services).

Source: Daily Wireless (2007), OECD (2206). Note: USA examples excluded as cover several city areas.

The above city and country statistics provide useful methodological measures for the City of Cape Town to develop a monitoring and evaluation framework to benchmark the penetration of broadband access per citizen, household or business within the Cape Town metropolitan area. A Cape Town Broadband Penetration Index could include the following indices:

- Household penetration;
- Average speed in Mbps; and
- Cost per 1Mbps in USD PPP (the purchasing power parity value).

This Cape Town Broadband Penetration Index would offer both comparative data to other cities as well provide a metric for reporting to council and the public on the leverage ratio of the Municipal Open Access

Model (that is, the Rand value of the dark fibre infrastructure investment per citizen with access to broadband).

2.2 Municipal open access models

This section sets out some of the lessons to be learnt about municipal open access models.

In November 2006 an international conference titled Broadband Cities 2006 was held in Stockholm, Sweden. The conference brought together several speakers from city programmes operating variations of the open access models – amongst others: CityNet (Amsterdam, The Netherlands), DevEnter (Deventer, The Netherlands), PortoDigital (Recife, Brazil), Reykjavik Energy (Seltjarnarnes, Iceland), the Network Co-operative Kuuskaista's focus on rural villages (South Ostrobothnia, Finland) and UTOPIA (Utah, USA). The conference provided a platform to discuss the following key topics:

- How can open access infrastructures and technologies support local economic development (that is, innovation, growth and fair competition)?

- How can the "real" broadband promise of faster connectivity create the potential for new or innovative products and services within the public and private sectors?

- How can broadband contribute to the improvement of the quality of citizens' lives?

It is important to note these issues were discussed, and best practices shared, at the international level and among those driving the open public local access network model at the municipal level. It also points to the global relevance, and timeous intervention in the local economy, of the City of Cape Town's construction of dark fibre infrastructure.

The priority areas for these open access initiatives echo the direction taken by the Dutch government in a strategy document entitled: *The Broadband Paper: A question of pace and better utilisation* (Ministry of Economic Development, 2004), that is; government's priority in utilising broadband infrastructure should focus on the public service areas of "education, care, security and transport." As explained by the Ministry, an open access broadband strategy should:

- Implement broadband-type services and networks for education;

- Ensure effective, high quality medical and social care that will remain affordable and accessible in the future;

- Provide a safe social living environment, supported by ICT and networks; and

- Provide for the availability of digital facilities that contributes towards improved access and avoids unnecessary mobility.

According to the Dutch Ministry of Economic Development (2004: 5) these strategic areas provide the framework for government interventions in developing the knowledge economy at the local level.

1.1.1 The White Light District – Amsterdam, The Netherlands

Building on the section above, and to provide further insights into the nature of city-wide municipal open access programmes, the case study of the City of Amsterdam's initiative is set out below. The White Light District in Amsterdam, as it is colloquially known, is operated by CityNet (www.citynet.nl), a programme under the auspices of the City of Amsterdam (see Van der Woude, 2006 and Unstrung, 2007). The initiative was launched in October 2006 and aims to roll out 40,000 FTTH connections with 100Mbps speeds in Amsterdam and, thus, to provide broadband access to 450,000 homes by 2010.

The network itself is owned within a public private partnership (PPP) of GNA BV (GNA Ltd), a private company owned by ING Real Estate and Reggefiber, five housing corporations and the City of Amsterdam. The City of Amsterdam has invested €6 million of the €30 million in the project. In this way, the City of Amsterdam adheres to the European Union's Market Economy Investors Principle (MEIP) of no state support in telecommunications infrastructure development. The City's primarily role as an investor is to ensure compliance with the internal regulation of providing an open access network model to the market.

The dark fibre infrastructure is leased to the wholesale broadband supplier BBned (www.bbned.nl), a wholly-owned Netherlands subsidiary of Telecom Italia. BBned won the 2005 tender for the project. BBned sells capacity "on equal terms" to companies providing services to end users (largely, consumers and small businesses). The City of Amsterdam does not gain preferential rates for its own use of the network from the BBned. BBned is working with a business model that will provide them with a return on their investment within a four year period, thereby competing effectively with other ADSL and cable broadband providers in Amsterdam.

The cost to an end-user for broadband services is €50 (ZAR 494) per month inclusive of VAT. The CityNet business model splits all revenues equally three ways. A third party service provider offering end-user broadband service can therefore expect to net an income of €14 (ZAR 138) per subscriber. According to Unstrung (2007), "a typical package for a residential user might comprise 30Mbps Internet access, a flat fee for voice, plus 50 channels of digital TV."

There are already reports that access to broadband is stimulating new business services in the city. For example, fabchannel.com "plans to stream concerts and events from theatres and other venues in the city." Another arts and culture initiative "plans to stream, free of charge, the first 15 minutes of a play as a teaser, [as] a means of enticing people to then book for a full theatre performance" (Unstrung 2007). Furthermore, it is envisioned that "bandwidth underpinned by service-level agreements (SLAs) will allow a range of services targeted at small and medium-sized

enterprises, such as VPNs and applications including videoconferencing and IP-based video security."

The CityNet's economic and political justification of embarking on the open access network model was announced in a November 2005 press release:

"[With CityNet] we [take] a big step towards the deployment of a citywide fiber-to-the-home network. This enables our city to compete with other European cities. The fibre network delivers to Amsterdam an innovative and freely accessible open infrastructure, suitable to support growth in demand for the next 30 years or more. In this way we ensure a wide open marketplace for innovative service-providers and economic growth, as well as a fast track for the smarter and cheaper delivery of care, education and other public services" (from Van der Woude 2006).

1.1.2 The *Broadband Manifesto* and the future of open access models

The next step from a municipal open access model is to create open networks connecting the infrastructure (and open access initiatives) of several cities into a single regional network (see Stedenlink, 2006). This is the vision of the *Broadband Manifesto,* which was launched in October 2005 by the TeleCities, the Knowledge Society Forum of Eurocities, the local government network for European countries (see appendix 1). The Broadband Manifesto "embraces high speed secure networks as an engine of economic and social urban development" similar to that of treating roads, sewer and energy infrastructures as public benefit assets (Broadband Manifesto, 2005).

The three key principles called for in the *Broadband Manifesto* deserve mention:

- There can be no knowledge society in a city without broadband and broadband services;
- There can be no broadband services without fibre optics, as "passive" fibre optics are the "only future-proof infrastructure" for a city; and
- Open access for all citizens can only be obtained by means of a fibre optics network independent of the services offered. These services, however, should be affordable and widely accessible within a market system.

These principles look to the cities of the future where open access broadband is used for public services to address economic, social and environmental sustainability and make cities more appealing as places to live, work and play. For example, the Clinton Global Initiative is funding Cisco's "Connected Urban Development" initiative to provide the cities of Amsterdam, Seoul, and San Francisco with strategies that use the implementation of broadband infrastructure to develop public services aimed at reducing carbon emissions by providing, for instance, dynamic traffic management. These principles also remind us of our need to

quantify on the provision of dark fibre infrastructure within the context of local municipal governance and the need to ensure transparency in reporting on local economy development resulting from affordable and open broadband access.

2.3 The economic benefits of dark fibre

There is a substantial body of literature that demonstrates the economic benefits of constructing an optic fibre infrastructure and then deploying that network within a city or region. Although, the economic impact studies founding in the literature are not purposely focused on a municipal open access model, they do provide methods and finding of the economic contributions of the adoption broadband infrastructure by businesses to gross domestic product, productivity gains and business activities.

Four case studies, informing the econometric model used for the study of the impact of affordable broadband on Cape Town's economy, receive attention here, namely:

- Lake County, Florida, USA;
- South Dundas in Ontario, Canada;
- Queensland, Australia; and
- Victoria, Australia.

1.1.3 Lake County – Florida, USA

Ford and Koutsky (2005) provide a comprehensive economic analysis of the impact of broadband on Lake County, Florida in the USA. Their study "shows that Lake County has experienced approximately 100% greater growth in economic activity relative to comparable Florida counties since making its municipal broadband network generally available to businesses in the county" (2005: 15).

In 2001 the Lake County administration began providing access to its fibre optic network for its 250,000 residents, public benefit organisations (such as schools and hospitals), and businesses. The model it used was the leasing of the multi-million dollar infrastructure to private network providers, who then sold services to end-users. For example, the "Lake-Sumter Community College uses the municipal fibre network to deliver its educational television station to the local cable television company' (2005: 4).

Based on the data they collected they have been able to argue that "broadband infrastructure can be a significant contributor to economic growth" with "positive, public benefits on the economy" (2005: 15). Furthermore, they see the municipal investment in broadband as comparable to the provision of municipal infrastructure, such as roads, hospital and parks, with a "public purpose". Their study was also used as an argument against several bills pending before the Florida legislature that aimed at restricting municipal broadband investment.

1.1.4 South Dundas – Ontario, Canada

The Strategic Networks Group (2003) study of South Dundas in Ontario, Canada provides further quantifiable data justifying the need for rolling out broadband infrastructure within a metropolitan area.

Key findings for the period June 2001 to April 2003 were that "economic effects can be directly attributed to the fibre network in South Dundas" (Strategic Networks Group, 2003: 3). A significant finding was that 79.2% of companies "reported an increase in business or a decrease in costs due to their use of the optic fibre network" (2003: 12). In particular $2.8 million in commercial / industrial expansion was experienced.

The Township of South Dundas has made CAD1.3 million investment in the dark fibre network by 2003. The Strategic Networks Group demonstrated that a return on that investment was made in terms of the direct and indirect economic impacts on the city and region, namely:

- There was a CAD25.22 million increase in GDP for Dundas County;
- 207 person years of employment for Dundas County; and
- There was a CAD3.5 million increase in provincial tax revenues and a CAD4.5 million increase in federal tax revenues.

Further findings also provided a link between the use of broadband technology and job growth. 50.0% of businesses with broadband access to the internet experienced job growth. More specifically, of all firms using the fibre network, 54.2% experienced job growth. The study compared these broadband impacts on job creation against controls of businesses with dial-up Internet access and those businesses without Internet access. Businesses with access to the internet experienced 27.0% in job growth, while businesses with no internet experienced job growth of 5.6% (2003: 3-4).

1.1.5 Brisbane and Moreton – Queensland, Australia

The Allen Consulting Group (2003) reported on the economic benefits of broadband for the state of Queensland, Australia. The report focused the major urban centres of Brisbane and Moreton to extrapolate the impacts for Queensland's regional economic development.

The report found that the "open access true broadband network", that is, a model that "leaves the network operation in the hands of a neutral carrier, while it was open for a number of retailers to offer a range of different services that would be carried over the network" would "introduce more choice and innovation in the bundles of services offered or carried over the network with even more competitive prices" and as a result "stimulate faster subscriber take-up and use of the network" (2003: vi).

The study envisioned that an open access broadband network would offer the following positive economic impacts for the region (2003: 25):

- Expanding communications activities via development of new business activities, including new employment opportunities;
- Stimulating competition within the telecommunications sector, especially among Internet Service Providers;
- Productivity gains from using broadband in business; and
- Competitive gains for industries "dependent upon affordable broadband Internet access."

The cost of rolling out a fibre optic network (inclusive of the backbone, hardware, software and FTTH installation costs) was AUD850 million over four years (2003: 9). The network's proposed coverage was 50% by 2008, providing 480,000 households and 60,000 businesses with access to broadband connectivity (2003: 7).

The Allen Consulting Group's economic modelling (2003: 16, 17 and 20) demonstrated that there would be the following gains over a fifteen year period:

- Increases in regional output of AUD3.160 million;
- An average 1,586 jobs created;
- Contribution to telecommunications productivity of AUD1.440 million;
- Contribution to productivity in other industries of AUD3.470 million; and
- Increased aggregate consumption of AUD492 million by 2018/9.

The report concluded that these economic impacts "far exceed the initial investment costs required to finance the network" (2003: 21).

1.1.6 Victoria, Australia

The ACIL Tasman (2004) report for the State of Victoria modelled the economic impact of broadband adoption for three scenarios using a general equilibrium model for the period 2004 to 2015. This report fell under Multimedia Victoria, the State of Victoria's ICT sector development initiative including the important Melbourne metropolitan region. The key metrics were the current and future benefits of broadband for productivity, gross state product (GSP) and employment.

The three scenarios used for economic modelling (2004: 36) were:

- A reference case which estimated Victoria's growth without any further broadband productivity gains;
- A conservative case which estimated the impact of broadband on Victoria's growth yet kept the unemployment rate constant; and

- A less conservative case which estimated the impact of broadband on Victoria's growth by asserting a variable unemployment rate.

The results of these scenarios are set out in Table 3 and show that a less conservative case for broadband's economic impact is the preferred scenario for broadband adoption (see 2004: 37).

Table 3: Impact of Broadband in Victoria

Indices	Less conservative case	Conservative case
Real GSP	9.55%	5.29%
Employment	6.09%	0.00%
Investment	10.46%	4.43%
Real wage	2.95%	5.13%
Real consumption	9.20%	5.41%

Note: all data expressed as % difference from the reference case by 2015.

Under the less conservative scenario, and peaking in 2008, the annual contribution of broadband to the GSP of Victoria is AUD2.5 billion with an increase of 18,000 in regional employment (2004: 38 and 40). Other significant projections of broadband adoption were that "the financial, insurance and business service sectors are expected to experience the fastest and greatest productivity gains from broadband use" (2004: vii).The report also noted three qualitative impacts as a result of the greater adoption of broadband that could drive further uptake of the technology: "making the population more knowledgeable", the "convenience of digitally delivered services that substitute for physical or measured services" and "individuals enjoyment of information" (2004: 4).

Research on the impact of broadband for business is available for the Australian context (ACIL Tasman 2004: 13). The Pacific Internet's Broadband Barometer (as published in January 2004) estimated "that broadband penetration among Internet enabled small businesses has increased from 23% in June 2002 to 47% in January 2004." 85% of those businesses which had adopted broadband reported that they saw "an increase in efficiency and productivity. A reduction in costs due to broadband was reported by 47% of broadband users. The report also noted that "21% of narrowband small businesses surveyed [intended] to migrate to broadband within the next six months." Of those businesses with narrowband, the main reasons for not adopting broadband were cost and lack of availability.

3 Cape Town Broadband Survey

As part of ensuring that the benefits that were identified in the literature could be expected in the Cape Town context a limited number of firms were identified and surveyed (A copy of the questionnaire is given in Appendix 2). The intention was to ask factual questions about current communication costs and constraints was well as determine views on potential productivity gains from high speed broadband. The survey covered a wide variety of different types of firms including call centres, media, film, retail, consulting, etc. In addition the survey ranged from multi million rand household name companies to specialist companies with four or five employees. It will be recognised that some firms are more communication and broadband dependent than others so the results of the survey are quite wide.

In order to protect both confidentiality and sector competitive advantage no company names are reported here nor is any particular cost saving or productivity gain associated with any particular sector. What was done internally however was to check the sectoral results against international experiences to ensure that the benefits transfer in Section 4 below correctly reflected both international experiences and Cape Town expectations.

Table 4: Location of surveyed firms

Location of firms by metropolitan area	%
City	55%
Century City	15%
North suburbs	5%
Southern Suburbs	25%

In Table 4 the locations of the surveyed firms are reported. Fifty five percent are located in the city centre, fifteen in Century City, five percent in the northern suburbs and twenty five percent in the southern suburbs. It is clear from this that there was a well balanced distribution of firms in Cape Town.

The types of firms that were surveyed are reported in Table 5. As can be seen these ranged from biotechnology and boat building to retail and tourism.

Table 5: Types of firms

Types of firms by sector	%
Biotechnology	5%
Boat building	5%
Call Centre & BPO	10%
Energy	5%
Engineering	5%
Film	5%
Fishing	5%
ICT	20%
Media	10%
Professional Services Provider	10%
Retail	10%
Tourism	10%

The first part of the survey asked a number of factual questions about telecommunication costs. One of the key questions that was asked in the survey was the cost of land line phones as a percentage of turnover. The results for this question are reported in Table 6. While sixty five percent of firms reported that these costs were less than one percent of turnover, five percent reported them to be over thirty percent and another five percent as more than ten percent.

Table 6: Land line phone cost as a percent of turnover

Firms: Telkom cost as a percent of turnover	%
30%	5%
10%	5%
8%	5%
5%	5%
4%	5%
2%	5%
1%	5%
Less than 1%	65%

Ancillary to the question above was a question on the cost of internet access as a percentage of turnover. The distribution of the answers is reported in Table 7. As can be seen this proved to be less than land line telecommunication cost. Five percent of firms have internet costs that are greater than 10 percent of turnover. Another ten percent have costs greater than five percent of turnover. On the other hand fully half of all firms have internet costs that are less than one percent of turnover.

Table 7: Internet access cost as a percent of turnover

Firms: Internet access cost	%
10%	5%
6%	5%
5%	5%
2%	35%
Less than 1%	50%

The second part of the survey asked question about expected productivity gains as a result of affordable high speed broadband access. Firms were asked to what extent they would expect the productivity of their firm to change. The first of these questions asked about productivity gains as a result of increased download speeds and the results are reported in Table 8. Fully thirty percent of firms expect that productivity would increase by more than ten percent with five firms expecting an increase of forty percent. On the other hand twenty percent of firms did not expect any productivity increase because of faster download speeds.

Table 8: Productivity gains from increased download speeds

Firms: Productivity gains / reduce costs (Download Speeds)	%
40%	5%
25%	5%
20%	5%
15%	5%
10% to 20%	5%
10%	5%
5%	10%
0% / none	15%
Add to productivity	10%
ADSL down speed sufficient	5%
Faster access shortens disaster recovery (backup window)	5%
Faster access enables (near) real-time replication of data	5%
Note: multiple answers provided in some cases	

One of the potential benefits of affordable broadband is the potential for people to work from home, at least for part of the time. This has major societal benefits in that there would be less traffic congestion, less vehicle emissions, provision for parking and noise reduction. While it was not possible to quantify these societal benefits firms were asked if this potential opportunity would make them more productive or reduce costs. The responses to this question are reported in Table 9. Twenty five percent of firms expected at least a five percent productivity increase. Of these five percent expected a thirty percent increase in productivity and another five percent expected a twenty percent increase in productivity. Very few firms expected that there would be no gain as a result of some staff being able to work from home.

Table 9: Productivity gains from being able to work at home

Firms: Productivity gains / reduce costs (Working from Home)	%
30%	5%
20%	5%
15%	5%
10%	5%
5%	5%
2%	5%
None	5%
Saving of R400 per month (reducing parking costs)	5%
Note: multiple answers provided in some cases	

The final question that was asked related to potential productivity gains as a result of improved telecom meetings. Some firms responded numerically to this question while, as can be seen in Table 10, others responded qualitatively. Five percent of firms expect a ten percent increase in productivity from better telecoms meetings and another twenty percent expect a five percent improvement. Most firms expected that there would be savings in local and international calls.

Table 10: Productivity gains from telecom meetings

Firms: Productivity gains / reduce costs (Telecom meetings)	%
10%	5%
5%	20%
1%	5%
0% / none	10%
Limited	5%
Productivity - benefit operations and decision-making	5%
Savings in local calls	5%
Saving in international calls	5%
Huge saving -international VOIP, internal instant messaging	5%
Currently using video conferencing	5%
Would reduce costs	5%
Note: multiple answers provided in some cases	

In summary, the limited survey that was conducted showed that there is almost universal support for affordable high speed broadband access. Most firms expected that there would be cost savings and productivity gains with some expecting large cost savings and productivity gains. What is of note in the results is that the expected cost savings and productivity gains are larger than those experienced else where in the world (as revealed in Section 2).

4 Assessing the economic benefits of the proposed city-wide broadband rollout

This section presents the results to the overall financial and economic cost benefit analysis of the proposed broadband rollout.

4.1 Economic and Financial Cost Benefit Analyses

Both a financial and an economic cost benefit analysis (CBA) have been performed on the proposed broadband rollout. The financial and economic cost benefit analyses differ from conventional cost benefit analyses in that the impact on all the stakeholders within society are considered and not only those of the financing agent. The economic CBA then in turn differs from the financial CBA in that it shows the true cost to society.

4.2 Methodological approach

The Cost Benefit Analysis (CBA) was developed based on best practice and in consultation with the guidelines of the Manual for Cost Benefit Analysis in South Africa (Conningarth, 2007). The CBA makes use of the Net Present Value (NPV) method of discounting all costs and benefits as a means for comparing the various options. The analysis has been conducted from a country wide, i.e. South African, perspective.

In the economic evaluation, transfer payments are netted out, and market prices are adjusted through the use of shadow prices reflecting scarcity and opportunity costs of goods consumed. Financial costs and benefits were converted to economic costs and benefits by allowing for VAT, company taxes, shadow pricing and subsidies. In so doing, the actual cost to society was determined. The shadow prices used in the analysis were sourced from Conningarth, 2007. These are:

Shadow wages were used for unskilled labour (pay-classes were specified). All other pay-classes were used at current salary scales.

- Shadow fuel price for petrol and diesel.
- A shadow electricity price.
- A shadow exchange rate and import duties for those components that would be imported.
- Real discount rate: a real discount rate of 8% was used, as is generally used in analyses of this kind in South Africa.

Direct and indirect taxes and subsidies were incorporated into the CBA model.

It will be appreciated that not all the benefits could be quantified. There are some benefits, such as new business to the city or lost business as a

result of not implementing a broadband network that can be speculated on but not quantified with any degree of certainty. These benefits have been excluded from the analysis but are no less important. It will be shown that the project is still very beneficial to society despite not quantifying some of the benefits.

4.3 The Results of the Cost Benefit Analysis

Cost benefit analysis (CBA) uses three measures to judge whether a project is desirable. These are net present value (NPV), benefit cost ratio (BCR) and internal rate of return (IRR). A NPV shows the overall costs and benefits of a project over all future years in today's values. This is done by discounting future costs and benefits by 8% as specified by the Treasury. A positive NPV shows a project to be desirable. A BCR shows the value of benefits per rand of spending. So a project with a BCR greater than one is desirable and the higher the BCR the better the project. Finally an IRR is the discount rate which gives an NPV of zero. The higher the IRR the better the project. The difference between economic and financial CBAs is that the financial takes account of only monetary values while an economic CBA represents the true benefit (or cost) to society.

The results of the financial and the economic cost benefit analysis are presented in Table 11.

Table 11: Financial and Economic Cost Benefit Analysis Results

Financial NPV (Rm)	R 38,946	Economic NPV (Rm)	R 37,598
Financial BCR	10.3	Economic BCR	10.5
Financial IRR	129.6%	Economic IRR	137.2%

The financial cost benefit has a positive net present value (NPV) of R38.9bn, a benefit cost ratio (BCR) of 10.3 and an internal rate of return (IRR) of 129.6%. All these measures indicate that the broadband rollout project is very beneficial to society.

Similarly, the economic cost benefit analysis indicates an NPV of R37.6bn, a BCR of 10.5 and an IRR of 137.2%. While these values are slightly different to the financial CBA they all still indicate that the project is beneficial to society from an economic point of view. It is interesting to note that while the economic NPV is lower than the financial NPV the economic BCR and IRR are higher than their financial counterparts.

More detail on the costs and benefits of the financial analysis are illustrated in Table 12.

Table 12: Financial Cost and Benefit Detail (Rm 2007 prices)

Costs	NPV
Capital Cost	623
Operating Cost	3,561
Total Costs	4,185
Benefits	
Productivity Gains	41,121
Cost Savings	2,010
Total Benefits	43,131
Net Benefits	38,946

1.1.7 Quantifying the Costs

The costs of the project consist of the capital cost required to set up the broadband network and operating costs. The capital costs in turn consist of the core infrastructure, exchange facilities, connection costs and the equipment required to operate the network. The operating costs consist of corporate expenses (such as rent and telephone usage), exchange point expenses, staff costs, maintenance costs, repayment of loan finance and taxes.

The capital costs have a NPV of R623m while the operating costs have a NPV of R3.56bn. The total costs have a NPV of R4.19bn.

1.1.8 Identifying and Quantifying the Benefits

There is a wide variety of social and economic benefits that would result from the proposed broadband rollout. Some of these can be quantified with a reasonable amount of accuracy, some with less accuracy and some cannot be quantified. The latter includes such benefits as new business to the city, foreign direct investment and the retention of existing business that would possibly relocate elsewhere in the absence of the broadband network. The quantification has been done based on best practice and guided by international case studies. The main benefits that can be quantified are productivity gains and cost savings.

4.3.1.1 Productivity Gains

A faster, more accessible and cheaper broadband network for the city of Cape Town will result in productivity gains to business. In attempting to quantify the productivity gains use was made of the ACIL Tasman study on the productivity gains that a similar network produced for Australia (refer to section 1.1.6). These economic gains per economic sector are summarised in Table 13.

Table 13: Productivity gains per economic sector

Sector	% Incr
Agriculture, forestry and fishing	0.06%
Mining	0.10%
Manufacturing	
Food, beverages and tobacco	0.19%
Textiles, clothing and leather goods	0.19%
Wood and paper; publishing and printing	0.19%
Petroleum products, chemicals, rubber and plastic	0.10%
Other non-metal mineral products	0.19%
Metals, metal products, machinery and equipment	0.19%
Electrical machinery and apparatus	0.19%
Radio, TV, instruments, watches and clocks	0.19%
Transport equipment	0.19%
Furniture and other manufacturing	0.19%
Electricity & water	0.12%
Construction	0.19%
Wholesale & retail trade; catering and accommodation	0.27%
Transport & communication	0.33%
Finance and business services	0.44%
Community, social and other personal services	0.26%
General government services	0.27%

Two factors are immediately apparent. First, these gains are well below those that were given in the Cape Town Survey. Second these productivity gains might seem very low, but when applied to the overall economy of Cape Town and compounded over 20 years the effect can be staggering. This is particularly the case as the productivity gains include the multiplier effect that one sector of the economy would have on other sectors. These gains are illustrated in Figure 1. Given the large differences between the Australian productivity gains and those expected in Cape Town from the businesses that were surveyed it was decided to use the Australian numbers in the analysis rather than those from the Cape Town survey.

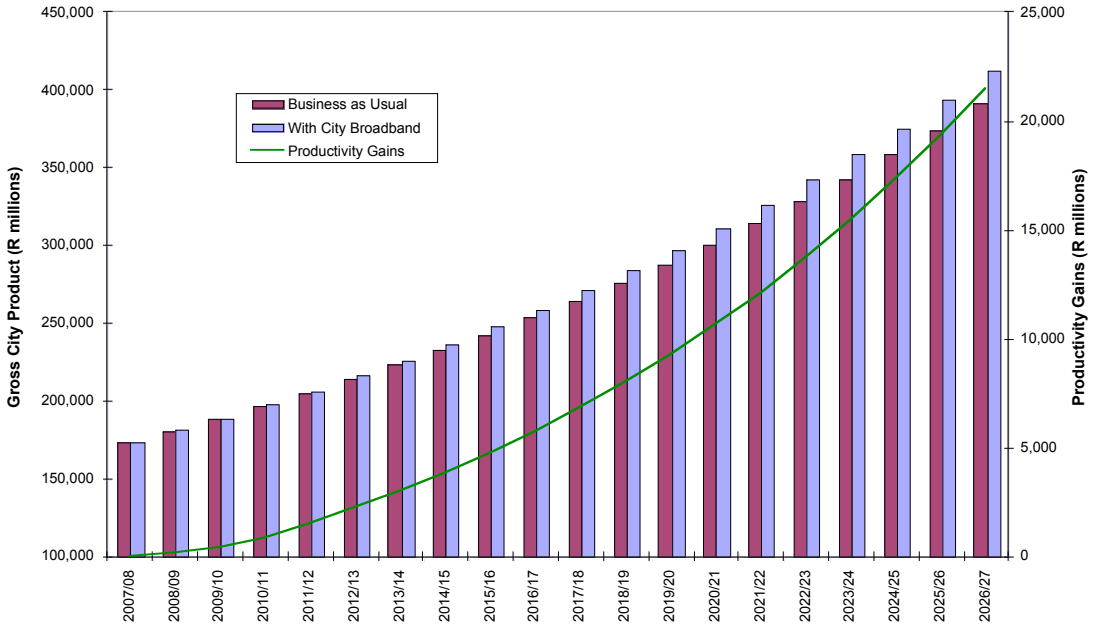
The financial NPV of this increased productivity is R41.1bn, while the economic NPV is R39.6bn.

4.3.1.2 Cost Savings

The cheaper broadband network would result in telecommunications savings for businesses across the economic spectrum in Cape Town. A social accounting matrix (SAM) for South Africa was used to determine the communication costs as a percentage of input costs for all the sectors in Cape Town. The percentage savings from the existence of the network was then estimated in conjunction with field surveys on businesses in Cape Town and applied to the city's economic profile.

The financial NPV of the cost savings is R2.01bn, while the economic NPV is R1.93bn.

Figure 1: Effect of the Broadband Network on Economic Growth in Cape Town



The combined increased productivity and cost savings have a financial NPV of R43.1bn and an economic NPV of R41.5bn.

The detail of the economic costs and benefits for the broadband rollout project are presented in Table 14.

Table 14: Economic costs and benefits of the broadband rollout (Rm 2007 prices)

Costs	NPV
Capital Cost	553
Operating Cost	3,396
Total Costs	3,949
Benefits	
Productivity Gains	39,619
Cost Savings	1,928
Total Benefits	41,547
Net Benefits	37,598

It can be seen from Table 14 that the costs have an economic NPV of R3.95bn and the benefits have an economic NPV of R41.5bn. The overall net benefits (benefits less costs) therefore have an NPV of R37.6bn. All amounts are given in 2007 prices.

5 Macroeconomic benefits

While there are a number of different types of macroeconomic effects, the two most important are contribution to gross domestic product (GDP) and creation of jobs. The importance of job creation is obvious. Increases in GDP are synonymous with increases in peoples' economic standards of living. Increased GDP – i.e. increased production – is experienced in the form of more jobs, higher wages and reduced economic hardship. It is clearly an important measure.

The actual task of calculating the macroeconomic impact of the broadband rollout project demands a detailed and multifaceted approach not least because of the so-called multiplier effects. It is well recognised that the simple act of spending – laying the core infrastructure and building the exchange points, for example, - leads to other economic effects. Demand for steel and cement can lead to increased production in those industries. Increased demand for steel and cement, in turn, leads to increased demand for mining output which uses wood, water, electricity and so on. These are the so-called multiplier effects.

While this process unfolds, each industry employs people and pays wages. Employees, in turn, spend their wages and cause further multiplier effects through the economy. Measuring this is further complicated by the fact that different industries demand different types of skills. This leads to different wage structures across the various industries. People earning different wages have different spending patterns. Thus, the change in overall spending patterns is dependent on which industries are affected.

Therefore the macroeconomic estimates that are made in this report relate directly to the actual cost of developing the infrastructure, as well as the operating cost and productivity gains that business would experience. So included in the macroeconomic calculations are all the backward economic linkages for construction and maintenance and the forward economic linkages where construction workers and others spend their salaries.

5.1 Contribution to Gross Domestic Product

Gross Domestic Product is the total value of all final goods and services produced in the country. It is clearly fundamental to the economic quality of life of people in the country. It is also the most important and all encompassing measure of the macroeconomic effect of the restructured public transport scheme. Table 15 reports on the contribution to GDP and the composition of this change.

Table 15: Contribution to Gross Domestic Product

Contribution to Gross Domestic Product - South Africa Rand million, 2007 prices	2007/08	2008/09	2009/10	2010/11	2011/12	2016/17	2021/22	2026/27
Capital Expenditure	207	266	127	200	149			
Operational Expenditure	18	47	76	257	612	533	519	515
Productivity Gains	0	170	533	1,116	1,947	7,373	15,565	27,686
Total Contribution	225	483	736	1,572	2,708	7,906	16,084	28,201
Cumulative Contribution	225	708	1,444	3,016	5,724	33,643	96,388	211,304

Capital expenditure could be expected to contribute between R127m and R266m to national GDP between 2007/08 and 2011/12 when the infrastructure is developed.

The contribution from operations is expected to show a steady increase from R18m in 2007/08 to R515m in 2026/27. All prices are given in 2007 prices and any increase in numbers is due to real growth.

The major contribution to GDP though is the increase in productivity gains. This contribution is expected to increase from R170m in 2008/09 to R27.7bn in 2026/27.

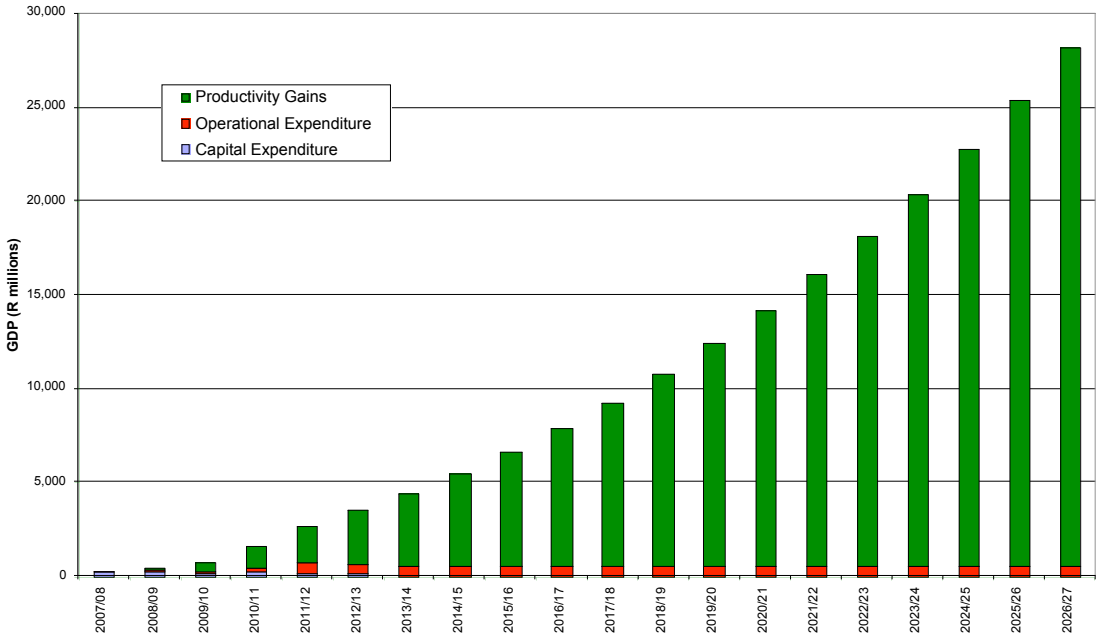
It will be noticed that one of the highlighted benefits of affordable broadband, viz. cost savings have not been included as part of the macroeconomic benefits. The reason for this is that macroeconomic benefits are dependent on spending. Hence if there are cost savings it is likely that these cost savings are going to be spent in one form or another on something else. Hence from a macroeconomic perspective this is a zero sum game although from a business perspective these cost savings are highly desirable.

The total contribution to GDP is expected to amount to R225m in 2007/08, R483m in 2008/09 and R736m in 2009/10. Total contribution to GDP is then expected to increase to R28.2bn in 2026/27.

GDP is important not just because it is income but also because income has the capacity to add to wealth. Based on these projections, the proposed broadband rollout would have made a cumulative contribution to GDP of R5.7 billion by 2011/12 when the majority of the infrastructure development will be complete. This cumulative total increases to over R211bn by 2026/27.

The contribution to South African Gross Domestic Product is shown in more detail in Figure 2.

Figure 2: Contribution to South African Gross Domestic Product



The relative contributions to GDP of the capital and operational expenditure and productivity gains are shown in the figure.

5.2 Contribution to Western Cape Gross Geographic Product

Gross Geographic Product (GGP) is the provincial equivalent of national GDP. Naturally while many of the direct effects will be felt within the province there will be indirect effects on other provinces. The project contribution to provincial GGP is reported in Table 16 below.

Table 16: Contribution to Western Cape Gross Geographic Product

Contribution to Gross Geographic Product - Western Cape Rand million, 2007 prices	2007/08	2008/09	2009/10	2010/11	2011/12	2016/17	2021/22	2026/27
Capital Expenditure	38	49	23	37	28			
Operational Expenditure	3	8	13	45	108	91	89	88
Productivity Gains	0	137	431	901	1,573	5,951	12,554	22,316
Total Contribution	41	195	467	983	1,709	6,042	12,643	22,405
Cumulative Contribution	41	236	703	1,687	3,395	24,140	73,098	164,107

After taking account of all multiplier effects it is estimated that the proposed project would make a total contribution to Western Cape GGP of R38m in 2007/08 and R195m in 2008/09. By 2026/27 the project would add R22.4bn to GGP. Based on these projections, the proposed project would have added a cumulative R164.1 billion to provincial GGP by 2026/27.

5.3 Contribution to Cape Town Gross Geographic Product

The project contribution to Cape Town GGP is reported in Table 17 below.

Table 17: Contribution to Cape Town Gross Geographic Product

Contribution to Gross City Product - Cape Town Rand million, 2007 prices	2007/08	2008/09	2009/10	2010/11	2011/12	2016/17	2021/22	2026/27
Capital Expenditure	29	37	18	28	21			
Operational Expenditure	2	6	10	34	80	68	66	66
Productivity Gains	0	132	415	868	1,515	5,730	12,087	21,480
Total Contribution	31	175	442	930	1,616	5,798	12,153	21,545
Cumulative Contribution	31	206	649	1,578	3,194	23,066	70,106	157,613

After taking account of all multiplier effects it is estimated that the proposed project would make a total contribution to Cape Town GGP of R31m in 2007/08 and R175m in 2008/09. By 2026/27 the project would add R21.5bn to GGP. Based on these projections, the proposed project would have added a cumulative R157.6 billion to Cape Town GGP by 2026/27.

5.4 Direct and indirect job creation

The proposed broadband rollout in Cape Town would result in changes to three types of jobs. The first are the direct jobs that would be created over the project period. These are jobs directly on infrastructure development, the construction of exchange facilities and operations. The second are the so-called indirect jobs that are due to multiplier effects of both the capital and operational costs of the public transport as well as from changes in transport usage and time savings. The third type of change in jobs results from the structural economic changes attributable to the proposed project as a result of cost savings and, particularly, productivity gains that would make Cape Town businesses more competitive.

Table 18 reports on the direct job creation, Table 19 on the indirect jobs that are created as a result of the project, while Table 20 is a sum of the direct and indirect job creation.

Table 18: Contribution to Direct Jobs in Cape Town

Contribution to Direct Jobs - Cape Town	2007/08	2008/09	2009/10	2010/11	2011/12	2016/17	2021/22	2026/27
Capital Expenditure	455	560	273	419	294			
Operational Expenditure	25	68	116	328	696	850	829	824
Productivity Gains	0	277	865	1,801	3,127	11,562	23,867	41,570
Total Contribution	479	905	1,254	2,548	4,116	12,412	24,696	42,394

Table 18 indicates that during the construction period anywhere between 273 and 560 people could be employed on a full time basis on the project. The number of people directly employed from operations is estimated to increase from 25 in 2007/08 to 824 in 2026/27. Additional jobs would be created from productivity gains, increasing from 277 in 2008/09 to over 41 500 in 2026/27.

The estimation of indirect jobs is a debatable issue. The estimates are based on the official South African input output tables which show quite generous estimates for indirect jobs. In the light of the historic 'jobless' economic growth that this country has had we have tended to downplay indirect job estimates. However given the fact that we have, in the last two years, seen a resurgence in actual job creation gives us hope that the indirect job multipliers may now be closer to reality. Therefore the indirect job estimates that are reported below are based on the full multiplier estimates but should be treated as the upper bound of these estimates.

Table 19: Contribution to Indirect Jobs

Contribution to Indirect Jobs - South Africa	2007/08	2008/09	2009/10	2010/11	2011/12	2016/17	2021/22	2026/27
Capital Expenditure	1,793	2,273	1,081	1,693	1,245			
Operational Expenditure	139	379	629	2,204	5,309	4,559	4,439	4,413
Productivity Gains	0	1,279	4,010	8,384	14,614	55,075	115,778	205,170
Total Contribution	1,932	3,932	5,720	12,280	21,168	59,634	120,216	209,583

Table 19 illustrates the potential indirect job creation. Capital Expenditure would be responsible for creating 1 793 indirect jobs in 2007/08 and 2 273 indirect jobs in 2008/09. This number is then expected to decrease to 1 245 in 2011/12.

The number of indirect jobs due to operational expenditure is expected to increase from 139 in 2007/08 to 4 413 in 2026/27. Productivity gains should see indirect jobs increase from 1 279 in 2008/09 to 205 170 in 2026/27.

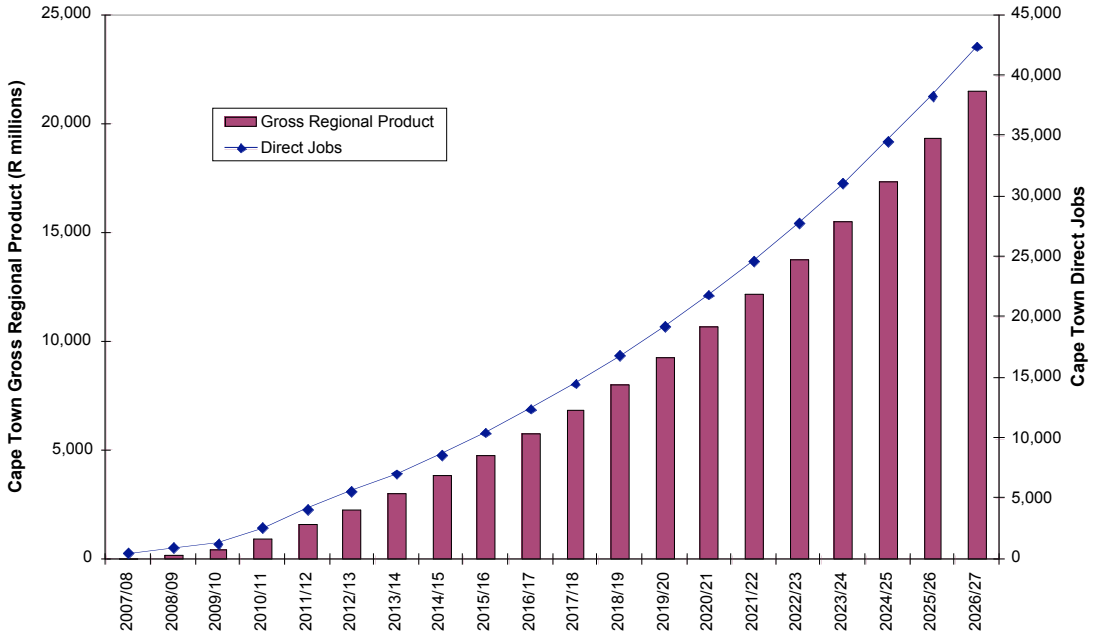
Table 20: Contribution to Total Jobs

Contribution to Total Jobs - South Africa	2007/08	2008/09	2009/10	2010/11	2011/12	2016/17	2021/22	2026/27
Capital Expenditure	2,248	2,834	1,354	2,112	1,539			
Operational Expenditure	164	447	745	2,532	6,004	5,409	5,268	5,236
Productivity Gains	0	1,556	4,875	10,184	17,741	66,637	139,644	246,740
Total Contribution	2,412	4,837	6,974	14,828	25,285	72,046	144,912	251,977

Total direct and indirect jobs, as illustrated in Table 20, are expected to amount to 2 412 in 2007/08 and 4 837 in 2008/09. It is expected that 14 828 direct and indirect jobs would be created in 2010 and nearly 252 000 by 2027.

The contribution to Western Cape GGP and direct jobs in the province is illustrated in Figure 3.

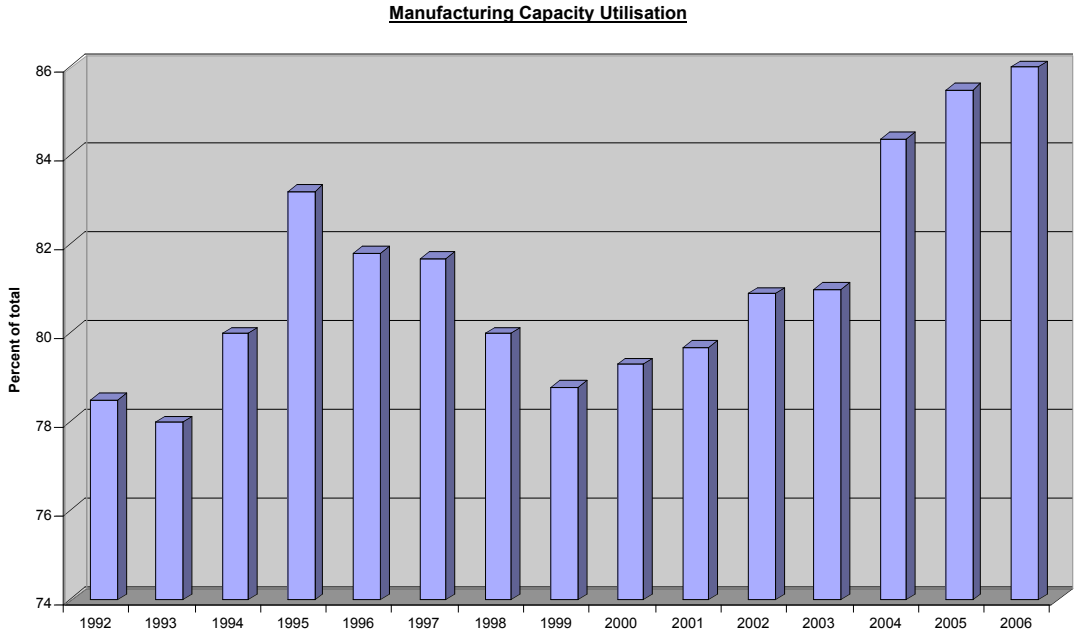
Figure 3: Contribution to Cape Town GGP and Direct Jobs



5.5 Gross Fixed Capital Formation

Capital formation refers to the value of plant that is needed to support the value of output. The degree to which a project can bring about additional capital formation is a function of the actual size of the project, the existence of limited capacity in the manufacturing sector and the degree of confidence in the future. Figure 4 shows the percentage of capacity utilisation in manufacturing. It is clear that capacity utilisation is the highest that it has been since the early 1990s. Furthermore a capacity utilisation of 85% is generally considered to be full capacity because the remaining capacity is typically taken with downtime and maintenance schedules. What the figure therefore demonstrates is that manufacturing is largely at full capacity and that any increase in demand would lead to increased capital formation.

Figure 4: Percentage capacity utilisation in Manufacturing



Source: SA Reserve Bank. Note that there is a data break after 2003 because of a new survey based on Statistics SA new business register

The increased productivity that businesses would experience because of the broadband rollout would have an effect on gross fixed capital formation. It is estimated that this gross fixed capital formation would increase from R534m in 2007/08 to over R90bn in 2026/27, as indicated in Table 21.

Table 21: Gross Fixed Capital Formation

Contribution to Gross Fixed Capital Formation - South Africa Rand million, 2007 prices	2007/08	2008/09	2009/10	2010/11	2011/12	2016/17	2021/22	2026/27
Capital Expenditure	481	644	306	493	383			
Operational Expenditure	53	137	216	764	1,890	1,444	1,405	1,393
Productivity Gains	0	535	1,680	3,521	6,154	23,468	49,866	89,223
Total Contribution	534	1,315	2,202	4,779	8,428	24,912	51,271	90,616

5.6 Other macroeconomic effects

Apart from the key macroeconomic effects discussed above, there are many other macroeconomic effects that would flow from the restructured public transport project. These include the generation of income tax, company tax and indirect household income. Table 22 reports on total income tax that would be generated and Table 23 on the indirect generation of household income.

Table 22: Contribution to Taxes

Contribution to Taxes - South Africa Rand million, 2007 prices	2007/08	2008/09	2009/10	2010/11	2011/12	2016/17	2021/22	2026/27
Capital Expenditure	22	29	14	22	16			
Operational Expenditure	2	5	8	28	71	53	51	51
Productivity Gains	0	18	55	116	202	766	1,620	2,886
Total Contribution	24	51	77	166	289	819	1,672	2,937
Cumulative Contribution	24	75	152	318	607	3,495	10,010	21,971

Total tax generation is expected to increase from R24m in 2007/08 to R2.9bn in 2026/27. When the majority of the capital expenditure will be complete in 2011/12 a cumulative total of R607m in taxes would have been generated by the project. The cumulative contribution to taxes by 2026/27 is expected to exceed R21.9bn.

Table 23: Contribution to Indirect Household Income

Contribution to Indirect Household Income - South Africa Rand million, 2007 prices	2007/08	2008/09	2009/10	2010/11	2011/12	2016/17	2021/22	2026/27
Capital Expenditure	109	139	66	104	77			
Operational Expenditure	9	23	38	140	345	271	263	262
Productivity Gains	0	85	268	561	979	3,705	7,815	13,891
Total Contribution	118	248	372	805	1,401	3,975	8,078	14,153
Cumulative Contribution	118	366	739	1,543	2,944	16,992	48,517	106,204

The project will also contribute to indirect household income. By 2026/27 it is expected that the project will have cumulatively added over R106bn to indirect household income.

6 Conclusion

This study set out to determine the likely economic impact on the City of Cape Town of the proposed roll out of the dark fibre project. The study was guided by international best practise and by a survey of business expectations in Cape Town of the likely impact of high speed and affordable broadband.

The social overhead capital of expenditure on telecommunications as a public infrastructure, described by Waverman *et al* in their report, "The Impact of Telecoms on Economic Growth in Developing Countries" (2005), is the prime reason why municipalities invest in dark fibre infrastructure. The open access network model then provides an enabling environment for a market-driven utilisation of this broadband infrastructure.

This report has briefly outlined international best practices of the open access model and its concomitant and demonstrated economic benefits to a local economy – be it in Florida, Canada or Australia. These lessons light a wider path for the decision-makers to walk as the City of Cape Town embarks on providing economic opportunities to its citizens and businesses by means of increased access to broadband.

These lessons from the international literature also offer the prospect of increasing business confidence in the local economy and, as Manuel Castells so aptly noted, "even new waves of technological innovation (in biotechnology, in the mobile Internet, in nanotechnology) cannot reactivate the economy unless there is trust in their future business prospects." The development of a stable broadband infrastructure offers this confidence in growth and innovation.

If we share Castells' view of matching developmental agendas with market-driven incentives then we see that "the new economy, spearheaded by e-business, is not an on-line economy, but an economy powered by information technology, dependent on self-programmable labour, and organized around computer networks. These seem to be the sources of labour productivity growth, and thus wealth creation, in the Information Age" (2005: 99 and 111).

The City of Cape Town's investment in dark fibre infrastructure meets Castells' requirements for local economic development by means of the knowledge economy. It also draws on the important international trend of deploying a municipal open access model to stimulate economic activity within a city – shifting the primary mode of production from manufacturing to services based on, what Mark Poster has termed, the "mode of information," where "electronic systems of communications are changing the fabric of advanced [that is, post-industrial] societies" as well as transitional and developing economies (1989: 125).

If anything, this report has shown that the argument for *broadband as a new utility* cannot be ignored in shaping infrastructure provision for

stimulating economic activities within a municipal area such as the City of Cape Town.

Expectations in Cape Town

As part of ensuring that the benefits that were identified in the literature could be expected in the Cape Town context a limited number of firms were identified and surveyed. The intention was to ask factual questions about current communication costs and constraints was well as determine views on potential productivity gains from high speed broadband.

The first part of the survey asked a number of factual questions about telecommunication costs. One of the key questions that was asked was the cost of land line phones as a percentage of turnover. While sixty five percent of firms reported that these costs were less than one percent of turnover, five percent reported them to be over thirty percent and another five percent as more than ten percent.

A question was asked about the cost of internet access. This proved to be less than land line telecommunication cost. Five percent of firms have internet costs that are greater 10 percent of turnover. Another ten percent have costs greater than five percent of turnover. On the other hand fully half of all firms have internet costs that are less than one percent of turnover.

The second part of the survey asked questions about expected productivity gains as a result of affordable high speed broadband access. Firms were asked to what extent they would expect the productivity of their firm to change. The first of these questions asked about productivity gains as a result of increased download speeds. Fully thirty percent of firms expect that productivity would increase by more than ten percent with five firms expecting an increase of forty percent. On the other hand twenty percent of firms did not expect any productivity increase because of faster download speeds.

One of the benefits of affordable broadband is the potential for people to work from home, at least for part of the time. This has major societal benefits in that there would be less traffic congestion, less vehicle emissions, provision for parking and noise reduction. While it was not possible to quantify these benefits, firms were asked if this potential opportunity would make them more productive or reduce costs. Twenty five percent of firms expected at least a five percent productivity increase. Of these five percent expected a thirty percent increase in productivity and another five percent expected a twenty percent increase in productivity. Very few firms expected that there would be no gain as a result of some staff being able to work from home.

Cost Benefit Analysis

Both a financial and an economic cost benefit analysis (CBA) were performed on the proposed broadband rollout. The financial and economic cost benefit analyses differ from conventional cost benefit analyses in that the impact on all the stakeholders within society are

considered and not only those of the financing agent. The economic CBA then in turn differs from the financial CBA in that it shows the true cost to society.

Cost benefit analysis (CBA) uses three measures to judge whether a project is desirable. These are net present value (NPV), benefit cost ratio (BCR) and internal rate of return (IRR). A NPV shows the overall costs and benefits of a project over all future years in today's values. This is done by discounting future costs and benefits by 8% as specified by the Treasury. A positive NPV shows a project to be desirable. A BCR shows the value of benefits per rand of spending. So a project with a BCR greater than one is desirable and the higher the BCR the better the project. Finally an IRR is the discount rate which gives an NPV of zero. The higher the IRR the better the project. The difference between economic and financial CBAs is that the financial takes account of only monetary values while an economic CBA represents the true benefit (or cost) to society.

The financial cost benefit has a positive net present value (NPV) of R38.9bn, a benefit cost ratio (BCR) of 10.3 and an internal rate of return (IRR) of 129.6%. All these measures indicate that the broadband rollout project is very beneficial to society.

Similarly, the economic cost benefit analysis indicates an NPV of R37.6bn, a BCR of 10.5 and an IRR of 137.2%. While these values are slightly different to the financial CBA they all still indicate that the project is beneficial to society from an economic point of view. It is interesting to note that while the economic NPV is lower than the financial NPV the economic BCR and IRR are higher than their financial counterparts.

Macroeconomic Analysis

While there are a number of different types of macroeconomic effects, the two most important are contribution to gross domestic product (GDP) and creation of jobs. The importance of job creation is obvious. Increases in GDP are synonymous with increases in peoples' economic standards of living. Increased GDP – i.e. increased production – is experienced in the form of more jobs, higher wages and reduced economic hardship. It is clearly an important measure.

- Capital expenditure could be expected to contribute between R127m and R266m to national GDP between 2007/08 and 2011/12 when the infrastructure is developed.

- The contribution from operations is expected to show a steady increase from R18m in 2007/08 to R515m 2026/27. All prices are given in 2007 prices and any increase in numbers is due to real growth.

- The major contribution to GDP though is the increase in productivity gains. This contribution is expected to increase from R170m in 2008/09 to R27.7bn in 2026/27.

- The total contribution to GDP is expected to amount to R225m in 2007/08, R483m in 2008/09 and R736m in 2009/10. Total contribution to GDP is then expected to increase to R28.2bn in 2026/27.

- GDP is important not just because it is income but also because income has the capacity to add to wealth. Based on these projections, the proposed broadband rollout would have made a cumulative contribution to GDP of R5.7 billion by 2011/12 when the majority of the infrastructure development will be complete. This cumulative total increases to over R211bn by 2026/27.

The proposed broadband rollout in Cape Town would result in changes to three types of jobs. The first are the direct jobs that would be created over the project period. These are jobs directly on infrastructure development, the construction of exchange facilities and operations. The second are the so-called indirect jobs that are due to multiplier effects of both the capital and operational costs of the public transport as well as from changes in transport usage and time savings. The third type of change in jobs results from the structural economic changes attributable to the proposed project as a result of cost savings and, particularly, productivity gains that would make Cape Town businesses more competitive.

- During the construction period anywhere between 273 and 560 people could be employed on a full time basis on the project. The number of people directly employed from operations is estimated to increase from 25 in 2007/08 to 824 in 2026/27. Additional jobs would be created from productivity gains, increasing from 277 in 2008/09 to over 41 500 in 2026/27.

- The estimation of indirect jobs is based on the official South African input output tablesand should be treated as the upper bound of these estimates. Capital Expenditure would be responsible for creating 1 793 indirect jobs in 2007/08 and 2 273 indirect jobs in 2008/09. This number is then expected to decrease to 1 245 in 2011/12. The number of indirect jobs due to operational expenditure is expected to increase from 139 in 2007/08 to 4 413 in 2026/27. Productivity gains should see indirect jobs increase from 1 279 in 2008/09 to 205 170 in 2026/27.

- Total direct and indirect jobs are expected to amount to 2 412 in 2007/08 and 4 837 in 2008/09. It is expected that 14 828 direct and indirect jobs would be created in 2010 and nearly 252 000 by 2027.

Other macroeconomic benefits include:

- Capital formation is the value of plant that is needed to support the value of output. The degree to which a project can bring about additional capital formation is a function of the actual size of the project, the existence of limited capacity in the manufacturing

sector and the degree of confidence in the future. The increased productivity that businesses would experience because of the broadband rollout would have an effect on gross fixed capital formation. It is estimated that this gross fixed capital formation would increase from R534m in 2007/08 to over R90bn in 2026/27.

- Total tax generation is expected to increase from R24m in 2007/08 to R2.9bn in 2026/27. When the majority of the capital expenditure will be complete in 2011/12 a cumulative total of R607m in taxes would have been generated by the project. The cumulative contribution to taxes by 2026/27 is expected to exceed R21.9bn.

- The project will also contribute to indirect household income. By 2026/27 it is expected that the project will have cumulatively added over R106bn to indirect household income.

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8 Appendix 1: The Broadband Manifesto

Broadband Manifesto

EUROCITIES is the mayor network of European cities. The network brings together more than 120 large cities in some 32 European countries. The EUROCITIES Broadband Manifest is developed within the Knowledge Society Forum - TeleCities and actively contributes to implementation of the i2010 agenda, ensuring the deployment of broadband and ICT in cities.

EUROCITIES embraces high speed secure networks as an engine for jobs & growth contributing to economic, social and urban development. Members share know-how on proven models of broadband deployment and stimulate the development of broadband services. Based on practical experience and a coherent vision, the cities participating in EUROCITIES with this manifesto present ten building blocks for a broadband policy.

1 No knowledge society without broadband and broadband services

EUROCITIES underlines the importance to cities of high speed and secure networks. Broadband networks make cities more attractive as places to live, play and work. Broadband is not only a precondition for the deployment of ICTs, it also boosts the development of the urban knowledge economy, connecting all citizens in the community to a high quality infrastructure and thus preventing a 'digital divide'.

2 No broadband services without fibre optics

Fibre optics is the only future-proof infrastructure. Investing in other permanent infrastructure will only yield short term results, will be less effective and may slow down innovation. EUROCITIES regards wireless broadband infrastructures as a useful addition, especially for mobile applications or applications in the public areas.

3 Independent fibre optic networks

Maximum access to fibre optic networks leads to social gains. Such networks should operate completely independently from the services offered in order to ensure open access for all. EUROCITIES supports the multi-layered model, which has been used in the liberalisation of the energy market. Broadband infrastructures should be open, affordable and widely accessible.

4 A fibre optics monopoly? Naturally!

The "passive" fibre optic infrastructure is a natural monopoly. It is a network infrastructure comparable to roads, sewers, and energy and therefore requires large one-off investment. Competition on this asset does not make economic sense, yet efficient network infrastructures are essential for society to function.

5 A market system, subject to...

The benefits of free market will not be provided by monopolies. Regulation can be used to correct earlier arrangements. EUROCITIES believes that an open and accessible "passive" layer of infrastructure would guarantee competition in the service layer. Finance, particularly for the "backbone" network, through local, national and European public funds, should be allowed in the same way as for (national) roads and highways or other basic infrastructures.

6 Make room for local initiatives

An open infrastructure creates a market whereby local entrepreneurs can offer their services and stimulate the local economy. The services themselves will lead to improvements in community and social life. The success of local bundling of demand underlines the need for such an infrastructure. Businesses and public sector should cooperate in local "smart" partnerships and funding programmes need to cater for such initiatives.

7 Connect the dots now

Trans-national interconnected Open Broadband networks, based upon standard technology and regulatory frameworks, provide the critical mass needed to deploy services throughout the European Union. It is expected that by 2008 a large number of households will need the symmetrical connections that only fibre optics can provide. It takes five to eight years to complete large infrastructural projects. Time is therefore of the essence!

8 Platform for public services

In order to avoid 'reinventing the wheel' we recommend the development of EU-wide standardised interoperable platforms for public sector services (such as eHealth, eLearning, eSecurity and eGovernment).

9 The voice of cities: Consulting Partner

The i2010 initiative recognises the role of cities in the development of high speed networks and rich multimedia content. EUROCITIES brings together experts from innovative cities and as such is a natural consulting partner for the Commission when preparing further action with regard to the deployment of broadband such as the 7th Research Framework Programme, the review of regulatory frameworks and the Competitiveness and Innovation Programme.

10 Collaboration: call for support

The European Commission and national governments are giving too much leeway to the market without demanding sufficient guarantees as to the quality of the development. Taylor-made arrangements are needed (financial, regulatory, etc.). Moreover, the desired development of broadband and broadband services calls for collaboration between all parties: cities, regions, national government, market parties, interest groups and other relevant organisations.

EUROCITIES www.eurocities.org

9 Appendix 2: Survey Questionnaire

21 July 2007

Making an Assessment of Affordable Fibre Optic Broadband on Cape Town

Dear Sir/Madam

The City of Cape Town is currently investigating the possibility of installing a dedicated fibre optic broadband network across the city. This network, which would be owned by the City, would be made available to all businesses and people in Cape Town.

The network would be faster than anything that is currently available and would cost considerably less. The costs would be a fraction of current Telkom charges.

The City of Cape Town needs to understand the broader economic implications of such a network before final decisions can be taken. For this purpose the City has appointed Strategic Economic Solutions, a consulting company, working in tandem with the Graduate School of Business at UCT to investigate the likely economic impact of such a network.

In order for us to undertake this work we need to ask selected business a limited number of questions about the likely impact of the proposed broadband network.

I am hoping therefore that you are able to take a few minutes from you busy schedule to help us and answer the few questions that are attached to this letter. All responses will be treated in the strictest confidence.

The survey is being administered by Mr Glen Thompson (082 412 6834 glen@smsresearch.co.za) but please feel free to contact me should you wish to discuss further.

Thanking you in advance for your help.

Yours sincerely

Barry Standish

The Impact of Affordable Full Broadband on Your Business

General:

Company name	
Contact person	
Phone number	
Email address	
Mailing address	

Company demographics:

Type of company (e.g. film industry, call centre)	
Annual turnover	
Number of Employees	
Years in business	
Type of internet connectivity (e.g. ADSL)	
Internet service provider	

Telecommunication costs:

Telkom cost as a percent of total cost	
Internet access cost as a percent of total cost	
Broadband usage (GB per month)	
Broadband requirements	
Reasons for difference between usage and requirements (if any)	

Potential competitive/productivity gains:

We are interest in your opinion about where and by how much a faster broadband network would help you be more competitive/productive. We have listed a number of potential areas but have left room for you to add to the list. Are you able to indicate by approximately how much each item could add to productivity and/or reduce costs?

Competitive/productivity gain	How much will this improve total company productivity and/or reduce costs?
Download speeds	
Download options (e.g. videos, interactive manuals)	
Working from home (e.g. traffic congestion, travel time and cost)	
Telecom meetings	

Open ended comments:

Please feel free to express any other thoughts that you have about the impact of inexpensive full broadband on your business.
