Assessment of Funding Options for Infrastructure Delivery at a Local Government Level: A KwaZulu-Natal Case Study

Key Words*:* Development Finance, Funding Mechanisms, Public Infrastructure, Infrastructure Delivery, Local Government.

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ABSTRACT

Efficient public infrastructure plays a key role in a competitive and productive economy and therefore the ongoing funding and financing of infrastructure delivery is of critical importance. The central issue or the argument at hand is that infrastructure needs have grown beyond the capacity of governments and especially local government.

The capacity of local government to meet expectations for improved infrastructure delivery have diminished and are under real pressure, and the use of financing options involving the private sector for example can reduce the call on public resources, allowing scarce public funds to be targeted in a more effective manner.

While alternative financing and funding models offer opportunities to reduce the immediate call on governments, it should be noted that the application of new models is not a panacea. Ultimately infrastructure can only be funded through taxation, borrowings or direct user charges.

This paper presents a possible viable alternative funding model for the provision of public infrastructure. A municipal abetment programme is proposed that will incentivise the private sector to supply the public infrastructure as part of the overall development.

1. INTRODUCTION

Bailey (2011) states that public infrastructure delivery can be funded from one or both of public finance or private finance. Traditionally, the majority of public finance has come from government borrowing. Revenues from taxes are then used to repay the ensuing debt over the expected lifetime of these physical assets provided by the public sector itself. This traditional infrastructure funding model secures inter-generational equity by smoothing out the one off costs of infrastructure investments so that future users of infrastructure pay for it rather than placing the whole financial burden on the current generation of taxpayers.

In spite of recent increases in public infrastructure investments in South Africa (SA), municipal infrastructure is decaying faster than it is being renewed (DBSA, 2012 and Boshoff, 2009). Peters (2013) states that years of neglect in caring for infrastructure networks have placed many local municipalities on the precipice of a breakdown. Factors such as low funding, poor planning, population growth, urbanization, tighter health, safety and environmental standards, poor quality control leading to inferior installation, inadequate inspection and maintenance, and lack of consistency and uniformity in design, construction and operation practices have impacted on municipal infrastructure. At the same time, an increased burden on infrastructure due to significant growth in some sectors (especially property and informal settlements) tends to quicken the ageing process while increasing the social and monetary cost of service disruptions due to maintenance, repairs or replacement.

Infrastructure shortfalls can have serious implications for communities and businesses in terms of the protection and continued utility of capital assets (Federation of Canadian Municipalities, 2002, Business Council Australia, 2013). The potential implications are broader than economic issues, however, when consideration is given to the role infrastructure plays in providing essential services, supporting economic development, protecting health and safety, and contributing to quality of life in the community. Some infrastructure, such as wastewater treatment plants and storm water management practices, also protect the environment from the full effects of human activities. Municipal infrastructure decision makers must consider economic, social and environmental factors for priority setting and funding allocation.

The current trends in local government infrastructure funding in South Africa clearly indicate that historic and traditional mechanisms of funding infrastructure delivery are inadequate to meet most needs (see for instance Josie, 2008 and Franks, 2012). It is especially social infrastructure in growth corridors that are lacking. Alternative funding mechanisms can provide part of the answer to infrastructure needs. But it must be made very clear that alternative funding mechanisms are not a panacea. Other solutions or options are identified through practices in areas such as long-term planning, establishing levels of service, benchmarking for performance optimisation, life cycle asset management, service demand management, public education and participation in decision making and solution implementation. These practices are in most cases just as important and relevant as alternative funding mechanisms in addressing the infrastructure challenges (Boshoff, 2009).

Alternative funding mechanisms are a best practice because they can assist in fulfilling unmet needs (see Federation of Canadian Municipalities, 2011, DeLoitte, 2013). The following list outlines the additional benefits of specific practices. Some alternative funding mechanisms can better allocate costs to those benefiting from the service thus increasing equity in provision of services. Some can increase accountability by clear allocation of funds, while others can increase flexibility or service levels through contractual arrangements or partnerships. There are several potential benefits associated with alternative funding mechanisms:

- revenue to support continued provision of safe and efficient infrastructure;
- supplementing the property tax base;
- incorporating life cycle costs of infrastructure (i.e., depreciation of infrastructure; operation and maintenance costs resulting from new capital investments);
- reliable, predictable, dedicated funding to support multi-year infrastructure investment strategies;
- providing additional options to generate infrastructure funds; and
- demand management techniques being developed.

This paper will focus on developing a framework for plugging the municipal infrastructure funding gap. The paper, amongst other things, investigates the theoretical funding mechanism for municipal infrastructure financing. The paper also attempts to conduct cost benefit analysis of some of the proposed funding mechanisms employing a case study methodology.

2. THE PROVISION OF LOCAL GOVERNMENT INFRASTRUCTURE

2.1 What is public infrastructure?

Industry Super Australia (2013) states that 'public infrastructure' consists of physical assets and related services. Physical public infrastructure assets include both economic infrastructure (such as roads, rail, ports, and communication) and social infrastructure (such as correctional, health, educational, accommodation, public housing and court facilities). Public infrastructure, whether economic or social infrastructure, exhibit shared characteristics: they both deliver essential services, have long economic lives, high capital costs, high barriers to entry, high levels of uncertainty and illiquidity and often involve governments as regulatory or funding counter-parties.

2.2 Definition of funding and financing mechanisms

Calitz and Fourie (2007) contextualized the distinction between funding and financing of public infrastructure. The term funding refers to how infrastructure is paid for. Ultimately there are only two sources of funding for infrastructure – government revenue raising (the tax payer) or direct user charges. This is opposed to financing, which refers to the way debt and/or equity is raised for the delivery and operation of an infrastructure project.

The Committee for Melbourne (date unknown) states that the distinction between finance and funding needs to be clear: a funding source must be present to support

finance. The Committee argues that this is a critical point because the availability of capital or financial products does not obviate the funding requirement. There is no magic pudding. While there are specific issues – and opportunities – with funding and finance, they are not the same.

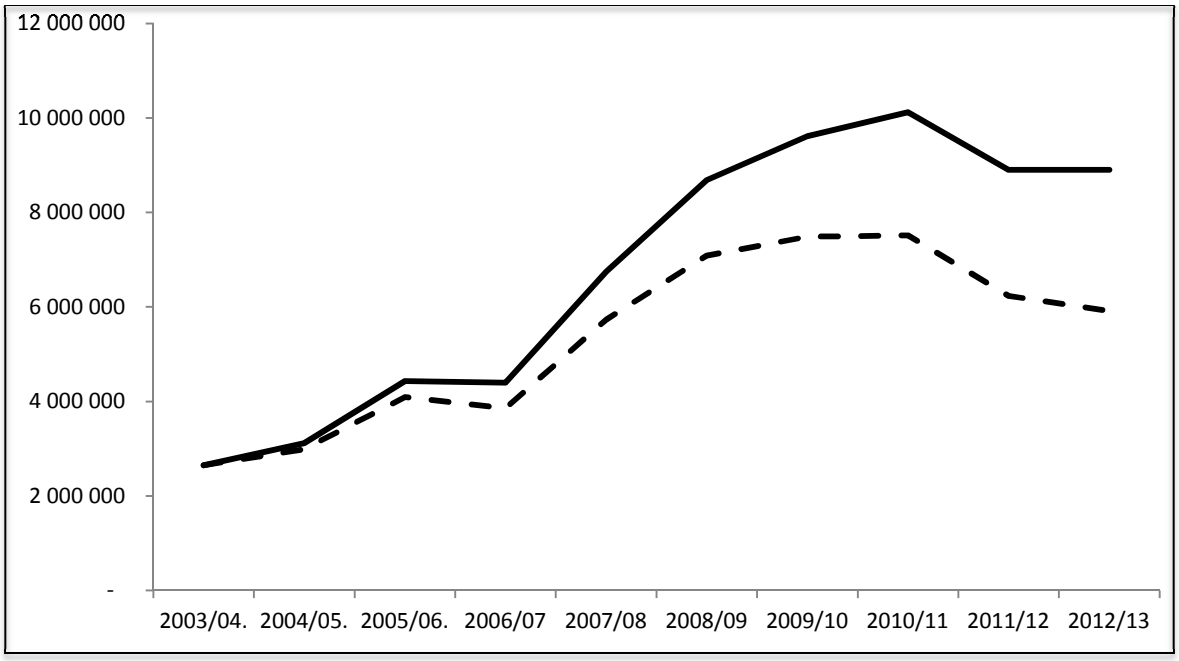
Funding, according to the Committee for Melbourne, for infrastructure is ultimately sourced from the community. Funding can be sourced directly from users of infrastructure or indirectly through taxes and charges (or rates for local government).

2.3 Trends in local government infrastructure delivery

The below graph and two tables displays a number of key characteristics of local government infrastructure expenditure in the province of KwaZulu-Natal (KZN) from the 2003/04 to 2012/13 financial year. Graph 1 displays total local government infrastructure expenditure over the period in both nominal (solid line) and real (dash line) terms. Table 1 displays the sources of funding for the infrastructure delivery whilst table 2 displays the classification of infrastructure delivery.

From graph 1 it seems that there has been a strong and consistent growth (both in nominal and real terms) in infrastructure delivery from the 2003/04 to 2009/10 financial years. However, the trend was not sustained with infrastructure delivery decreasing during the 2010/11 to 2012/13 financial years. Total infrastructure expenditure is estimated at R11.9bn, R11.3bn and R12.9bn over the 2013/14 to 2015/16 financial years. In real terms it seems that local government infrastructure expenditure has and will stayed constant at best.

Graph 1: Nominal and Real Local Government Infrastructure Expenditure (R'000, 2003/04 to 2012/13)



(Source: KZN Provincial Treasury)

The Ethekwini municipality accounts for about 50 percent of the above infrastructure expenditure whilst the other 60 municipalities (district and local) account for about 0.9 percent each. New construction work accounts for about 85 percent of the above infrastructure expenditure.

Table 1 suggests that the majority of infrastructure projects are funded from grants and subsidies (national government borrowing) whilst local taxes (other) are also a major funding source.

Table 1: Sources of Finance for Local Government Infrastructure Delivery (as a per cent of total)

Source of Finance	External Loans	Public Contributions and Donations	Grants and subsidies	Other

2003/04.	16.11	0.02	40.55	43.31
2004/05.	18.11	0.87	34.12	46.90
2005/06.	34.71	1.16	44.65	19.48
2006/07	24.97	0.11	56.49	18.43
2007/08	17.77	0.56	49.72	31.95
2008/09	13.32	0.64	54.19	31.86
2009/10	13.19	0.05	48.96	37.80
2010/11	6.15	0.35	57.78	35.72
2011/12	4.90	0.57	53.36	41.17
2012/13	6.08	0.60	57.58	35.73

(Source: KZN Provincial Treasury)

The proportion of grants and subsidies increases significantly when the "big" municipalities i,e,. Ethekwini, Msunduzi, Newcastle and uMhlathuze are excluded. Grants and Subsidies then increase to about 80 percent whilst loans and own revenue decrease to almost nothing. Grants and subsides therefore seem to be the primary source for infrastructure delivery on a local government level.

Table 2 suggests that water and sanitation accounts for the largest infrastructure delivery type. Also interesting to note is the significant increase in expenditure of housing.

Table 2: Classification of Local Government Infrastructure Expenditure (as a per cent of total)

Capital Expenditure	Water and Sanitation	Electricity	Housing	Roads and storm water	Other
2003/04.	26.77	10.09	1.30	3.25	58.59

2004/05.	21.42	10.16	1.24	3.01	64.18
2005/06.	31.85	9.15	0.83	10.50	47.67
2006/07	32.24	11.12	3.13	14.08	39.43
2007/08	27.76	8.77	12.75	13.38	37.35
2008/09	31.93	8.34	3.80	14.83	41.10
2009/10	34.13	8.21	1.90	21.19	34.58
2010/11	32.77	11.77	14.64	16.62	24.20
2011/12	36.35	13.15	16.51	14.64	19.35
2012/13	36.63	11.97	17.95	15.23	18.23

(Source: KZN Provincial Treasury)

3. PUBLIC INFRASTRACTURE AND THE FUNDING GAP IN SA

The Development Bank of Southern Africa (DBSA) in its 2012 "The State of South Africa's Economic Infrastructure: Opportunities and Challenges" report stated that governments around the world rank infrastructure policy among their greatest concerns. The World Economic Forum (WEF) in their 2012 "Strategic Infrastructure Steps to Prioritize and Deliver Infrastructure Effectively and Efficiently" report stated that infrastructure investment, whether it is maintaining existing networks or building new assets, is critical to economic progress. Most countries are not investing enough, which is hampering their growth prospects and deferring an ever increasing burden to the years ahead.

The WEF report states further that most countries' actual investment is well below the required levels, with the global infrastructure gap (the difference between investment needs and actual spending) estimated at about US$ 1 trillion (1.25% of global GDP). McKinsey Global Institute (2013) estimated that the world needs

$57,000bn in infrastructure investment between now and 2030. The $57 trillion required investment is more than the estimated value of today's infrastructure and is just for keeping pace with projected global GDP growth.

Mills (2012) in his article "The Global Infrastructure Investment Deficit" estimated that the global economy was running an infrastructure deficit of anywhere from US$ 40 trillion to $70 trillion. Mills based his estimate on a 2007 Booz Allen Hamilton report that estimated that investment needed to "modernize obsolescent systems and meet expanding demand" for infrastructure worldwide between 2005 and 2030 was around US$ 41 trillion. Norman Anderson, chief executive of Washington DC-based CG/LA Infrastructure, quoted in Mills' article, stated that the OECD's estimated $71 trillion of needed infrastructure.

There seems to be fairly wide consensus that the world is experiencing an ever increasing infrastructure deficit which poses serious risks and challenges. This view seems to be unchallenged. Unfortunately this seems also to be the case in SA and KZN in that there have been over the past number of years a number of articles with regard to the growing infrastructure deficit in SA. Unfortunately one does not just have to read about this, just drive on most of our national or provincial roads, or the recent electricity outages more than sufficiently show case the deficit.

The Development Bank of Southern Africa in 2013 published a report titled "Municipal Planning and Infrastructure Implementation Support - *A Sustainable Governance Framework*" in which they present the following statistics, i.e.,

a) Municipal infrastructure funding needs will increased by R251bn over 5 years (2013 to 2018) and is estimated as follows
    - Metropolitan municipalities = R95bn, secondary municipalities = R50bn and under resourced municipalities = R105bn
b) The infrastructure funding gap will increase by R105bn over the 5 years and is estimated as follows:
    - Metropolitan municipalities R36bn, secondary municipalities = R10bn and under resourced municipalities = R58bn
c) Capital transfers to municipalities, despite growing, are not sufficient to bridge the infrastructure funding gap.
d) Municipal revenues are growing slowly and are under severe pressure, i.e.,
    - Metropolitan municipalities is down to 21% of capital budgets from 30 % in 2006.
    - Secondary municipalities is down to 20% of total capital budgets from 38 % in 2006.
    - Under resourced municipalities is down to 17% of total capital budgets from 32% in 2006

Boshoff (2009) summed up the above situation by stating that indications are that infrastructure assets are deteriorating faster than planned, and that many infrastructure facilities that should be in good working order are overloaded, no longer operational or are in need of complete renewal. Whereas service delivery protests traditionally centered on the lack of access to services, recent protests now include failing service delivery as well.

The view or argument that inadequate infrastructure continues to be a major binding constraint to South Africa's and KwaZulu-Natal's quest for sustained economic growth seems to be well founded and un-challenged. The issue or debate is concerned about the size and growth of the infrastructure gap, which is not the focus of this paper fortunately. The fact is that there is a sizeable and growing municipal infrastructure gap in SA and KZN. The true size of this gap and the growth rate of this gap are really immaterial since the causes of the gap and the problems addressing the gap are independent of the size and growth of the gap. Plugging the funding gap must be a priority irrespective of the size etc.

With the above in mind National Treasury (2013) states that the White Paper (1998 White Paper on Local Government) recognised the need for multiple sources of investment and envisaged municipal infrastructure being funded through a combination of:

(a) capital grants from national government;
(b) local cross-subsidisation; and
(c) the mobilisation of private investment.

With plugging the funding gap as a priority National Treasury in partnership with some key stakeholders commissioned a review of Local Government Infrastructure Grants. According to National Treasury (2013), the review will primarily concern itself with the analysis of (a), which was designed to fund poor communities or households. However there are clear overlaps with (b) and (c), which are supposed to supplement (a) and ensure suitable service delivery to all citizens, poor or

otherwise. However, discussion on the appropriate split between funding sources – (a), (b) and (c) – that a municipality should employ is paramount, especially with regards to large one-off infrastructure projects that might serve both poor and non-poor communities.

5. INTRENATIONAL EXPERIENCE AND LITERATURE WRT PLUGGING THE FUNDING GAP FOR LOCAL GOVERNMENT INFRASTRUCTURE

Baily (2011) submitted a report titled “Innovative Models for Funding Public Sector Infrastructure: UK Case Study” that discusses a number of possible funding models. The report states that there has clearly been a long-term trend in the UK away from the public provision of infrastructure financed from general taxation to private sector provision (through charges and fees) of both infrastructure and related services. The report also states that the long-term trend towards private finance and provision seems to have been driven by a combination of the rising costs of infrastructure, the unwillingness of national and local electorates to pay higher taxes, limitations on grants paid to municipalities by higher tiers of government and acceptance of the need to avoid cost overruns by transferring as much financial risk to the private sector as possible. The trend has been made manifest by requiring developers not just to finance on-site ‘hard’ infrastructure (water supply and sewer systems, roads, drains etc.) but also an increasingly wide range of off-site infrastructure, both hard and ‘soft’ (i.e. environmental, social and community infrastructure).

Some of the many ways of raising public finance for infrastructure are as follows:

- **Property taxes.** Property tax relates payment of local taxes to the capital (municipal tax) or rental (business rates) values of residential and industrial/commercial properties respectively.
- **Property taxes.** Under this funding model, businesses volunteer to pay a levy to finance extra services of direct benefit to the area in which they are located.
- **Supplementary Business Rate.** Levy a supplementary business rate to fund urban development projects.
- **Local Betterment Tax (Planning Gain).** Planning gain refers to a situation where local authorities secure benefits from developers that do not relate to the development itself. Payment in cash or in kind, the latter referring to a developer building a physical facility (such as a bypass road or community centre) and then donating it to the local authority.
- **Local Betterment Tax (Planning Obligations).** They are negotiated agreements between planning authorities and developers, the latter contributing to the cost of infrastructure or services the local authority considers necessary to facilitate a proposed development or offset any adverse impacts it causes.
- **Infrastructure charges (Local Tariffs).** Municipality use formulae and standard charges payable in tranches by developers to fund community facilities and infrastructure needed to support expansion plans.
- **Infrastructure charges (Statutory Planning Charge).** Municipalities apply new planning charges to new developments, alongside negotiated contributions for site-specific matters. Charge income will be used entirely to fund the infrastructure identified through the development plan process.

- **Infrastructure charges (Community Infrastructure Levy).** Municipalities levy the charges against developers in order to provide top-up funding for infrastructure.
- **Infrastructure charges (Social Cost Tariff).** The tariff, payable by developers, would be paid as compensation for communities (via their local municipalities) for wider development costs. It's a shift from a marginal cost (site-specific) approach to the financing of infrastructure by developers to an average cost (municipality-wide) approach.
- **Infrastructure charges (Impact Fees).** Fees payable by developers to cover the broader costs imposed upon municipalities by general urban development. Use of revenues from charges could possibly be ring-fenced both to the site on which they are levied and also to paying for the uses for which they are calculated.
- **Land Value Tax.** Annual land value tax on all sites, built and undeveloped, urban and rural. This is not a transaction tax and therefore should not deter market transactions. It taxes ownership of all land, not just sites at a particular stage of development.

The Federation of Canadian Municipalities (FCM) and the National Research Council (NRC) joined forces to deliver the National Guide to Sustainable Municipal Infrastructure: Innovations and Best Practices (2002). The Guide project aimed to provide a decision-making and investment planning tool as well as a compendium of technical best practices for addressing infrastructure issues. The best practice description focuses on alternative funding. Eight methods of potential interest to municipalities provide options for developing innovative funding sources to meet

infrastructure needs, or to align costs with benefits to users. The municipalities profiled have undertaken these methods in a variety of ways that have evolved in response to their infrastructure and community needs.

According to the research, municipal best practices profiled showed evidence of one or more of the following features:

- innovative funding sources or successful user-pay approaches to fund infrastructure;
- recent approval for significant infrastructure investments or expenditures, especially significant transportation works;
- infrastructure investments to support quality of life in the community and/or to achieve corporate objectives;
- evidence of a structured decision-making matrix for funding allocation decisions that formally compares or rates municipal infrastructure functions with other municipal services; and
- evidence of a formal process to gain public and special interest group input or support for infrastructure funding requests.

The alternative funding mechanisms are profiled and presented in the guide includes the following:

- **Special Levies**. This method refers to economic instruments (a particular residential or commercial tax, a general levy on the property tax or a rate base/utility levy for residential and/or commercial properties for example) that ensure a funding source exists to cover needs that are difficult to fund through user pay, and for which there is a benefit in explicitly identifying them

separately from the general tax levy. Typically, this method is accompanied by a special fund established by the municipality to manage the special levy revenues.

- **Development Fees.** In its basic form, this method is an economic instrument that ensures municipalities have a revenue source to fund the municipal infrastructure required as a result of new private developments. Development fees can also be used to ensure a future reserve fund exists for operations and maintenance of infrastructure. In their basic form, development charges are not particularly new or unique; however, they can be used innovatively by municipalities to influence development in accordance with the community's strategic planning and economic goals. Ultimately, a well-designed development fee structure is a tool linked to planning processes for the delivery of infrastructure that suits the community's vision and for which new needs are proportionately funded by new users of the infrastructure.
- **Utility Models.** The utility model entails management of capital assets, operations and maintenance on a cost-recovery basis through fees for service. The fee for service must be sufficient to fund the needs of the infrastructure and overhead operations, such as administration, bill collection and management. Only users of the service support the service through the fee for service. The amount paid by users is normally proportional to their use of the service.
- **Sponsorships.** Corporate sponsorships allow private companies to get some form of public recognition through advertising, signage or monuments, for example, in exchange for significant donations or strategic funding arrangements to cities to pay for the O&M of facilities or recreational areas.

The approach could also include the involvement of local groups and organizations in the actual labour for O&M of recreational areas. Sponsorships typically increase the profile of the private contributor or group among members of the public. The technique can be used in any type of municipality, for a variety of aspects.

- **Strategic Budget Allocations.** With this approach, a private company or non-governmental organization forms a partnership with a municipality often, but not necessarily, following an open competitive bid process. This arrangement could be established for road or bridge infrastructure, utilities such as water and sewer, solid waste services or recreational facilities. The partnership could be a specific infrastructure project or for a package of services, or even an exchange of services. The method typically involves private sector capital financing, often including private operation and maintenance services for a set period. The arrangement could have the municipality providing a monthly lease rate to the private contractor, a private contractor funding the service with a user rate charge or a regular municipal grant to a non-governmental organization to provide a service. A municipality usually involves a partner if the partner is able to provide the service at a lower cost, for the same or higher level of service. Often, a private partner is willing to finance the capital for a project in exchange for a set rate or lease agreement, which allows a municipality to meet a need without having to raise the capital to finance a project.
- **Funding Partnerships.** The method entails strategically setting aside certain moneys collected from a portion of the tax bill or a portion of a rate bill into a special fund. The special fund is invested, and interest earned is reinvested,

with the goal of having a special fund for certain types of capital for future needs. Strategic budget allocations ensure a secure source of revenue in the face of declining funding, so there is improved security for certain categories of infrastructure.

In 2013 a consortium led by Pagyses (www.pegasys.co.za) submitted a report titled "An Assessment of Institutional Options for Infrastructure Financing Concept Note - Version 2.2". The project was commissioned by the Department of Water Affairs to revise the Pricing Strategy for water use charges and to develop a Funding Model for water infrastructure development and use. The report focused in part on the capital finance required to fund the development and possibly the initial operation (working capital) of the water and related infrastructure. The report further states that it is important to note that a specific project may be financed using more than one of the identified sources, depending upon the purpose and nature of the infrastructure and the institutional option that is used to enable the financing. The identified sources of financing include the following:

- **Fiscal Support.** It is not relevant whether this is obtained through general taxation or treasury bonds.
- **Public Sector Utility Reserves.** Public sector institutions may build capital reserves though tariffs that are designed to exceed costs, which are intended to be used for infrastructure expansion, upgrading or refurbishment.
- **Commercial Finance through Loans and Bonds.** Access commercial sources of finance through loans or bonds. The critical requirement for this debt is the sustained income stream that the associated asset/s can generate to repay the capital and interest.

- **Equity Investment**. Equity investment by the private sector may be through a public-private partnership (PPP) or an entirely private concession.
- **Donor Support and Green Funds.**

The Business Council of Australia in 2013 released a report titled “Securing Investment in Australia’s Future - Infrastructure Funding and Financing” in which they amongst others state that Australia has a significant challenge ahead to ensure infrastructure provision in the transport, energy, water and communications sectors, and social infrastructure, keeps pace with growth and helps to lift productivity. The report further states that a number of recent reports have highlighted the declining capacity of government budgets and balance sheets to fund new infrastructure, and the importance of attracting more private capital into infrastructure provision. There is, according to the report, no shortage of private capital to achieve this; the challenge is to create an environment for private investment in infrastructure, including designing every public infrastructure project for private investment either upfront or over time.

The report further states that infrastructure financing policies also need to address barriers preventing more private investment in infrastructure projects from emerging sources such as pension funds. Policy should support the sale of mature public assets to private owners, with the funds received by governments recycled into new infrastructure investment. Capital markets should evolve to enable more private investment in infrastructure debt and equity where there is investor demand. All the stops must be pulled out to reduce the high cost of new infrastructure project

construction in Australia. The high cost of provision erodes the value of both private and public investment and lowers the economic and social returns to the community. The report makes several recommendations to support the infrastructure drive in Australia, for example:

- **Expand the use of the PPP** process and consider it for all major infrastructure projects. PPPs have been shown to lower project costs, reduce construction times and bring innovations in design and construction. Governments should continue to reduce the cost and risk of the PPP process to bidders by considering options for reimbursing some bid costs for losing bidders and implementing a streamlined PPP model for smaller projects.
- **Develop capital markets** to create more options for private investment in infrastructure debt and with an aim to extend the tenor of debt for Australian investments. Privatisation itself should create the conditions for the development of a long-term corporate bond market.
- **Remove barriers** to infrastructure investment caused by distortions in the tax system
- **Develop infrastructure markets** – especially water, electricity and roads – to move towards greater private investment and pricing that reflects full-cost recovery and a return on investment, with appropriate regulation in place to safeguard consumers and encourage efficient investment.

Nedbank Capital in their 2013 quarterly African Infrastructure Review states that the solution to the yawning infrastructure gap, increasingly, has been to turn to the private sector for support in the shape of **public-private partnerships** (PPP) that

can accelerate infrastructure development by tapping into the private pool of financial and technical resources available. PPPs enable public and private resources to work together to achieve goals beneficial to both entities and have been used to finance, build and operate projects as diverse as public transportation networks, power generation and distribution, road and rail networks, telecommunications, water and sanitation. Its choice, rather than the conventional option of public procurement, rests on the proposition that optimal risk sharing with a private partner delivers better value for money both for the public sector and, ultimately, the end user.

According to the review, the reasons the low level of PPP activity include cost overruns or renegotiations on previous projects and what has been dubbed the “project preparation gap” – a lack of well-prepared, bankable projects. Those PPPs in Africa that have worked best, according to Nedbank, have been characterised by thorough planning, good communications and effective monitoring, regulation and enforcement by governments. While the principal is simple enough, the real challenge lies in constructing a framework and relationship that works efficiently and effectively. It is against this background that a 2013 report from the World Economic Forum, in collaboration with the Boston Consulting Group, calls for a “step change” in the quality of infrastructure project preparation and attempts to set out a framework and best practice guidelines for helping governments to bring it about. It claims that typical preparation issues include insufficient project management and leadership, biased demand forecasts, delayed approvals and land acquisition, low stakeholder engagement and unbalanced risk allocation. Problems such as these, the report says, have not only stopped many projects from launching but have led to

later problems for those that have been undertaken. The report, according to Nedbank, highlights four PPP “best practice” areas:

- Rigorous project-preparation
- Bankable feasibility studies
- Balanced risk allocation and regulation
- A conducive enabling environment

Peterson (2014) published an article on the Forbes website (http://www.forbes.com/sites/realspin/2014/01/21/bridging-the-infrastructure-funding-gap/) stating that Governments and banks – driven by deficit reduction and new regulations–- are likely to continue holding back on infrastructure financing. But institutional investors and the **financial markets (project bonds for example)** that recycle their capital have the potential to step into the breach. They offer a huge and growing pool of savings that could be rationally and profitably deployed in the infrastructure sector.

The attractions, according to Peterson, are plain to see. Infrastructure investments tend to offer stable and predictable cash flows over the long term (typically 20 to 30 years), which can be structured to suit the long term liabilities of pension funds and insurers. They are a good match for the investment horizons and risk appetites of many sovereign wealth funds, Islamic finance institutions and other fast growing funding sources. Default rates, according to S&P data, are lower than for corporate debt and returns are generally uncorrelated with other asset classes.

However, Peterson further states that it will require political leadership, innovative thinking by financiers, and new economic incentives to coax wary investors into the idiosyncratic world of infrastructure. This is politically sensitive territory. Involving private investors in public service providers means striking the right balance between the interests of investors, taxpayers and consumers. There are, though, some practical steps that can help unlock more institutional funding.

First, there should be more transparency of investment risk. That means more standardised transaction structures, a visible project pipeline and more information about project performance. Second, the political and regulatory framework needs to be predictable. Investors are discouraged by unanticipated policy changes. Third, incentives may be needed to entice capital market investors into funding projects at the outset rather than simply after completion.

The Australian Government in 2014 released the Productivity Commission Inquiry Report Volume 1. The aim of the study was to undertake an inquiry into ways to encourage private financing and funding for major infrastructure projects, including issues relating to the high cost and the long lead times associated with these projects.

The report states that in essence, the funds to pay for public infrastructure ultimately have to come from those who benefit from it (through direct charges on users and other beneficiaries) or from the wider community through their governments (using

taxation and other sources of public revenue). The report highlights various mechanisms to fund public infrastructure, i.e.,

- **User charges** - In principle, user charges (prices) based on the (efficient) cost of provision should be the default option for funding infrastructure. By giving individuals a clear signal about the cost of infrastructure, they will have an incentive to use it efficiently.
- **Value capture** - Value capture is an approach that seeks to fund infrastructure from a wider range of beneficiaries than users. Four value capture methods are discussed in the report:
    - betterment levies; individuals and businesses in a given area are required to fund specific infrastructure.
    - tax increment financing; tax increment financing uses the expected increase in property tax revenue as security to finance the infrastructure.
    - hypothecation of tax increments to an infrastructure fund; reinvesting some of the returns from past projects back into an infrastructure fund
    - property development; selling development rights as part of a tender to build public infrastructure.
- **Developer contributions** - Developer contributions are up-front contributions that property developers are required to make to infrastructure associated with the land they develop.

Gianoli and Bongwa (2013) in the Africa Infrastructure Investment report published on behalf of the Commonwealth Business Council by Commonwealth Business

Communications Limited states that local governments in African Commonwealth countries can finance infrastructure projects in two main ways, **borrowing** and their own financial resources (e.g. intergovernmental transfers, property taxes and revenue generating facilities), and **public-private partnerships**. In African Commonwealth countries financing systems are often built around property taxes and transfer schemes. They further argue that it is reasonable to argue that in general resources have not increased in proportion with local authorities' infrastructure investment needs

Gianoli and Bongwa (2013) also argue that direct bond issuance is likely to remain a limited option in the near future due to legislative constraints as well as the low borrowing capacity and lack of creditworthiness that characterises the vast majority of cities. PPP's have also not performed much better in that PPP's have delivered below expectation, mainly due to the fact that the urban services that are commercially viable are limited.

There is a clear need for a radical change of scale in the financing volumes for infrastructure across cities in African countries. Four crucial areas where intervention is urgently needed, according to Gianoli and Bongwa (2013), are:

- **Decentralisation processes and endogenous financing** - empowering local governments to generate their own resources to finance investments in infrastructure.
- **Local Financial Markets** - Policy environment for general Municipal bonds or project specific bonds that taps into pension and mutual funds need to be developed and strengthened.

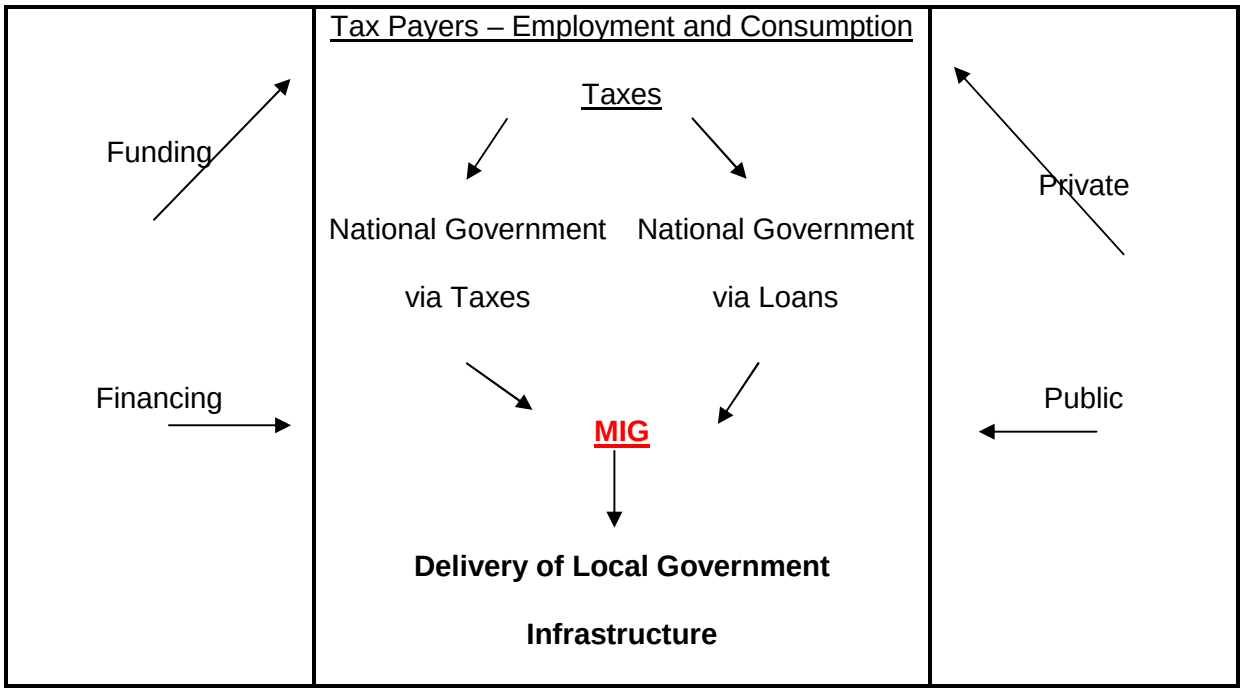
- **Land-based financing mechanisms** - Land sales and other mechanisms for capturing land value increases through betterment levies, impact fees and developer exactions.
- **Development Bank for Infrastructure** – The established of Development Bank for Infrastructure could provide a channel for borrowing through which municipalities could finance economically productive infrastructure investments.

6. THE FUNDING-FINANCING NEXUS

The majority of local government infrastructure in SA and KZN is financed by national government grants, most notably the Municipal Infrastructure Grant (MIG). The MIG is specifically designed to finance infrastructure delivery at a local government level. MIG is a capital grant from national government. It combined all the existing capital grants for municipal infrastructure into a single consolidated grant. MIG provides grant finance to cover capital costs of basic infrastructure for the poor. The funds are determined by formula, and are paid into the bank account of the municipality according to a MIG schedule agreed to with the municipality.

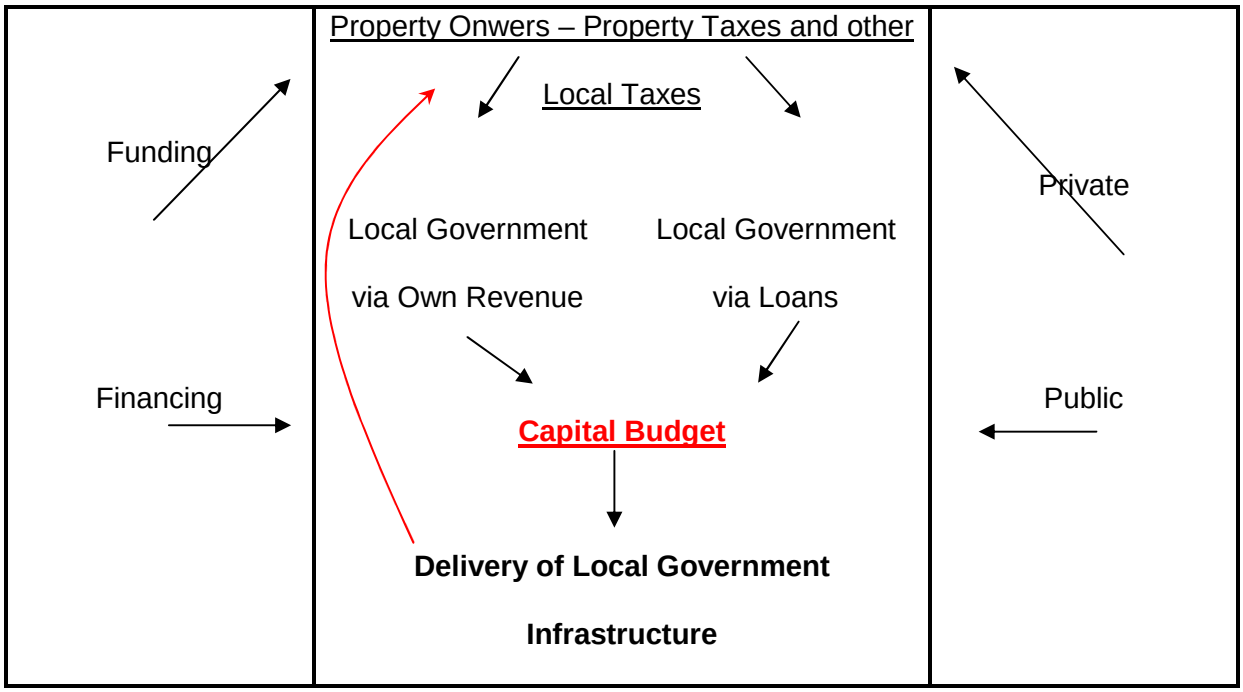
The MIG is funded by the tax payers directly through employment and consumption taxes or through national government loans which are ultimately funded by the tax payers. The diagram below displays the MIG funding and financing model for local government infrastructure delivery. It shows that the funding of the MIG is private, but the financing is public.

Diagram 1: MIG Funding and Financing Model for Local Government Infrastructure Delivery



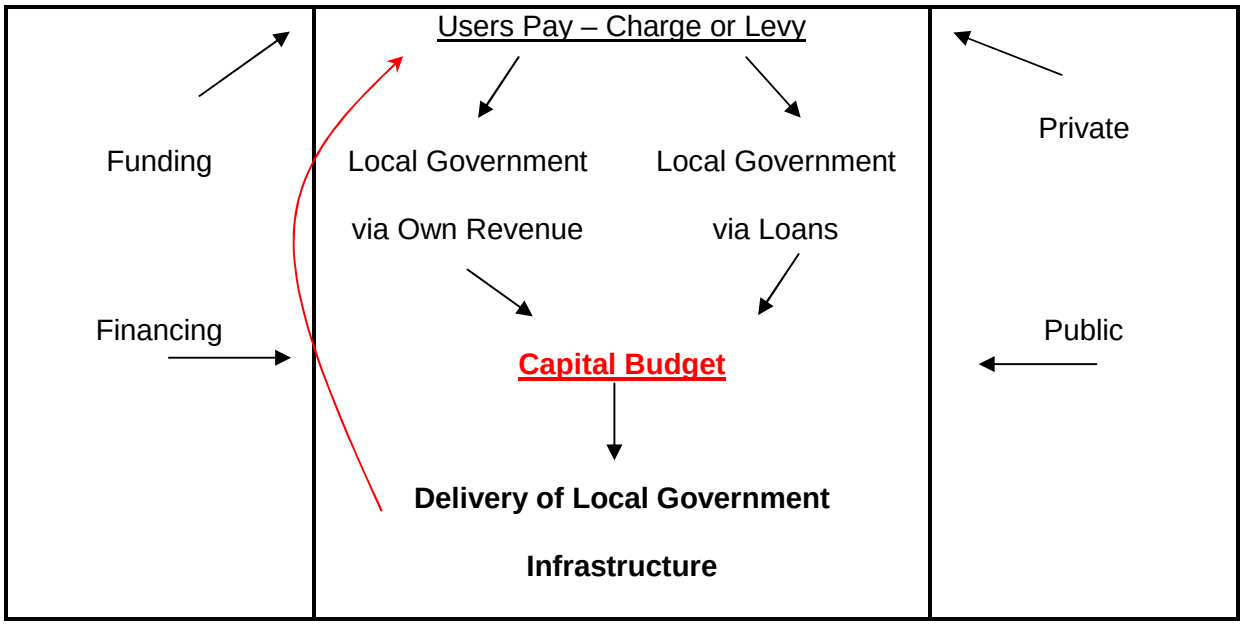
A second funding and financing model is the use of "local tax revenue" for infrastructure delivery. Local Government has a number of tax powers, i.e., they derive revenue from implementing local government taxes, most notably property taxes. Property taxes are a stable form of revenue since it allows only limited tax exportation. It acts as a rough form of benefit charge as well. Property rates are calculated on the value of the land and of any improvements or buildings. This value is based on the property's market value. Infrastructure delivery is then financed through some appropriation (capital budget allocation) from the municipalities' "own revenue" or the municipality can borrow money against the future "own revenue" to finance the infrastructure. The diagram below displays the "own revenue" funding and financing model for local government infrastructure delivery. It shows that the funding of the capital budget is private, but the financing is public.

Diagram 2: Capital Budget Funding and Financing Model for Local Government Infrastructure Delivery



A third funding and financing model is the use of "user chargers or fees" for infrastructure delivery. Local Governments provide services to their customers, i.e., residents, and in return the customers must pay for the services they receive, for example water and electricity. User charges differ from taxes in two important ways. First, user charges are a charge to people and businesses for benefits they receive specifically; taxes are general charges for services that benefit everyone in roughly equal shares. Second, user charges are to some extent voluntary and avoidable, while taxes are compulsory. Infrastructure delivery is then financed through some user charge mechanism directly or the municipality can borrow money against the future user charges to finance the infrastructure. The diagram below displays the "user charges" funding and financing model for local government infrastructure delivery. It shows that the funding of the capital budget is private, but the financing is public.

Diagram 3: User Charges Funding and Financing Model for Local Government Infrastructure Delivery



The above three models focus on the various sources of municipal income, i.e., funding is generated/collected by the municipality either from national government (MIG) or from its residents and businesses (taxes and charges). There are various sources of income (Education and Training Trust, http://www.etu.org.za/) that can be used by municipalities to finance their expenditure, for example:

- **External loans -** External loans from a bank or other financial institution such as the Development Bank of Southern Africa.
- **Internal loans -** Many municipalities have internal "savings funds" such as Capital Development Funds or Consolidated Loan Fund.
- **Contributions from revenue -** When purchasing a small capital item, the small total cost can be paid for from the operating income in the year of purchase. In most municipalities, this source of financing is used to pay for smaller capital items, such as one or two items of furniture and equipment.

- **Government grants -** Municipalities may apply to national government for grants for infrastructure development. The two main funds available are:
    - MIG [Municipal Infrastructure Grant]
    - Water Services Projects
- **Donations and public contributions -** Local and foreign donors may sometimes donate a capital item or money to be used specifically for the purchase of a capital item.
- **Public/Private Partnerships -** Capital costs can be paid for by means of partnerships between the private sector and the municipality.
- **Property Rates -** All people and businesses who own fixed property (land, houses, factories, and office blocks) in the municipal area are charged "Property Rates" - a yearly tax based on the value of each property. Rates income is used by the municipality to pay for the general services to all people.
- **Service Charges / Tariffs -** For specific services that can be directly charged to a house or factory. That is, to charge a price or "tariff" for services such as water, electricity or approval of building plans; where the exact usage of the service can be measured, to the person or business who actually used that service.
- **Fines -**Traffic fines, late library book fines, penalties for overdue payment of service charges: these fines are another source of income or "revenue".
- **Equitable share** - The equitable share is an amount of money that a municipality gets from national government each year.

For municipalities to increase the delivery of infrastructure and close the funding gap based on the above three models and including the sources of income as highlighted above the following will have to happen:

- National Government will have to increase the size of the MIG or the equitable share, i.e., allocate more funding to the MIG and/or equitable share. This can be done by either increasing the revenue sources of the national government (increase taxes etc) or through the re-allocating of funds (move funds from one or more commitments to the MIG and/or equitable share).
- Local Government can increase their current property and other taxes, expanding the tax base to new payers and/or implement new taxes.
- Local Government can increase their charges and fees, expanding the base to new payers and/or implement new charges and fees.

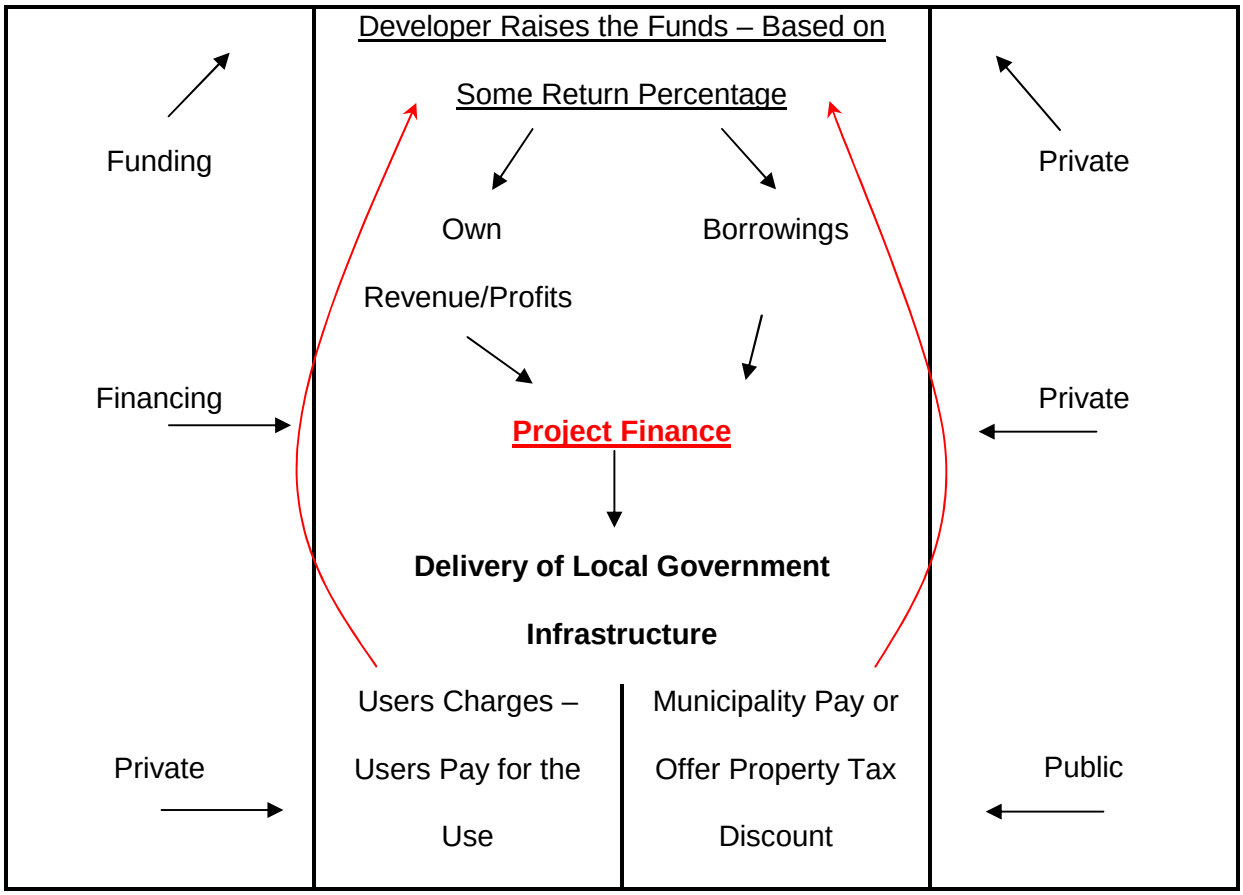
The above options, especially the latter two, seem to be of particular interest to Baily (2011) that suggests the implementation of a number of innovative local taxes to fund the delivery of infrastructure. The Federation of Canadian Municipalities (FCM) and the National Research Council (NRC) (2002) puts their focus on the implementation and expansion of user charges and fees for the delivery of infrastructure. Pagyses (2013), Business Council of Australia (2013), Nedbank Capital (2013), Peterson (2014) and Gianoli and Bongwa (2013) in their proposals do include “new” taxes and charges, but their focus is predominantly on non-traditional methods or alternative funding mechanisms.

The immediate past and current socio-economic environment also suggests that the ability to increase and/or expand national and local taxes and charges are extremely

constrained and undesirable. There seems to be very little or no room to substantially increase the revenue base of municipalities. Schüssler (2010) argues that the rise in municipal own revenue in past years has been substantial on the residents and businesses. This has been accompanied by a swift decrease in money available for other spending. Municipalities have been finding new charges such as dustbin rental, network charges and demand side management charges. Service fees for pet licenses etc. are also finding big increases as municipalities search for ways to increase revenue. Services such as water, sewerage, sanitation and waste all attract charges at present while before only water and lights as well as property rates were taken into account.

The above three models are based on the standard or traditional public finance mechanism for local government infrastructure delivery. The three models are privately funded, but financed by government. A fourth options looks at the possibility of private funded and financed infrastructure delivery, i.e., the private sector fund and finance the local government infrastructure delivery. In the private funded and financed model the private sector allocates funds through either retained profits or borrowings towards the infrastructure delivery. The developer therefore funds and finances the project based on some estimated future rate of return percentage. The return on the infrastructure delivery is derived from user charges or some payment or discount agreement with the municipality.

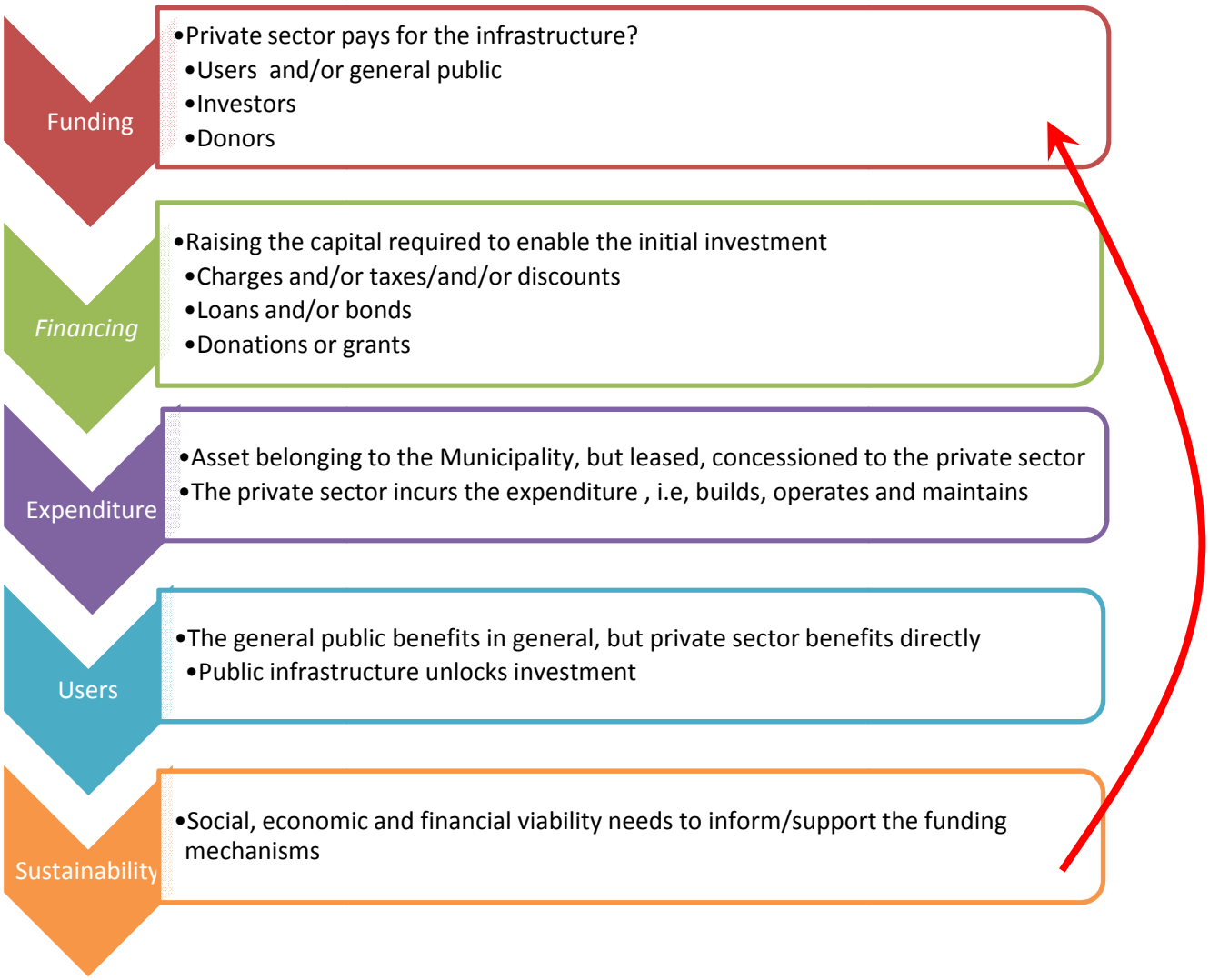
Diagram 4: Private Funding and Financing Model for Local Government Infrastructure Delivery



The difference between the public and private model is essentially the financing mechanisms of the infrastructure delivery and not the funding. The funding mechanism is private (consumers and businesses) irrespective whether the model uses the public or private financing mechanism. Given the constrained ability by local government to increase and expand taxes and charges it seems fairly obvious that the use of the first three models will continue to be of limited value to expand on the delivery of public infrastructure. It is not really desirable or feasible to put in place betterment taxes, land value taxes, infrastructure charges or development fees. This will just add to the cost of doing business and deter/constrain local investment, local competitiveness and local growth.

The diagram below displays the possible non-traditional or alternative local government infrastructure delivery process flow (with reference to the above 4th model). The process starts with the funders, i.e., who pays, and then focuses on the financing mechanism (private finance mechanism). It then focuses on the ownership of the infrastructure and who will be responsible for the actual delivery of the infrastructure, i.e., private vs. public delivery. It also focuses on the users of the infrastructure and the sustainability of the infrastructure.

Diagram 5: Non-Traditional or Alternative Local Government Infrastructure Delivery Process Flow



7. NON-TRADITIONAL OR ALTERNATIVE LOCAL GOVERNEMNT INFRASTRACTURE FUNDING MECHANISMS

The literature makes reference to the below non-traditional or alternative mechanisms. It must be stated that some of them have been or are being used in some way or form, but only by a very limited number of municipalities. They are not the norm, but rather the exception and it's not because they cannot work, but rather because of a limited understanding and appetite to employ them. Some of them are also politically not very desirable.

- Sponsorships/Donations and Grants – This is an ideal source of funding for infrastructure delivery since there is no costs involved, i.e., it does not increase the total costs of the investment/project. Unfortunately scarcity of funds persists. The sponsorship/donation or grant can be directly made to either the private or the public.
- Commercial Finance through Loans and Bonds/ capital markets – This source of funding has huge potential and is in general very seldom used. However the source is only available for the few big municipalities, can potentially be expensive and is politically sensitive. Also some municipalities are over-borrowed so they have little room to increase their borrowings. On the other hand there is no reason why the private sector cannot make the loan or issue the bond within an agreement with the public.
- Equity Investment/infrastructure markets – This really refers to the Public Private Partnership mechanism, which theoretically is attractive, but practically there seems to be very little appetite from both the private sector

and public sector side to enter into PPP's. However the potential is there if the cost and risk associated with the PPP process can be lowered.

- Economic/Financial incentives/Developer Abatement – This source of funding relates to the use of the municipal tariff and taxes policy for infrastructure delivery. It uses the tax and charges instruments of the municipality as incentives. This is the mechanism that will be discussed in more detailed below since it's the author's view that it holds the most potential.

Many local governments offer incentives for current and/or potential investors. The offering of investment incentives and business attraction and retention measures seems to be a worldwide practice in both developed and developing countries, provinces and cities. Governments including local governments offer such incentives to attract and grow investment, to steer investment into favoured industries and/or regions, or to influence the character of an investment. Governments also use such incentives as business retention measures to either (a) keep a business from leaving or (b) try to keep a facility from shutting down, i.e. to assist a business in distress (see for example City of Cape Town, Johannesburg and Nelson Mandela Bay Municipality investment incentive policies).

The fundamental or underlying principle/s of the economic/financial incentives/developer abatement funding mechanism is identical to the well used and widely accepted business attraction and retention incentive policy method. The municipality has some goal or objective, i.e., increased investment, job creation amongst others. The municipality does not have the means to directly achieve the objective and therefore is dependent on an external party (private sector) to achieve

the objective. Unfortunately the risk/reward trade-off or value proposition for the external party is insufficient to support the municipality in achieving the objective. There is no reason for the external party to support the municipality in achieving its objective and therefore the municipality has to convince or persuade the external party to support it. The use of financial and/or non-financial instruments are the primary tools at the municipality's disposal. The municipality uses these financial and/or non-financial instruments to convince or persuade the external party to enter into a mutual beneficial agreement that will help the municipality achieve its objective.

The very same scenario as above can be applied to the delivery of public infrastructure, i.e., the municipality has some infrastructure delivery objective. It does not have the means (funding) to achieve the objective and therefore has to convince/persuade an external party to support it. The municipality has to offer the external party financial and/or non-financial incentives to enter into a mutually beneficial agreement. Without the financial and/or non-financial incentives there is no reason for the external party to enter into the agreement.

Critical to the success of these incentives for both parties are the following:

- Must be a combination of financial and/or non-financial incentives
- The financial and/or non-financial incentives should be relevant to the new public infrastructure only and only if it's part of a larger residential, commercial or industrial development

- The financial and/or non-financial incentives will then be applicable to the full development, i.e., the incentives on the development compensates for the costs of the delivery of the public infrastructure
- Financial incentives can include exemptions or discounts on inter alia properly taxes, building plans and capital contributions and concessions on water, electricity and refuse removal services, but only for the new. This will ensure that there are no direct budget implications for the municipality.
- The municipality does not directly fund the development. The developer funds the development including the public infrastructure. However, the municipality forgoes the full rates and taxes benefits of the development for a certain numbers of years to compensate the developer for the public infrastructure (opportunity costs for the municipality).
- The municipal incentives must focus on the cash flow of the development and not the capital expenditure of the development.
- The financial and/or non-financial incentives must not require a complex administration.

8. CASE STUDY ANALYSIS OF THE ECONOMIC/FINANCIAL INCENTIVES/DEVELOPER ABATEMENT FUNDING MECHANISM

Gupta and Rea (1978) state that the value of the development (V) is comprised of two factors, i.e., the structure **(V_k)** and the land (V_l). The present value of the structure is explained by

$$Vk = \sum_{t=1}^{n} \frac{(R - C)}{(1 + i)t}$$

where:

R = Revenue

C = Costs

t = time period

n = expected life span of the structure, which is assumed to be quite large

$(n \rightarrow \infty)$

The value of the land (V_l) is assumed to be exogenous to the value of the structure, but dependent on the location and is a function of time, i.e., $V_l = ℓ(t)$. It is also assumed that the public infrastructure (Vp) is a necessary condition for the development. Revenue related to the development can be expressed as a combination of two separate factors: (1) sales (rents and/or production) derived from the structure; and (2) equity accrued from the appreciation of the property (V_k plus V_l).. The revenue generating capability of a property is a direct function of capital investment (x), subject to a diminishing rate of return. The cost to the developer can be expressed as a combination of five separate factors: (1) interest payments which are a direct function of the capital investment (investment that include the public infrastructure (x_p) which is required by the development (x_d)); (2) the tax on the structure; (3) the tax on the land; (4) municipal service charges and fees; and (5) the cost of maintenance and rehabilitation.

The cost function can be written as:

$$C = ix + ƛV_k + ƛ^{\alpha}V_l + s(t) + m(t)$$

where

i = interest rate

x = capital investment plus public infrastructure investment ($x = x_d + w_p$)

ƛ = tax rate

m(t) = cost of maintenance which is a function of time (M = m(t))

$\alpha \neq 1$ if land and structure have different tax rates

s(t) = municipal service charges (electricity, water, etc) which is a function of time (S = s(t))

Profit (π) on investment is expressed as the difference between revenue and costs:

$\pi = R - C$

Rearranging and substituting the various above formulas into the profit function we obtain:

$$\pi = Rf(x) - \frac{1}{1+\theta}[ix + \theta R + ƛ^{\alpha} ⌇(t) + s(t) + m(t)]$$

where

$$\theta = \frac{ƛ}{i}$$

The condition for profit maximization will be satisfied when the marginal rate of return on investment (R'[f'(x)]) is equal to the market rate of interest (i) plus an added tax on increased revenue deflated by the market rate of interest ($\frac{ƛ}{i}$ R'{f'(x)]).

The cost of the development increases by the costs of the public infrastructure ($x = x_d + x_p$). This will in many instances make the development financially unviable,

therefore the development will have to be compensated for the increase in capital costs. The municipality will not be able to directly reimburse the development, but can indirectly reimburse the development, i.e., using a tariffs and taxes abatement programme. This they can do by:

- Decreasing ƛ (tax rate on the development structure and land; public infrastructure is taxed exempt)
- Decrease s(t) (service charges and fees; public infrastructure doesn't carry any charges and fees)

The condition for the development to proceed will be satisfied when:

$$ƛ_d V_k + ƛ^{\alpha}_d V_l + s(t)_d \geq i x_p$$

where

d = abatement offered by the municipality

The above model is applied using a proposed development near Umkomaas. Umkomaas is a small coastal town on the subtropical south coast of KwaZulu-Natal and is located in the Ethekwini Metropolitan Municipality. The proposed development amongst others includes the construction and operation of an airport and race track precinct. The airport will be very similar in runway dimensions (1650 by 30 meters) to the Pietermaritzburg regional airport. The race track will be 5 822 in length and will be able to host many different types and classes of motor and motorcycle racing. The estimated cost for the airport is R510m over a 3 year period and R780m over a 5 year period for the race track. However public infrastructure (waste water

treatment plant and road access) worth about R260m over a 2 year period is needed for the development to proceed.

The public infrastructure is a necessary condition for the precinct development. It is the responsibility of the relevant municipality to supply the public infrastructure, but that is assuming that it does have the financial resources. If not then there are basically two choices, i.e.,

- The development cannot proceed until the municipality finds and allocates the financial resources
- An alternative funding model is used to finance the public infrastructure

Given the socio-economic imperatives of the country and the province and the financial constraints faced by all of the municipalities the focus will and must be on the second option.

The Ethekwini tariff and tax schedule for the 2013/14 financial year relevant to the development is displayed in the table below.

Table 3: Ethekwini Tariff and Taxes Schedule

Service	Type of Tariff or Tax	Unit	Classification	Value
Water	Monthly consumption charge	kilolitre		R 14.59
Water	Monthly fixed charge calculated on a daily basis on meter size	R	Scenario 1	R 6 403.59
Water	Monthly fixed charge calculated on a daily basis on meter size	R	Scenario 2	R 11 384.19
Electricity	Industrial Time of Use Tariff	cents per unit	Low Demand Season, Standard	R 0.48
Electricity	Industrial Time of Use Tariff	cents per unit	High Demand Season, Standard	R 0.63
Electricity	Industrial Time of Use Tariff	R	Service	R 2 374.15

			Charge	
Electricity	Industrial Time of Use Tariff	R	Access Charge	R 20.00
Electricity	Industrial Time of Use Tariff	R	Maximum Demand	R 65.50
Refuse	Sanitation charges - Commercial	cubic Metre	Volume charge	R 87.00
Rates	Business and Commercial	cents per Rand	Rate randage	R 0.0221
Rates	Industrial	cents per Rand	Rate randage	R 0.0286
Rates	Public service infrastructure	cents per Rand	Rate randage	R 0.0024

The following are further assumptions with respect to the development.

Table 4: Assumptions wrt the Development

		Input
Annual Water Consumption year 1	kilolitre	4 500
Annual Electricity Consumption year 1	units	250 000
Annual Refuse Consumption year 1	cubic Metre	2 000
Year One Total Revenue year 1 to 5	Rand	0
Year One Total Revenue year 6	Rand	R250m
Interest Rate (nominal, pa)		11.00%
Developer Risk Premium for Financing the Public Infrastructure (pa)		12.00%
Total Revenue Increase (pa)		8.00%
Number of Years		25
Municipal Tariffs and Taxes increase per annum by upper inflation target band		6%
Change in Annual Property Value		1%
Change in Annual Water Consumption		0%
Change in Annual Electricity Consumption		-1%
Change in Annual waste Consumption		2%

The table below displays the total annual municipal account for the development and the total annual repayment on the public infrastructure borrowing requirement.

Table 5: Annual Municipal Account vs Annual Borrowing Repayment Requirement

	Total Municipal Account	Total Public Infrastructure Loan Repayment + Risk Premium
Year 1	R 33 209 897.48	R 34 249 071.36
Year 2	R 35 204 231.33	R 34 249 071.36
Year 3	R 37 318 347.01	R 34 249 071.36
Year 4	R 39 559 439.96	R 34 249 071.36
Year 5	R 41 935 137.93	R 34 249 071.36
Year 6	R 44 453 526.99	R 34 249 071.36
Year 7	R 47 123 179.05	R 34 249 071.36
Year 8	R 49 953 181.06	R 34 249 071.36
Year 9	R 52 953 165.98	R 34 249 071.36
Year 10	R 56 133 345.59	R 34 249 071.36
Year 11	R 59 504 545.24	R 34 249 071.36
Year 12	R 63 078 240.80	R 34 249 071.36
Year 13	R 66 866 597.69	R 34 249 071.36
Year 14	R 70 882 512.36	R 34 249 071.36
Year 15	R 75 139 656.24	R 34 249 071.36
Year 16	R 79 652 522.26	R 34 249 071.36
Year 17	R 84 436 474.31	R 34 249 071.36
Year 18	R 89 507 799.53	R 34 249 071.36
Year 19	R 94 883 763.84	R 34 249 071.36
Year 20	R 100 582 670.76	R 34 249 071.36
Year 21	R 106 623 923.76	R 34 249 071.36
Year 22	R 113 028 092.44	R 34 249 071.36
Year 23	R 119 816 982.56	R 34 249 071.36
Year 24	R 127 013 710.42	R 34 249 071.36
Year 25	R 134 642 781.56	R 34 249 071.36

Applying the discount profit maximizing model as discussed above yields the following results.

Table 6: Development Appraisal Results (25 years using 11% discount rate)

Measure	Value without the abatement offered by the municipality	Value with the abatement offered by the municipality

Net Present Value	R 65 598 063.07	R 348 536 442.28
Internal Rate or Return	11.60%	14.47%
Modified Internal Rate or Return	10.40%	11.83%

The above results suggest that it's indeed viable for the developer to supply the public infrastructure need for the development. On the other hand the municipality would receive about R172m worth of tariffs and taxes from the development over the 25 years discounted at 11% pa. The municipality will also receive ownership of the R260m public infrastructure.

The table below indicates the total repayment plus the risk premium as a percentage of the total municipal account per annum. It's clear that the opportunity costs (loss of potential income) to the municipality with respect to the discount or abatement decreases fairly rapidly over time.

Table 7: Total Repayment plus the Risk Premium as a Percentage of the Total Municipal Account (opportunity costs to the municipality)

	As a %
Year 1	103.13
Year 2	97.29
Year 3	91.78
Year 4	86.58
Year 5	81.67
Year 6	77.04
Year 7	72.68
Year 8	68.56
Year 9	64.68
Year 10	61.01
Year 11	57.56

Year 12	54.30
Year 13	51.22
Year 14	48.32
Year 15	45.58
Year 16	43.00
Year 17	40.56
Year 18	38.26
Year 19	36.10
Year 20	34.05
Year 21	32.12
Year 22	30.30
Year 23	28.58
Year 24	26.96
Year 25	25.44

The summary statistics for the development with the abatement are as follows:

- The public infrastructure costs account for 20% of the development costs
- The development would receive on average a 55% abatement over the 25 years
- The viability of the project increases 5 times with the abatement over the 25 years at 11% pa discount rate
- The municipality receives about R431m worth of financial rewards over the 25 years at 11% pa discount rate
- The opportunity costs for the municipality decreases about 5.6 percent per annum

6. SUMMARY AND CONCLUSIONS

Fixed capital formation is arguable one of the most important economic variables in South Africa. There is a wide consensus that fixed capital formation is a must if the country is to increase its economic growth rate to levels needed to address poverty

and inequality. There is also consensus that public fixed capital formation is absolutely pivotal for private fixed capital formation.

The reality is unfortunately that public fixed capital formation is inadequate to facilitate and support private fixed capital formation, especially at a local government level. The majority of municipalities simply do not have the financial resources to supply the needed public fixed capital and therefore private sector fixed capital formation is effectively discouraged. It is therefore of vital importance that careful but enthusiastic consideration is given to the use of alternative funding models for the provision of public fixed capital.

This paper supports the use of a tariff and taxes abatement programme to encourage the private sector to supply the public fixed capital. The programme is not too dissimilar to the well established businesses and retention programmes that many municipalities have launched over the past 10 years. Therefore the abatement programme is an adaptation of an existing programme that is used to facilitate business establishment and retention.

Tariff and taxes abatement programmes are also fairly common internationally and are being used for many different reasons. In this particular case the argument is that it can and should be used to facilitate and encourage public and private fixed capital formation.

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