

# Costing of Municipal Services to Inform DORA Allocations



FINANCIAL  
AND FISCAL  
COMMISSION



SOUTH AFRICAN LOCAL  
GOVERNMENT ASSOCIATION

**SALGA**

*Inspiring service delivery*

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## Glossary

### **Asset**

A resource owned or controlled by an entity as a result of past events and from which future economic benefits or service potential are expected to flow to the entity.

### **Capital (financial concept of)**

Net assets of an entity.

### **Capital (physical concept thereof)**

The productive capacity of an entity as measured in optimised depreciated replacement cost.

### **Capital expenditure**

Expenditure used to create new assets, increase the capacity of existing assets beyond their original design capacity or service potential, or to return the service potential of the asset or expected useful life of the asset to that which it had originally. CAPEX increases the value of capital asset stock.

### **Capital upgrading**

Enhances the service potential of the asset or the economic benefits that can be obtained from use of the asset and may also increase the life of the asset beyond that initially expected.

### **Condition**

The physical state of the asset.

### **Condition assessment or condition monitoring (IIMM)**

The inspection, assessment, measurement and interpretation of the resultant data, to indicate the condition of a specific component so as to determine the need for some preventive or remedial action.

### **Corrective maintenance**

Maintenance carried out after a failure has occurred and intended to restore an item to a state in which it can perform its required function. Corrective maintenance can be planned or unplanned.

### **Current replacement cost**

The cost the entity would incur to acquire the asset on the reporting date. The cost is measured by reference to the lowest cost at which the gross future economic benefits could be obtained in the normal course of business, or the minimum it would cost to replace the existing asset with a new modern equivalent asset with the same economic benefits allowing for any differences in the quantity and quality of output and in operating costs.

### **Deferred Maintenance**

The portion of planned maintenance work necessary to maintain the service potential of an asset that has not been undertaken in the period in which such work was scheduled to be undertaken.

### **Demand management**

The active intervention in the market to influence demand for services and assets with forecast consequences, usually to avoid or defer CAPEX expenditure. Demand management is based on the notion that as needs are satisfied expectations rise automatically and almost every action taken to satisfy demand will stimulate further demand.

**Density**

Measurement of the population of a defined geographic urban area, excluding non-urban land-uses. Non-urban uses include regional open space, agriculture and water-bodies. Density can be measured using any of the following means, depending on the purpose of the measurement:

- **Floor area ratio (FAR)** - the total floor area of buildings divided by land area of the lot they are built on
- **Residential density** - the number of dwelling units in a given area
- **Population density** - the number of people in a given area
- **Employment density** - the number of jobs in a given area
- **Gross density** - any density figure for a given area of land that includes uses not necessarily directly relevant to the figure (normally roads, typically accounting for about 20% the land cover of a settlement)
- **Net density** - a density figure for a given area of land that excludes land not directly related to the figure.

For purposes of this report reference to "density" means population density.

**Depreciated replacement cost**

The replacement cost of an asset less accumulated depreciation calculated on the basis of such cost to reflect the already consumed or expired economic benefits of the asset.

**Depreciation**

Depreciation is the systematic allocation of the depreciable amount of an asset over its useful life.

**Disposal**

Actions necessary to decommission and dispose of assets that are no longer required.

**Economic life**

The period from the acquisition of the asset to the time when the asset, while physically able to provide a service, ceases to be the lowest cost alternative to satisfy a particular level of service. The economic life is at the maximum when equal to the physical life, however obsolescence will often ensure that the economic life is less than the physical life.

**Facility**

A complex comprising many assets (e.g. a water treatment plant) which represents a single management unit for financial, operational, maintenance or other purposes.

**Incident**

Unplanned event or occurrence resulting in damage or other loss.

**Life**

A measure of the anticipated life of an asset or component, such as time, number of cycles, distance intervals etc.

**Financing costs**

Includes annual interest costs and capital repayments (principle amount) for the investment over the period of the loan.

**Greenfields development**

Development that is unconstrained by existing fixed structures.

**Impairment loss**

An impairment loss of a cash-generating asset is the amount by which the carrying amount of an asset exceeds its recoverable amount.



**Infrastructure assets**

Stationary systems forming a network and serving whole communities, where the system as a whole is intended to be maintained indefinitely at a particular level of service potential by the continuing replacement and refurbishment of its components.

**Inventories**

Inventories are assets: (a) in the form of materials or supplies to be consumed in the production process; (b) in the form of materials or supplies to be consumed or distributed in the rendering of services; (c) held for sale or distribution in the ordinary course of operations; or (d) in the process of production for sale or distribution.

**Investment costs**

The initial capital investment plus any intermittent capital expenditure required to achieve the project outcomes.

**Level of service**

Levels of service statements describe the outputs or objectives an entity intends to deliver to customers.

**Lifecycle**

The time interval that commences with the identification of the need for an asset and terminates with the decommissioning of the asset or any liabilities thereafter.

**Lifecycle cost**

The total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, renewal and disposal costs.

**Maintenance**

All actions intended to ensure that an asset performs a required function to a specific performance standard(s) over its expected useful life by keeping it in as near as practicable to its original condition, including regular recurring activities to keep the asset operating, but specifically excluding renewal.

*Note: Maintenance also specifically excludes restoring the condition or performance of an asset following a recognised impairment event, which would be classified as either renewal or upgrading, depending on the circumstances.*

**Maintenance of capital**

Expenditure to ensure that the productive or operating capacity of the asset base is maintained over time. The value vested in capital assets is maintained when the entity has at least as much capital at the end of the period as it had at the beginning thereof.

**Maintenance expenditure**

Recurrent expenditure as required to ensure that the asset achieves its intended useful life. Maintenance is funded through the entity's operating budget, and such expenditure is expensed in the entity's Statement of Financial Performance.

**Maintenance objectives**

Objectives for what maintenance has to achieve to ensure the assets are in the right condition to meet the needs of the entity. Maintenance performance measures and targets are the means of assessing whether the maintenance objectives are being met.



**Maintenance standards**

The standards set for the maintenance service, usually contained in preventive maintenance schedules, operation and maintenance manuals, codes of practice, estimating criteria, statutory regulations and mandatory requirements, in accordance with maintenance quality objectives.

**Material**

Omissions or misstatements of items are material if they could, individually or collectively, influence the decisions or assessments of users made on the basis of the financial statements. Materiality depends on the nature or size of the omission or misstatement judged in the surrounding circumstances. The size of the information item, or a combination of both, could be the determining factor.

**Modern equivalent asset**

The most cost-efficient asset currently available that will provide equivalent functionality to the asset that will be replaced (or are currently being valued using the DRC methodology).

**Monitoring**

Determining the status of a system, a process or an activity.

**Objective**

Result to be achieved at strategic, tactical or operational level. Objectives can be set in a variety of domains or outcome areas (e.g. economic, social or environmental outcomes), or can relate to elements of the entity (e.g. corporate level or units in the entity), or can relate to processes, services, products, programmes and projects.

**Obsolescence**

The asset can no longer be maintained, or suffers a loss in value due to a decrease in the usefulness of the asset, caused by technological change, or changes in people's behavioural patterns or tastes, or environmental changes.

**Performance**

Measurable result of either quantitative or qualitative nature that can relate to the management of activities, processes, products or services, systems or entities.

**Policy**

Intentions and direction of an entity as formally expressed in a documented statement approved by top management and communicated throughout the entity.

**Predictive action**

Action to monitor the condition of an asset and predict the need for preventative or corrective action. Also referred to condition monitoring or performance monitoring.

**Preventative maintenance**

Maintenance carried out at pre-determined intervals, or corresponding to prescribed criteria, and intended to reduce the probability of failure or the performance degradation of an item. Preventative maintenance is planned or carried out on opportunity.

**Property, plant and equipment (PPE)**

Property, plant and equipment are tangible items that: (a) are held for use in the production or supply of goods or services, for rental to others, or for administrative purposes; and (b) are expected to be used during more than one reporting period.

**Remaining useful life**

The time remaining until an asset ceases to provide the required service level or economic usefulness.

**Renewal**

Expenditure on an existing asset which returns the service potential of the asset or expected useful life of the asset to that which it had originally.

*Note 1: Renewal can include works to replace existing assets or facilities with assets or facilities of equivalent capacity or performance capability.*

*Note 2: Expenditure on renewals is funded through the entity's capital budget, and such expenditure is recognised in the entity's Statement of Financial Position.*

**Risk**

The effect of uncertainty on objectives. Risk events are events which may compromise the delivery of the entity's strategic objectives.

**Risk exposure**

The level of risk to which an entity is exposed to. Risk exposure is a function of the probability of an occurrence times the impact of that occurrence.

**Routine maintenance**

Day to day operational activities to keep the asset operating (replacement of light bulbs, cleaning of drains, repairing leaks, etc.) and which form part of the annual operating budget, including preventative and periodic maintenance.

**Statement of Financial Performance**

The Statement of Financial Performance, also known as an income statement, shows the revenue and expenses of an entity over a period of time.

**Statement of Financial Position**

The Statement of Financial Position, also known as the Balance Sheet, presents the financial position of an entity at a given date. The statement comprises three main components, these being assets, liabilities and equity, and gives users of financial statements insight into the financial soundness of an entity in terms of liquidity risk, financial risk, credit risk and business risk.

**Unplanned maintenance**

Corrective work required in the short term to restore an asset to working condition so that it can continue to deliver the required service or to maintain its level of security and integrity.

**Useful life**

The useful life of an asset is the period over which an asset is expected to be available for use by an entity or the number of production or similar units expected to be obtained from the asset by an entity.

## Acronyms

<b>ARC</b>	<b>Agricultural Research Council</b>
CAPEX	Capital Expenditure
<b>CPIX</b>	<b>Consumer Price Index</b>
CRC	Current Replacement Cost
<b>DORA</b>	<b>Division of Revenue Act</b>
DRC	Depreciated Replacement Cost
<b>DWAS</b>	<b>Department of Water and Sanitation</b>
FFC	Financial and Fiscal Commission
<b>GAPD</b>	<b>General Administration, Planning and Development</b>
GRAP	Generally Recognised Accounting Practice
<b>HV</b>	<b>High Voltage</b>
IAS	International Accounting Standards
<b>INEP</b>	<b>International Infrastructure Management Manual</b>
IT	Information Technology
<b>LES</b>	<b>Local Government Equitable Share</b>
LV	Low Voltage
<b>MIG</b>	<b>Municipal Infrastructure Grant</b>
MTREF	Medium Term Revenue and Expenditure Framework
<b>MV</b>	<b>Medium Voltage</b>
MWIG	Municipal Water Infrastructure Grant
<b>NERSA</b>	<b>National Electricity Regulator South Africa</b>
PPE	Property, Plant and Equipment
<b>RBIG</b>	<b>Regional Bulk Infrastructure Grant</b>
RCM	Reliability-Centered Maintenance
<b>RHIG</b>	<b>Rural Housing Infrastructure Grant</b>
RUL	Remaining Useful Life
<b>SALGA</b>	<b>South African Local Government Association</b>
SAFCEC	South African Federation of Civil Engineering Contractors
<b>STATS SA</b>	<b>Statistics South Africa</b>
USDG	Urban Settlements Development Grant
<b>UIF</b>	<b>Unemployment Insurance Fund</b>

## Units of Measurement

hh	Household
kg	Kilogram
kℓ	Kiloliter (1 000 liters)
km	Kilometer (1 000 meters)
km <sup>2</sup>	Square kilometer
kWh	Kilowatt hours

## Executive Summary

Will be developed for final report submitted in May 2015.

# 1. Purpose



## 1.1 Scope and objectives of this report

This report provides estimates of the costs of municipal services, the aim of which is to inform the allocation of capital grants for infrastructure and other municipal facilities, and equitable share allocations to municipalities to fund the operating costs of service provision. The scope of services for which costs are provided include, in this edition of the report (editions are linked to FFC research cycles), the following:

**Table 3: Report editions and scope of municipal services**

Report edition	Scope of municipal services	
	Operating costs	Capital costs
2014/15 Edition	<ul style="list-style-type: none"> <li>• Municipal roads and stormwater</li> <li>• Municipal administration</li> <li>• Municipal health services</li> </ul>	<ul style="list-style-type: none"> <li>• Municipal roads and stormwater</li> <li>• Sanitation</li> <li>• Refuse removal</li> <li>• Electricity</li> </ul>
2015/16 Edition	<ul style="list-style-type: none"> <li>• Fire-fighting services</li> </ul>	<ul style="list-style-type: none"> <li>• Municipal administration</li> <li>• Municipal health services</li> <li>• Fire-fighting services</li> </ul>

## 1.2 Background

The FFC in the 2013/14 financial year formed part of a team that reviewed and implemented the new Local Government Equitable Share (LES) formula. During the process it became clear that there is very little information or research on the costs of providing basic municipal services. Much of the limited body of data is outdated, municipal financial reporting does not fully support services' cost analysis, and there are significant differences in the costs of delivering basic services as a result of economies of scale in operation, spatial patterns, local influencing factors such as topography etc.

The FFC in 2013/14 undertook research and the development of a fully functioning, flexible costing model to assist in allocating grants to municipalities. To this end the FFC appointed i @ Consulting (Pty) Ltd develop the costing methodology, assemble a database of estimated municipal costs, data that influences costs (e.g. population, topography

and number of settlements), and to construct an Excel-based model to calculate basic service costs. Due to funding constraints, work on the model in the first phase focussed on estimating the operating costs of water, sanitation and refuse removal only. Key model features include:

1. Comprehensive municipal-specific profiling (e.g. nr of households in a particular municipality located on mountainous terrain).
2. The costs of municipal basic services can be moderated individually, per category or in total, based on exogenous cost-influencing factors such as spatial characteristics, topography and geology.
3. Ability to establish the cost of municipal services based on actual costs, benchmarked costs, average costs or some combination of these
4. The model allows for temporal adjustments to variable base datasets (e.g. population size and nr of households).
5. The model discourages municipal inefficiencies through the establishment of loss-limiting factors through a combination of quantification of demand based on national policy allowance and the setting of limits for unaccounted water and electricity.
6. The production of a proposed 3-year DORA allocation schedule and additional reporting capability.
7. Reporting capability in both tabular and graphical formats.
8. Scenario analysis for, amongst other, policy analysis purposes. This includes, amongst other:
  - a) Varying levels of consumption-based demand for infrastructure services, and the impacts thereof on operations and maintenance costs;
  - b) Different levels of investment in infrastructure investment, and the impacts on operations and maintenance costs; and
  - c) Different approaches to infrastructure investment, and the impacts on operations and maintenance, as follows:
    - **Model A: Asset sweating** – continuation of current investment approach: investment in new asset creation and neglect of current infrastructure
    - **Model B: Responsible asset custodianship and investment aligned to growth** – investment in new assets linked to population growth, and adequate provision for infrastructure renewal

The approach in 2014 was focused to a larger extent on modelling the infrastructure status and cost of services for the indicated services (water, sanitation, solid waste, as well as electricity) to all households per municipality, and the cost of services to low income households derived from the results. In the current model the cost of services rendered to the poor and the capital needs for providing services to low income households (both infrastructure to serve the growth in households, and the cost for eradicating access backlogs) have been included, and the emphasis across the spectrum is now focused on low income households, and the services include roads and stormwater, with basic information for fire stations and operational buildings also provided.

The FFC and SALGA have since partnered to scope and finance phases 2 and 3 to expand the model to estimate both the capital and operating costs of all municipal basic services.

### 1.3 How to read this report

Section 2 of this report explains the approach and methodology to determining both the capital and operating costs of municipal infrastructure. General elements of both capital and operating costs are described. Municipal service costs are highly place-specific, and are influenced by factors such as topography, soil conditions and distances from major economic centers. These spatial factors affect both construction costs (capital costs) and the cost of operations. This report recognises the impact of spatial characteristics, and documents the approach and methodology followed in developing spatially nuanced costs.



The base year adopted for the modelled results reported is 2014. This report, and the electronic cost model that generates municipal services cost estimates, ultimately aim to inform allocations in the Division of Revenue Act (DORA) that has a rolling three-year window. This requires updating of both population and cost estimates. Section 2 explains the indices used to update various projections, as well as the specific indices to which specific elements of costs are linked to. Sections 3 – 6 detail the capital cost estimates per municipal services, and Sections 7 – 9 provide operating cost estimates for selected municipal services, including the costs of municipal administrative services.

Population and household numbers, and growth have been based on the census 2011 data, updated with the results of the 2013 household survey, as adopted and published by Treasury, and used in the determination of the current Local Government Equitable Share allocation. It was assumed that the growth for the period following 2017/18 would be the same as for the 2017/18 year.

## 2. About Cost Estimation

### 2.1 Classification of costs

Municipal costs are classified as either capital expenditure or operating expenditure. Capital expenditure (CAPEX) is expenditure used to create new assets, increase the capacity of existing assets beyond their original design capacity or service potential, or to return the service potential of the asset or expected useful life of the asset to that which it had originally. Capital created, enhanced or renewed bolsters the productive capacity of a municipality, and it is for this reason that CAPEX is reported on in a municipality's Statement of Financial Position. Expenses incurred in the daily operation or ongoing operation of a municipality is referred to as Operating Expenditure (OPEX) and are reported on in the Statement of Financial Performance.

### 2.2 Capital costs

Capital cost estimates have been determined per service (e.g. sanitation) per household based on average current replacement costs per household as determined for some 12% of municipalities (32 municipalities). For the estimation of capital costs during the cost establishment process. These municipalities are listed in **Table 2**. In most instances asset valuation has been done for purposes of asset register preparation, and in most cases unqualified audit results were recorded. The dataset therefore displays the qualities of a consistent approach aligned with accounting standards, and quality assured results. The constituent elements included in capital costs used in determining current replacement cost are as defined in the Generally Recognised Accounting Practice Standard 17 on Property, Plant and Equipment (GRAP 17). GRAP 17 defines the elements of the capital cost of assets as follows (March 2012: 11-12):

- a. Purchase price, inclusive of import duties and non-refundable purchase taxes after deduction of trade discounts and rebates.
- b. Any costs attributable to delivering the asset to the location and condition necessary for it to be able to operate in the manner intended by management. Examples of directly attributable costs are:
  - costs of employee benefits arising directly from construction or acquisition of the item;
  - costs to prepare the site;
  - initial delivery and handling costs;
  - installation and assembly costs;
  - cost of testing that the asset is functioning as per specification; and
  - professional and general fees.
- c. The initial estimate of costs to dismantle and remove the structure or item, and to restore the site on which it is located.

Cost estimates informing the asset valuations of the municipalities noted in this report were in turn based upon COGTA's "Municipal Infrastructure: An Industry Guide to Infrastructure Service Delivery Levels and Unit Costs – June 2010" as well as of cost records of infrastructure acquisition or construction projects in these municipalities.

As noted, the unit of cost is average current replacement cost per service per household. The emphasis here is on "average". Section 2.3 notes cost-influencing factors, which can lead to significant variances in site-specific costs. Seen at the aggregate scale, there is very little value in conducting a detailed cost analysis of only a few municipalities, and to extrapolate to national scale, as costs can vary significantly in a municipality, between municipalities, and between provinces. There are a number of reasons for this, in addition to the factors listed in the following section. These include, to mention but a few, the type of technology employed, the configuration of infrastructure systems and the levels of service offered – in all these cases, there is little firm comparative data available.

**Table 4: Municipal asset valuations informing asset values and capital cost estimates**

Municipality	Province	Roads & stormwater	Water	Sanitation	Refuse removal	Electricity	Municipal administration	Health services	Fire-fighting
Buffalo City	EC	•	•	•	•	•	•	•	•
Ekurhuleni	GAU	•	•	•	•	•	•	•	•
Johannesburg	GAU		•	•					
Tshwane	GAU		•	•					
Emfuleni	GAU	•	•	•	•	•	•	•	
Govan Mbeki	MPU	•	•	•	•	•	•	•	
Lephalale	LIM		•	•					
Mogale City	GAU	•	•	•	•	•	•	•	•
Msunduzi	KZN	•							
Polokwane	LIM	•	•	•	•	•	•	•	•
Steve Tshwete	MPU	•	•	•	•	•	•	•	•
Abaqulusi	KZN								
Albert Luthuli	MPU	•	•	•	•	•	•	•	
Bela-Bela	LIM	•	•	•	•	•	•	•	
Dipaleseng	MPU	•	•	•	•	•	•	•	
Dr JS Moroka	MPU	•					•		
Elias Motsoaledi	LIM	•	•	•	•	•	•	•	
Merafong	GAU	•	•	•		•	•		
Mkondo	MPU	•	•	•	•	•	•	•	
Modimole	LIM		•	•					
Mohokare	FS	•	•	•	•	•	•	•	
Mookgophong	LIM	•	•	•	•	•	•	•	
Msukaligwa	MPU		•	•					
Naledi	FS	•	•	•		•	•		
Pixley-ka-Seme	MPU		•	•					
Randfontein	GAU	•	•	•			•		
Thembisile Hani	MPU	•	•	•		•			
Victor Khanye	MPU	•	•	•	•	•	•	•	
Westonaria	GAU	•	•	•		•	•		
Greater Sekhukhune	LIM	•	•	•			•	•	•
Ugu	KZN		•	•					
West Rand	GAU							•	



Metropolitan municipality  
Other local municipality



Secondary city (local municipality)  
District municipality

It is, for example, often assumed that municipalities in rural settings offer basic levels of service for water, and that water is obtained from either boreholes or from rivers where water is purified through chemical dosing and/or sand filtration. But in the case of the Sekhukhune District in Limpopo, for example, the nutrient composition of water is not optimal, local water availability is not always assured, and the cost of basic systems often excessive. So dual systems are in some cases in use (combining local source abstraction and treatment with piped water conveyed from elsewhere), and there has been a move toward regional water scheme consolidation. Safety considerations also often necessitate

the installation of higher levels of service in dense urban settings. Capital cost of infrastructure was determined after exploring alternative methods to independently calculate the replacement cost of infrastructure assets required to service customers at specific LOS (levels of service). The results were compared and calibrated against actual values for municipalities where the extent and value of assets were known and could be used as benchmarks. The alternatives explored included:

- a. Developing current all-inclusive replacement values for infrastructure assets per service based on comprehensive component level immovable asset registers that **i @ Consulting (Pty) Ltd** established for more than 40 municipalities of different sizes, from different provinces, and with varying levels of efficiency over the past decade. Based on the extensive information available, CRC values per household were determined for typical infrastructure replacement costs for all infrastructure services.
- b. Detailed benchmark infrastructure extent and costs per household were determined from asset registers for a smaller sample of municipalities. The unit costs determined were used to calculate CRC values per municipality and were compared to the CRC values derived above to test the validity of the initial calculations. An example of comparative testing done is shown in **Appendix A**. The results indicate that the overall infrastructure costs for water per customer in the rural area did not differ significantly from the overall costs in urban areas in this instance. Bulk water infrastructure was significantly higher in one of the urban areas (Zone 2). The cost for water treatment facilities was relatively low, as a large proportion of bulk water is purchased from bulk suppliers. The overall cost for sanitation infrastructure is much lower in the rural area because the majority of customers do not have waterborne services. The cost for outfall sewers per customer was once again higher in Zone 2, as was the case for water bulk mains. These municipalities included:
  - Bela-Bela LM
  - City of Tshwane
  - Dipaleseng LM
  - Dr JS Moroka LM
  - Ekurhuleni Metro
  - Joburg Water
  - Mogale City LM
  - Randfontein LM
  - Steve Tshwete LM
  - Thembisile Hani LM
  - Westonaria LM
- c. Additional analysis of infrastructure cost was done, for which the 'MIG guidelines' were used (published as 'An Industry Guide to Infrastructure Service Delivery Levels and Unit Costs- 2010 (Final)'). The guidelines were the result of a collaborative effort involving all affected government departments (e.g. CoGTA, National Treasury, DWS, expert private sector consultants, CSIR, CIDB and DBSA)

**Appendix B** indicates the result of comparisons done between asset CRC values derived, and extracts from the 'MIG Guidelines' as well as Buffalo City. In general the asset CRC values derived from benchmarking were lower than the guideline values. The reason for this is in part the difference in approach used (the benchmarking based on actual service delivery areas with some mixed levels of service, and the guidelines on homogenous service levels). The table below indicates the various estimations for asset infrastructure costs for water and sanitation services.

**Table 3: Cost comparison for water and sanitation infrastructure**

Source	Water R/hh	Sanitation R/hh	Comment
Benchmark	16 059	18 405	Metro/ Secondary cities
Benchmark	18 155	15 367	Other (than Metro/ Secondary cities - and B4 for sanitation)
Benchmark	NA	9061	B4 (Rural municipalities)
MIG	28 359	28 024	50 000 people (based on scheme size)
MIG	29 501	32 733	20 000 people
Buffalo City MM	18 038	15 880	Average urban cost/hh
Buffalo City MM	14 974	10 245	Average rural cost/hh

The benchmark values have been adopted and used for the current model.

## 2.3 Operating costs

Operating costs are all recurrent costs incurrent to deliver services to customers, as well as general administration and planning costs. The following cost structure was adopted for operating expenditure for each of the infrastructure services modelled:

- a. Bulk purchases
- b. Contracted services
- c. Employee-related costs – salaries & wages
- d. Insurance
- e. Other expenditure – Loose tools & overheads
- f. Other materials
- g. Rent of facilities and equipment
- h. Operations / Repairs and maintenance
- i. Transportation costs
- j. Energy costs

These are briefly described below:

### 2.3.1 Bulk purchases

These are the costs incurred to buy bulk water from external providers, either from the Department of Water and Sanitation (DWAS) or from a water board, as well as the costs of purchasing bulk electricity, typically from Eskom.

### 2.3.2 Contracted services

These are services provided by external contractors on either a spot or term basis, and typically includes the following:

- a. Audit forensic
- b. Banking services: security company
- c. Cleaning services
- d. Connections via contractor
- e. Consultant fees
- f. Contracted services
- g. Lease agreements
- h. Management: landfill site
- i. Rental: earthmoving equipment
- j. Security services
- k. System support

- l. Third party collections commission

### **2.3.3 Employee related costs – salaries & wages**

This category includes the following elements of cost:

- a. Acting allowance
- b. Basic salaries
- c. Casualty contribution
- d. Group insurance
- e. Housing subsidy
- f. Industrial council levy
- g. Industrial council levy
- h. Labour - building workshop
- i. Labour - roads workshop
- j. Leave bonus
- k. Medical fund
- l. Overtime
- m. Pension contributions
- n. Redemption of leave
- o. Skills development levy
- p. Standby allowance
- q. Telephone allowance
- r. Transport allowance
- s. U.I.F
- t. Uniforms

### **2.3.4 Insurance**

This category includes insurance premiums and excess payments related to asset, service delivery, public liability and other third party-related risks.

### **2.3.5 Other expenditure – loose tools & overheads**

Typical items included in this category are:

- a. Catering
- b. Departmental electricity - Eskom
- c. Equipment
- d. Loose tools
- e. Marketing/promotion/advertisements

### **2.3.6 Other materials**

Other materials typically include the following:

- a. Stationery/printing/binding etc
- b. Stock and materials
- c. Periodicals/reference book/magazines
- d. Purchase & distribution of 240 litre bins

### 2.3.7 Rent of facilities and equipment

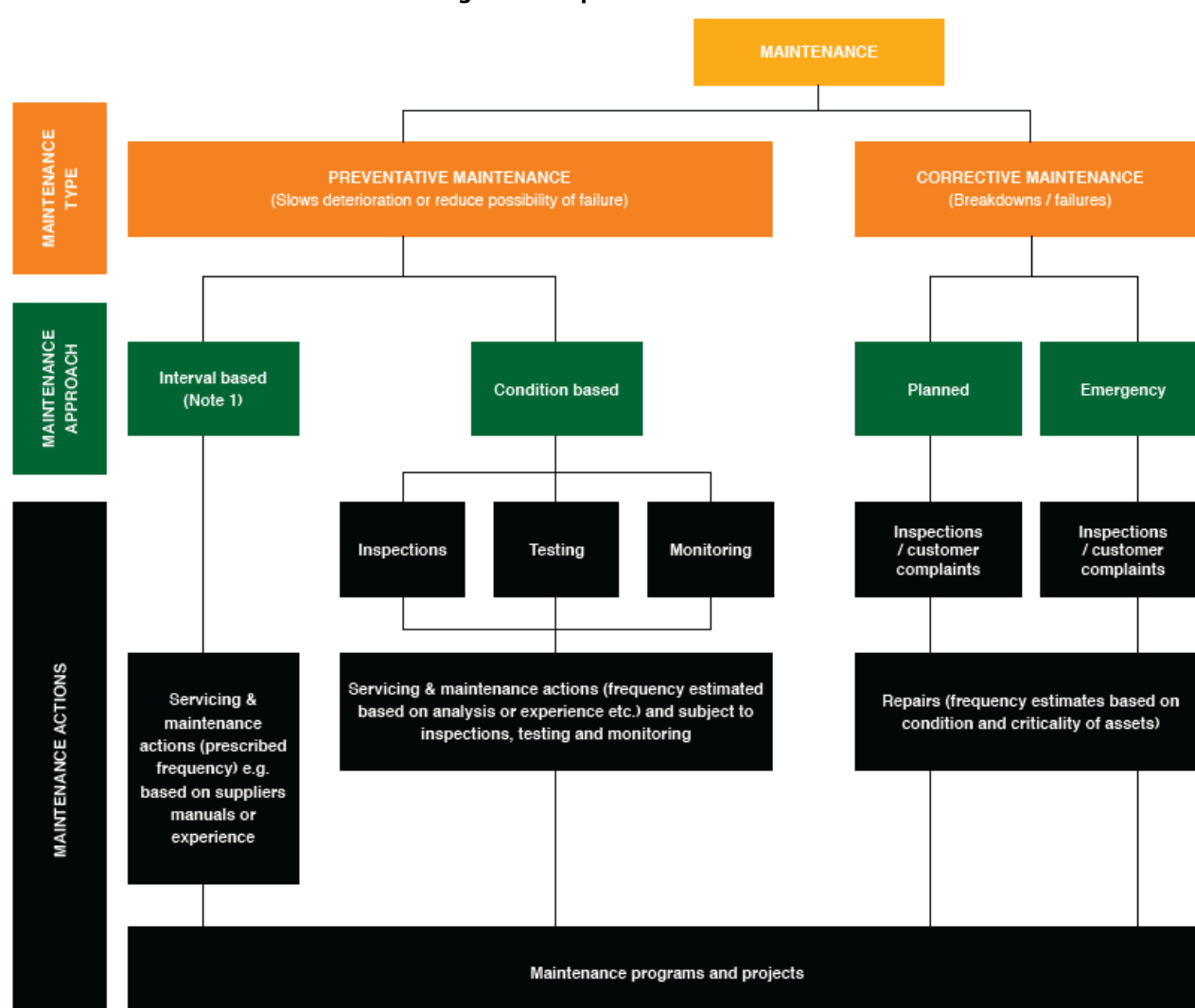
This category includes rental or lease of office space or operational facility space such as stores, workshop or yards, as well as of office equipment, IT equipment and other equipment used in service delivery, such as honeysuckles.

- a. Hire of equipment
- b. Lease of IT equipment
- c. Lease: office equipment
- d. Rental: office space
- e. Rental: toilets

### 2.3.8 Repairs and maintenance

Repairs and maintenance include all actions intended to ensure that an asset performs a required function to a specific performance standard(s) over its expected useful life by keeping it in as near as practicable to its original condition, including regular recurring activities to keep the asset operating, but specifically excluding renewal.

**Figure 1: Scope of maintenance**





### 2.3.9 Transportation costs

This category of cost includes the following items:

- a. License fees: Vehicles
- b. Mechanical repairs on vehicles
- c. Oil & fuel
- d. Rental of earthmoving equipment
- e. Transport (fleet)
- f. Tyres
- g. Vehicle leases

## 2.4 Municipal differentiation

For purposes of profiling and cost estimation municipalities have been classified as follows:

**Table 4: Municipal classification**

Class		Characteristics
A	Metros	Category A municipalities
B1	Secondary cities	All local municipalities referred to as secondary cities
B2	Large towns	All local municipalities with an urban core. There is huge variation in population sizes amongst these municipalities and they have a large urban dwelling population
B3	Small towns	Characterised by the lack of a large town as a core urban settlement. They tend to have a relatively small population, a significant portion of which is urban and based in one or more towns. Rural areas are characterised by commercial farms and the local economies are largely agriculturally based
B4	Mostly rural	Characterised by the presence of at most one or two small towns, communal land tenure and villages or scattered groups of dwellings typically located in former homelands
C1	Districts	District municipalities that are not water services providers
C2	Districts	District municipalities that are water services providers

## 2.5 Cost influencing factors

A number of factors can significantly influence the cost of infrastructure development (CAPEX) as well as of service delivery (OPEX). The following key factors were selected to moderate projected CAPEX and OPEX needs:

- a. Topography (flat, rolling or mountainous terrain) – this dataset was obtained from the Agricultural Research Council (ARC), 25 November 2013;
- b. Location (coastal or inland);
- c. Distance from economic centers;
- d. Development status referring to number of settlements and densities; and
- e. Loss of economy of scale

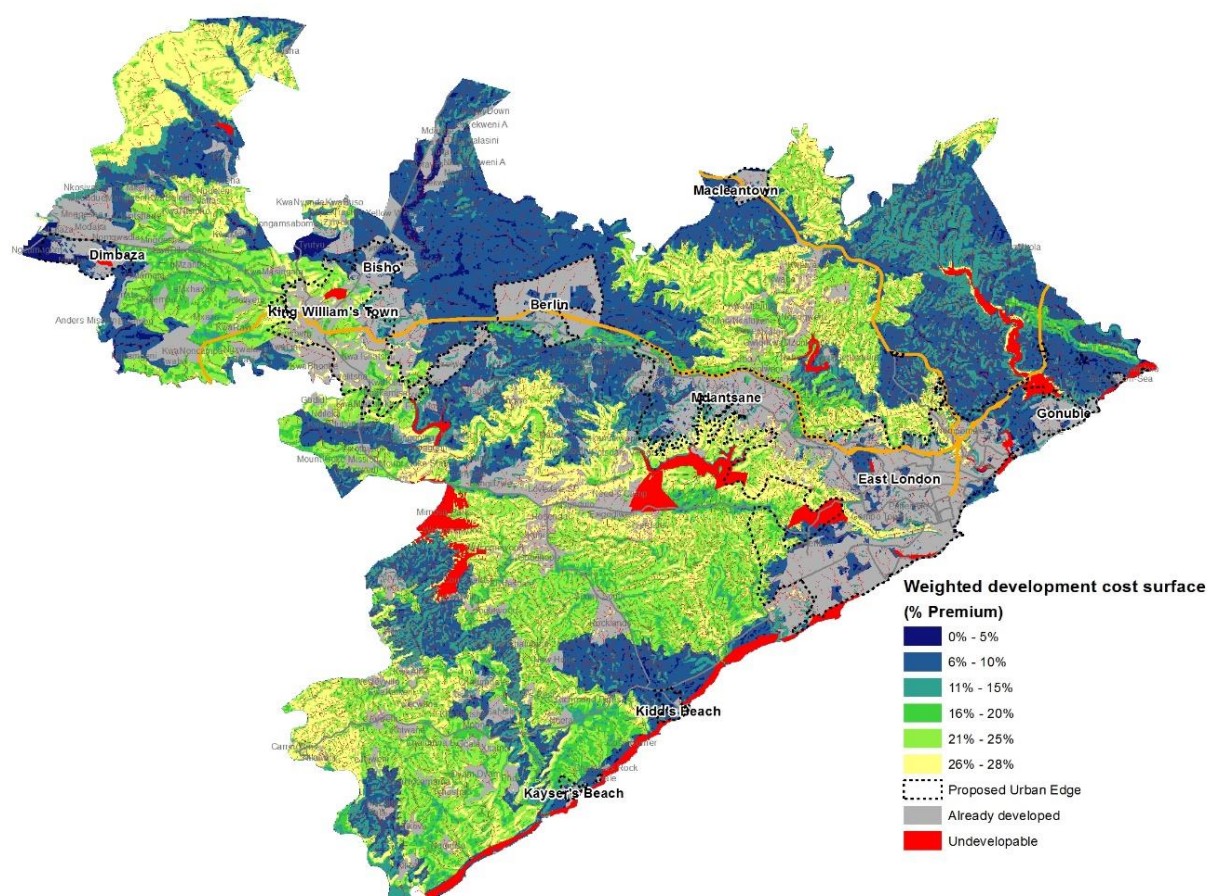
These factors have been selected since credible and consistent national data is available for all municipalities. As noted in Section 2.2, there are other cost influencing factors, such as the type of technology and configuration of infrastructure, that also affect municipal service costs. However, as data is limited, in many cases outdated and generally not prepared in a consistent format, these have not been factored for in cost estimates. A further set of factors not considered is soil type and condition, such as unstable soils which would add a construction premium – these were excluded as more specific knowledge would be needed as to the proposed siting of development, and because, all things being equal, feasibility assessments would point against development on such sites. A geo-spatial profile was developed for all municipalities in South Africa which includes all cost-influencing factors listed in a – e above, and also for geology, though geology has not been taken into consideration for moderation of costs for the reasons noted above. The geological profile includes the occurrence of collapsing soils, dolomite, expansive clays and restricted soil depth per municipal area.

In future years it may become necessary to add geo-technical factors to the list of cost-influencing factors as the trend of urbanisation continues, cities become more dense and greenfields land availability in city spaces become more limited. The cost influencing factors considered in cost estimates include:

### 2.5.1 Topography

Topography can be an important consideration in both capital and operating costs. Water and sanitation networks, for example, would under ideal conditions be designed to enable conveyance (water and sewerage) through gravity. In rolling and mountainous terrain it becomes necessary to construct pump stations to boost flow in these systems, which adds to the cost of construction (CAPEX). The pump stations consume energy, which adds to energy costs under operating expenditure. Following is an example of how topography and geology affect the capital cost of development in Buffalo City:

**Figure 2: Application of capital development cost premiums to Buffalo City**

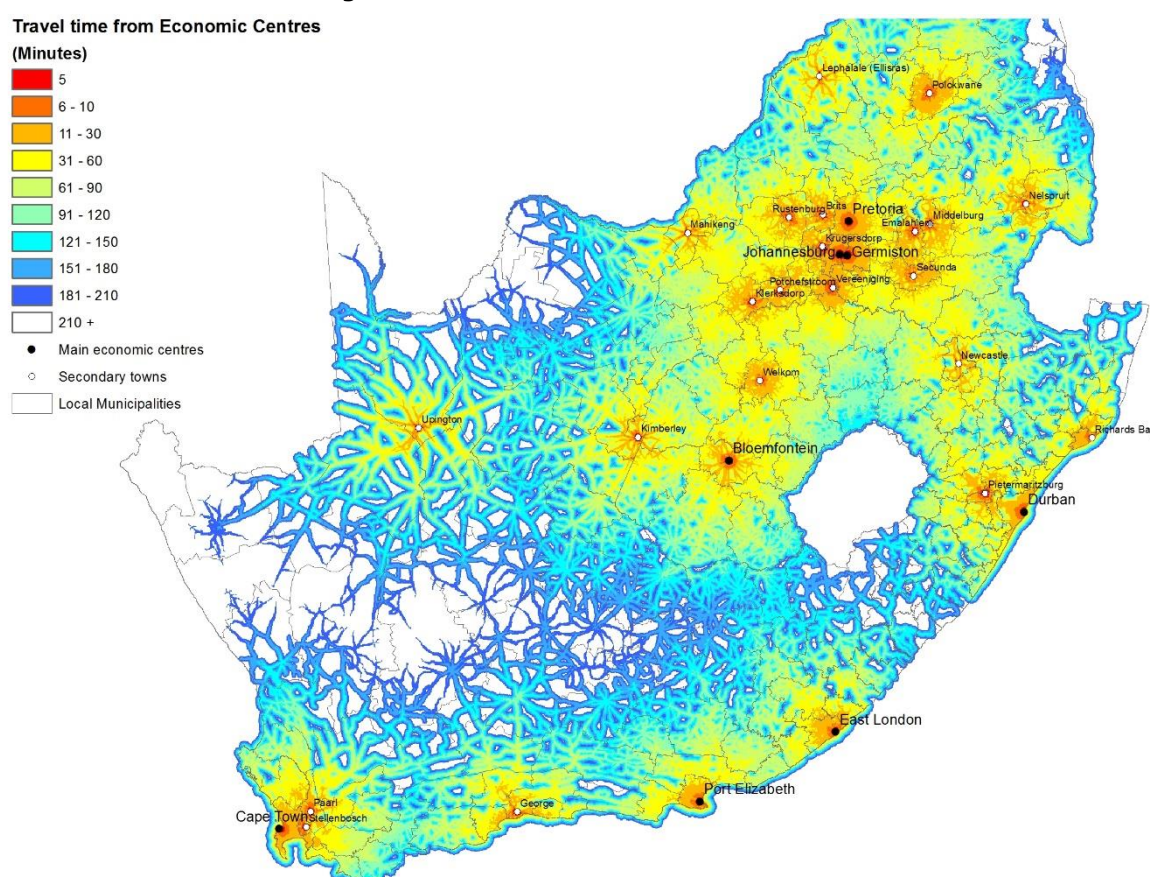


### 2.5.2 Location

For purposes of the costing model, location differentiates between coastal and inland. In inland settings, for example, all sewerage must be treated for safe discharge into natural water systems. This requires the construction and operation of wastewater treatment works. In coastal settings biological sewerage is routinely discharged into oceans, or receive rudimentary treatment only before being discharged into oceans, where the volume of water coupled with the salt content is generally sufficient to treat wastewater.

### 2.5.3 Distance from economic centers

Specialised goods and services tend to be concentrated in larger economic centers. This is generally true for professional services such as town planning and engineering consulting services, for the suppliers and distributors of specialised capital equipment and spares, and for consumables such as chemicals. Municipalities situated some distance away from main economic centers pay a premium to acquire specialised goods and services in the form of increased delivery costs for goods, and travel disbursements for specialised services.

**Figure 3: Travel times from main economic centers**

### 2.5.4 Development status

The size of the municipal area, number of settlements, whether households are located in urban or rural settings, and density all affect both capital and operating cost structures.

Density deserves special mention. The densification objective is currently high on the South African urban agenda, and is specifically noted in the National Development Plan, the Integrated Urban Development Framework and in the Urban Networks Strategy. It is widely assumed that infrastructure can be provided more cost efficiently to dense or compact spatial forms. This is however not necessary true in all places and instances. The UN Habitat (2009: 160) notes that research on this topic highlights that the relationship between cost efficiency and compact form is much more complex, and that study of actual development indicates highly variable unit costs between types of infrastructure, topography, geotechnical conditions, available capacity and service thresholds. The following datasets have been incorporated in the geo-spatial profile of the cost estimation model:

**Table 5: Development status factors**

Category	Element	Data source	Data timestamp
Settlement typology	Size of municipal area (km <sup>2</sup> )	Municipal Demarcation Board	Nov-2011
	Nr of settlements	StatsSA - number of Sub Places per Municipality	2011
	Size of largest settlement (nr of hhs)	StatsSA - Sub Place with the largest number of Households per municipality	2011
	Population density (hhs/km <sup>2</sup> )	Population (StatsSA 2011) / Size of Municipal Area	25-Nov-2013
Level of urbanisation	HHS in urban areas	StatsSA - Geo Type	2011
	HHS in farm areas	StatsSA - Geo Type	2011
	HHS in tribal/traditional areas	StatsSA - Geo Type	2011
	% hhs urbanised	Calculated: HHS in urban areas / total hhs.	25-Nov-2013

### 2.5.5 Cost influencing factor index

The impacts of the cost-influencing factors described above on cost elements per infrastructure service are as indicated in the following index:

**Table 6: Cost influencing factor index - topography and location**

Cost influencing factor (on Operation and Maintenance) : 0% = no influence		Topography			Location	
Class	Cost element	Flat	Rolling	Mountainous	Coastal	Inland
Electricity	Bulk purchases	0%	0%	0%	0%	0%
	Contracted services	0%	2%	4%	0%	0%
	Employee-related costs – salaries & wages	0%	2%	4%	0%	0%
	Insurance	0%	0%	0%	0%	0%
	Other expenditure – Loose tools & overheads	0%	0%	0%	0%	0%
	Other materials	0%	0%	0%	0%	0%
	Rent of facilities and equipment	0%	0%	0%	0%	0%
	Operations / Repairs and maintenance	0%	0%	5%	0%	0%
	Transportation costs	0%	5%	10%	0%	0%
	Energy costs	0%	0%	2%	0%	0%
Refuse	Bulk purchases	0%	0%	0%	0%	0%
	Contracted services	0%	5%	10%	0%	0%
	Employee-related costs – salaries & wages	0%	2%	5%	0%	0%
	Insurance	0%	0%	0%	0%	0%
	Other expenditure – Loose tools & overheads	0%	0%	0%	0%	0%
	Other materials	0%	0%	0%	0%	0%
	Rent of facilities and equipment	0%	0%	0%	0%	0%
	Operations / Repairs and maintenance	0%	0%	0%	0%	0%
	Transportation costs	0%	5%	10%	0%	0%
	Energy costs	0%	0%	0%	0%	0%
Sanitation	Bulk purchases	0%	0%	0%	-2%	0%
	Contracted services	0%	0%	5%	0%	0%
	Employee-related costs – salaries & wages	0%	2%	5%	0%	0%
	Insurance	0%	0%	0%	0%	0%
	Other expenditure – Loose tools & overheads	0%	0%	0%	0%	0%
	Other materials	0%	0%	0%	0%	0%
	Rent of facilities and equipment	0%	0%	0%	0%	0%
	Operations / Repairs and maintenance	3%	2%	7%	4%	0%
	Transportation costs	0%	3%	6%	0%	0%
	Energy costs	3%	2%	0%	0%	0%
Water	Bulk purchases	0%	0%	0%	0%	0%
	Contracted services	0%	0%	5%	0%	0%
	Employee-related costs – salaries & wages	0%	2%	5%	0%	0%
	Insurance	0%	0%	0%	0%	0%
	Other expenditure – Loose tools & overheads	0%	0%	0%	0%	0%
	Other materials	0%	0%	0%	0%	0%
	Rent of facilities and equipment	0%	0%	0%	0%	0%
	Operations / Repairs and maintenance	0%	5%	10%	4%	0%
	Transportation costs	0%	3%	6%	0%	0%
	Energy costs	0%	5%	10%	0%	0%



Cost influencing factor (on Operation and Maintenance) : 0% = no influence		Topography			Location	
Class	Cost influencing factor	Flat	Rolling	Mountainous	Coastal	Inland
Roads and Stormwater	Bulk purchases	0%	0%	0%	0%	0%
	Contracted services	0%	0%	5%	0%	0%
	Employee-related costs – salaries & wages	0%	2%	5%	0%	0%
	Insurance	0%	0%	0%	0%	0%
	Other expenditure – Loose tools & overheads	0%	0%	0%	0%	0%
	Other materials	0%	0%	0%	0%	0%
	Rent of facilities and equipment	0%	0%	0%	0%	0%
	Operations / Repairs and maintenance	0%	5%	10%	4%	0%
	Transportation costs	0%	3%	6%	0%	0%
	Energy costs	0%	0%	0%	0%	0%

Note that no standard density factors have been included, as these are calculated for each municipality based on its unique spatial characteristics (e.g. nr of settlements, population distribution between urban and rural areas, and population densities).

**Table 7: Cost influencing factor index - Distance from economic center and loss of economy of scale**

Cost influencing factor (on Operation and Maintenance) : 0% = no influence		Distance from main economic center			Loss of economy of scale		
Class	Cost element	A	B1	B2-4 C1-2	A	B1-2	B3-4 C1-2
Electricity	Bulk purchases	0%	0%	0%	0%	0%	0%
	Contracted services	0%	5%	10%	0%	2%	5%
	Employee-related costs – salaries & wages	0%	0%	0%	0%	2%	5%
	Insurance	0%	0%	0%	0%	0%	0%
	Other expenditure – Loose tools & overheads	0%	5%	10%	0%	2%	5%
	Other materials	0%	5%	10%	0%	2%	5%
	Rent of facilities and equipment	0%	5%	0%	0%	2%	5%
	Operations / Repairs and maintenance	0%	5%	10%	0%	2%	5%
	Transportation costs	0%	5%	10%	0%	2%	5%
	Energy costs	0%	0%	0%	0%	0%	0%
Refuse	Bulk purchases	0%	0%	0%	0%	0%	0%
	Contracted services	0%	5%	10%	0%	2%	5%
	Employee-related costs – salaries & wages	0%	5%	0%	0%	2%	5%
	Insurance	0%	0%	0%	0%	0%	0%
	Other expenditure – Loose tools & overheads	0%	5%	10%	0%	2%	5%
	Other materials	0%	5%	10%	0%	2%	5%
	Rent of facilities and equipment	0%	5%	0%	0%	2%	5%
	Operations / Repairs and maintenance	0%	5%	10%	0%	2%	5%
	Transportation costs	0%	5%	10%	0%	2%	5%
	Energy costs	0%	2%	0%	0%	2%	5%
Sanitation	Bulk purchases	0%	5%	10%	0%	0%	0%
	Contracted services	0%	5%	10%	0%	2%	5%
	Employee-related costs – salaries & wages	0%	5%	0%	0%	2%	5%
	Insurance	0%	0%	0%	0%	0%	0%
	Other expenditure – Loose tools & overheads	0%	5%	10%	0%	2%	5%
	Other materials	0%	5%	0%	0%	2%	5%
	Rent of facilities and equipment	0%	5%	0%	0%	2%	5%
	Operations / Repairs and maintenance	0%	5%	10%	0%	2%	5%
	Transportation costs	0%	5%	10%	0%	2%	5%
	Energy costs	0%	0%	0%	0%	0%	0%

Cost influencing factor (on Operation and Maintenance) : 0% = no influence		Distance from main economic center			Loss of economy of scale		
Class	Cost element	A	B1	B2-4 C1-2	A	B1-2	B3-4 C1-2
Water	Bulk purchases	0%	0%	0%	0%	0%	0%
	Contracted services	0%	5%	10%	0%	2%	5%
	Employee-related costs – salaries & wages	0%	5%	0%	0%	2%	5%
	Insurance	0%	0%	0%	0%	0%	0%
	Other expenditure – Loose tools & overheads	0%	5%	10%	0%	2%	5%
	Other materials	0%	5%	10%	0%	2%	5%
	Rent of facilities and equipment	0%	5%	0%	0%	2%	5%
	Operations / Repairs and maintenance	0%	5%	10%	0%	2%	5%
	Transportation costs	0%	0%	10%	0%	2%	5%
	Energy costs	0%	0%	0%	0%	0%	0%
	Transportation costs	0%	0%	10%	0%	2%	5%
	Energy costs	0%	0%	0%	0%	0%	0%
Roads and Stormwater	Bulk purchases	0%	0%	0%	0%	0%	0%
	Contracted services	0%	5%	10%	0%	2%	5%
	Employee-related costs – salaries & wages	0%	5%	0%	0%	2%	5%
	Insurance	0%	0%	0%	0%	0%	0%
	Other expenditure – Loose tools & overheads	0%	5%	10%	0%	2%	5%
	Other materials	0%	5%	10%	0%	2%	5%
	Rent of facilities and equipment	0%	5%	0%	0%	2%	5%
	Operations / Repairs and maintenance	0%	5%	10%	0%	2%	5%
	Transportation costs	0%	0%	10%	0%	2%	5%
	Energy costs	0%	0%	0%	0%	0%	0%

## 2.6 Cost adjustment factors

The various elements of cost are driven by different cost factors, some of which are driven by administrative price increases (typically bulk purchases costs), through negotiation (employee-related costs), or through market forces (materials, other expenditure, and repairs and maintenance). This report provides a five-year view on cost estimates that have been adjusted over the projection period as per the cost adjustment factors indicated in the table below:

**Table 8: Cost adjustment factors**

Cost structure	Source	Cost adjustment factor					
		2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Employee related costs	SALGA	6,65%	6,40%	7.00%	6.80%	6.80%	6.80%
CRC adjustment percentage	SAFCEC	5,70%	6.04%	6.04%	6.04%	6.04%	6.04%
Bulk water purchases	DWA	Determined on a scheme to scheme basis					
Bulk electricity purchases	NERSA	8,00%	16.75%	12.69%	12.69%	12.69%	12.69%
Other materials	CPIX	5,40%	5,80%	5,80%	5,80%	5,80%	5,80%
Other expenditure	CPIX	5,40%	5,80%	5,80%	5,80%	5,80%	5,80%
Repairs and Maintenance	CPIX	5,40%	5,80%	5,80%	5,80%	5,80%	5,80%

The operating and maintenance cost estimation was based largely on research using available municipal financial data, as published by the National Treasury. The team also engaged with selected municipalities and analysed costs from the following municipalities:

- Mogale City Local Municipality;
- Buffalo City Metropolitan Municipality (EC)
- Nkangala District Municipality (MPU)
- Thembisile Hani Local Municipality (MPU)
- Polokwane Municipality (LIM)
- Hessequa Municipality (WC)

Zero based cost data for maintenance and operations was also used to test and calibrate the results obtained. Significant cost influencing factors were used in the determination of operating and maintenance costs, to provide for the effect of location, topography and other factors, as indicated below:

- Topography
- Location
- Distance from economic centre
- Development density
- Economy of scale
- Asset condition

For roads and cemeteries there are additional cost influencing factors, namely rainfall and mortality rates respectively. The Depreciated Replacement Cost (DRC) methodology was used during cost establishment to determine the estimated remaining value of assets (for municipalities where asset registers were developed) at the date of cost establishment, this provided information on the typical level of consumption of the asset base. The depreciation charges for infrastructure is based on the estimated useful life of assets, determined at component level and aggregated per service. The annual depreciation thus calculated represent the annual cost of asset renewals under ideal conditions, and is used to represent the depreciation requirements. CRC and DRC values have been calculated for dozens of municipalities in several provinces, and were extrapolated to all municipalities considering the category of municipality.

## **2.7 Towards sustainability and greater efficiency**

### **2.7.1 Demand management**

A key principle adopted for purposes of estimating the quantum of grant allocations is to fund at levels of *realistic efficiency*. This applies specifically to the demand for utility services where national policies prescribed the quantum of free basic water and electricity to be provided to poor households. In the case of water, for example, national policy dictates that each household shall receive 6 kℓ of free water per month. Costing equitable share allocations at this level of consumption would however disadvantage municipalities as, regardless of how efficient a municipality's physical infrastructure networks and management regime may be, some system losses are unavoidable. On the other hand, systems losses in many municipalities are excessive. Not only would it be bad practice to fund inefficiencies, it would place unnecessary burdens on the Fiscus and on the environment. It is therefore proposed that costing estimates, and therefore grant allocations, provide for both national policy provisions as well as *realistic* losses.



Deemed realistic provisions are noted below and have been factored into the cost estimates presented in this report:

**Table 9: Provision for realistic levels of consumption of utility services and production of wastes**

Infrastructure service	Description	Allowance	Unit
Water	Free / Basic	6	kl/month per hh
	Allowance for acceptable level of losses / minimisation	20	%
	Effective demand	86,4	kl/pa per hh
Electricity	Free / Basic	50	kWh/month per hh
	Allowance for acceptable level of losses / minimisation	10	%
	Effective demand	660	kWh/pa per hh
Solid waste	Free / Basic	1,2	kg/day per hh
	Allowance for acceptable level of losses / minimisation	25	%
	Effective demand	329	kg/pa per hh
Sanitation	Free / Basic	4	kl/month per hh
	Allowance for acceptable level of losses / minimisation	0	%
	Effective demand	48	kl/pa per hh

## 2.7.2 Provision for asset care

### ***Provision for maintenance***

Government has over the course of the past decade or so made consistent, sizeable and ever-increasing capital transfers via DORA to municipalities for the construction of municipal infrastructure and amenities for the poor. The creation of infrastructure assets and municipal amenities in turn give rise to operating liabilities in the form of both asset maintenance and depreciation. The traditional approach to budgeting for maintenance was to provide for this item as a percentage of the operating budget (National Treasury established a benchmark of 8%). The basis of estimation for maintenance using this method is flawed, as the quantum of maintenance needs is a function of the size of the asset portfolio to be maintained, and the specific needs and statutory maintenance obligations of specific assets in that portfolio.

A listing of municipalities that established asset registers using the Depreciated Replacement Cost (DRC) methodology is included in Table 2. From this dataset the average Current Replacement Cost (CRC) per service per household was determined and extrapolated to determine CRC and DRC values for all municipalities. The cost estimates provided for maintenance in this report are based on an annualised percentage of CRC of various asset portfolios. Maintenance cost estimates as a percentage of CRC have been confirmed in detailed infrastructure asset management plans prepared for over 50% of the municipalities listed in Table 2.

### ***Provision for depreciation***

Most municipalities calculate depreciation on the basis of historic cost, and current depreciation charges are simply not representative of the actual consumption of asset value. A case study of the insufficiency of depreciation provisions on the basis of historic cost is provided in the following figure, using the example of a reservoir constructed in 1993. Three valuation methods are applied, namely (1) DRC (fair valuation), (2) componentised historic cost and (3) bundled historic cost.

Reporting on the basis of historic cost would result in understatement of the value of the reservoir by some 68-69%, depending on the level of componentisation. At the reporting date the water-retaining reinforced concrete structure, which is the one component within the reservoir that represents a little over 50% of the total value of the reservoir, will have had 29 years' of remaining useful life left. Over time, the magnitude of the understatement using the historic cost method would simply keep on increasing. This is because the CRC of the reservoir will continue to escalate and depreciation will continue to drive down the carrying value of the asset.

**Figure 4: Case study demonstrating the superiority of the DRC method in determining depreciation provisions****A 300 kℓ reservoir constructed in 1993 at a cost of R 890 526**

The Current Replacement Cost (CRC) of the reservoir as at 30 June 2013 would have been in the order of R 2 856 038. The financial position of the reservoir at this reporting date would have been:

Measurement Basis	Carrying value	Accumulated depreciation	Annual depreciation
DRC (fair valuation)	1 457 602	1 398 437	73 089
Componentised historic cost	463 876	426 650	22 790
Bundled historic cost	454 170	436 356	24 044

Measured against the lifespans of its longer-life, high-value components (pipework 80 years, civil structures of about 50 years), about a third of the life of the reservoir has been consumed by 2013. At that point the CRC was close to R 2.9 million – more than three times the original acquisition cost – and will continue to rise over the next forty years until replacement of the reservoir. Yet the total amount available for asset renewal or replacement through depreciation provisions using the historic cost method would forever remain fixed at R 890 526. This amount is woefully insufficient to replace the reservoir now or at any point in the future. Accounting for the reservoir using the DRC mechanism, on the other hand, would ensure that sufficient provision for replacement is made through depreciation charges that continually keep track with escalation in CRC. From a sustainability point of view, therefore, DRC is the preferred method, and is therefore the method chosen to model depreciation provisions that forms part of the operating cost envelope per service modelled for each municipality.

**Modelling for application of capital investment and asset renewal needs**

There is increasing recognition that asset care has been neglected in the municipal space, and that a renewals backlog is emerging. The World Bank, the National Treasury, the FFC and South African Cities Network have all in recent years published research on this matter. National Treasury has also issued the MFMA Circular 55 that requires municipalities to allocate at least 40% of their capital budgets towards asset renewal. Cost modelling informing the cost estimates presented in this report considered two scenarios of the possible treatment of asset renewals within a municipality's capital investment programme, as follows:

**Model A: Asset sweating**

This scenario models capital investment based on municipal budgets, and assumes a fixed split between investment in infrastructure to be renewed, and new infrastructure or infrastructure to be upgraded, based on reported results and selected interviews. This scenario was modelled as follows:

1. Capital investment for 2013/14 – 2015/16 based on available municipal budget data (MTREF), with high preference given to creation of new infrastructure.
2. Investment for the period 2016/17 onward based on average for MTREF and adjusted with SAFCEC based assumed escalation (of 6.04% /annum).
3. Initial investment in renewals based on average for number of municipalities (of various categories), and progressively increased to meet the '40% of capital invested required'.

**Model B: Responsible asset custodianship**

The application of capital investment (to renewal, new infrastructure creation and upgrading) is based on rational approach aimed at sustainability in asset portfolios and therefore the productive capacity vested in those portfolios. It is therefore not primarily based on municipal budget provisions, but rather on a combination of the needs to address service access backlogs through infrastructure creation and upgrading, and with respect to renewal, the condition and level of annual asset consumption determined through the DRC method. This scenario was modelled as follows:

1. Investment in 'New and upgrading of infrastructure' has been based on the growth in households, with allowance for scenario modelling – a key assumption was the annual production of additional fully served dwellings equal to 100% of new household formation.
2. Investment in 'Renewals' is based on a (service specific, component based) annual depreciation as a percentage of the CRC value – currently set to equal the annual depreciation value (maintaining asset status), and with a scenario modeller function provided to model:
  - a. increasing the investment proportionally (to eradicate renewal backlogs/ improve asset health status), or
  - b. decreasing the investment where municipalities cannot meet the target – with a resultant decrease in asset health.

Cost impacts, both of a capital and operating nature, of both models have been calculated and are presented in this report. The preferred funding model is Model B (2) (a) as described above.

## 2.8 Population size and growth

The model is based on the households per municipality, which forms the basis, and is used in conjunction with other data and attributes to determine and estimate key elements such as the infrastructure replacement costs. The estimates presented in this report takes into account specifically the number of indigent households in municipalities. The household data and growth was obtained from Statistics SA, and population estimates were amended using the Census 2011 data as basis, and updated based on the 2013 General Household Survey. This approach was followed by Treasury in the determination of the current ES, and published on the MFMA web site '[http://mfma.treasury.gov.za/Media\\_Releases/LGESDiscussions/Pages/default.aspx](http://mfma.treasury.gov.za/Media_Releases/LGESDiscussions/Pages/default.aspx)'.

1. The total number of households nationally for 2014/15 amounts to 14 877 844 and the number of indigent households to 8 702 989, or 58.49% of the total number.
2. The corresponding numbers for 2015/16 are 15 336 205 in total, and the number of indigent households to 8 965 789, with indigent households accounting for 48.46 % of total households.

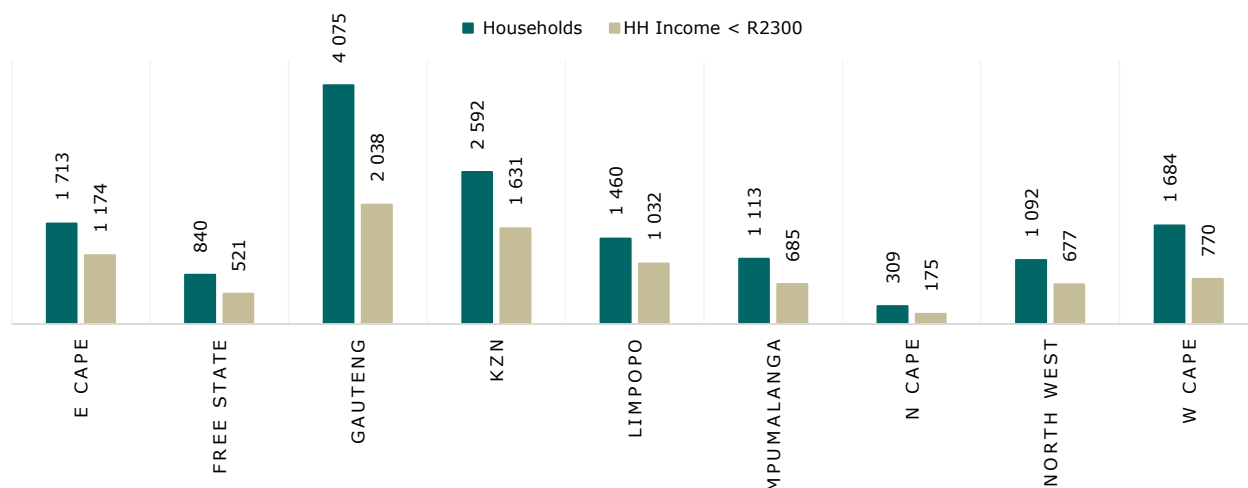
A significant factor to be noted is that in the model prepared in the first phase the number of households with income below R2 300/m increased from 6 288 963 in 2011 (based on census 2011 figures), to 6 638 272 in 2014 (applying growth figures to census 2011 and used as basis in the 2014 model). Based on the household numbers that have now been adopted, the number of low income households have risen very sharply to 8 702 989 in 2015 and 8 965 789 in 2016 (as per the LGES, which used 2013 household survey figures to adjust the census 2011 data), equivalent to an increase of 31% during 2014, or 7.35% pa from 2011 to 2015. Part of the reason for the increase may be that household numbers are increasing more rapidly than population numbers to decreasing number of people per household. The household numbers for 2015, as well as the numbers for households per municipality, with monthly income below the threshold of R 2 300 and growth rate as determined by Treasury and applied in this model, is shown in **Appendix C**. The comparative number of households, and households with income less than R 2 300/ month is displayed per province in the table and image below:

**Table 10: Households per Province: 2014/15**

Province	Households	HH with Income < R2 300
Eastern Cape	1 712 757	1 174 335
Free State	840 444	521 195
Gauteng	4 074 572	2 037 619
Kwazulu-Natal	2 592 308	1 631 433
Limpopo	1 460 475	1 032 486
Mpumalanga	1 112 741	685 131
Northern Cape	308 976	174 651

Province	Households	HH with Income < R2 300
North West	1 091 621	676 505
Western Cape	1 683 951	769 634
<b>Total</b>	<b>14 877 844</b>	<b>8 702 989</b>

Figure 5: Households per Province (expressed in '000)



## 2.9 Capital Need Elements and Grant Funding

Capital subsidy grants are provided to allow municipalities to provide or upgrade infrastructure services to serve the growth in low income households as well as eradicate the access backlogs. The estimated capital needs consist of the investment in new assets (and or upgrading existing assets) required to provide infrastructure for provision of basic services for the growth in low income households, plus investment required for eradicating the existing access backlogs.

### Modelling the Backlog

The best source of information on backlogs for various services, even if slightly outdated, and considering the changes to backlogs resulting from new (and upgraded) infrastructure provided, is the 2011 census data. A search for more recent data that can be considered as reliable and authoritative enough to be used as alternative to census 2011 data have not yielded significant results, although publications by for instance INEP, DWS have provided insight and information that could be used to inform assumptions regarding the change in backlog over the intervening years.

Based on the available information, the backlog for the various services for 2015 has been estimated to be:

Table 11: Assumed Backlogs

Province	Energy	Water	Sanitation	Cemeteries	Solid Waste	Roads
W CAPE	5.8%	2.7%	9.7%	12.9%	14.4%	12.9%
N Cape	10.8%	6.4%	18.1%	13.9%	25.5%	13.9%
E Cape	17.8%	25.7%	37.0%	31.2%	50.9%	31.2%
FS	8.2%	3.9%	20.3%	17.9%	24.0%	17.9%
KZN	25.3%	29.7%	37.4%	34.2%	63.9%	34.2%
MP	11.3%	13.1%	30.6%	18.4%	39.5%	18.4%
LIM	9.4%	21.2%	50.2%	9.8%	63.6%	9.8%
NW	13.1%	14.0%	35.5%	19.0%	48.6%	19.0%
GT	12.0%	5.0%	11.0%	20.5%	11.5%	20.5%
<b>Total</b>	<b>14.5%</b>	<b>16.8%</b>	<b>30.2%</b>	<b>22.0%</b>	<b>43.2%</b>	<b>22.0%</b>

For the purpose of calculating the annual rate and cost of backlog eradication, it has been assumed that the backlog in the various municipalities will be reduced at the rate of 15% of the 2015 backlog p/a. This factor is adjustable, for each sector individually, in the model.

### Grant Funding

The capital grants as published by Treasury (as the Divisional Revenue Bill: Government Gazette No. 38458 of 13 February 2015) provides both information and the quantum of grants for this purpose, such as:

- the 'Municipal Infrastructure Grant' known as 'MIG', and intended to fund the provision of infrastructure for basic services, roads and social infrastructure for poor households in non-metropolitan municipalities;
- the 'Urban Settlements Development Grant' or USDG), for funding the upgrading of informal settlements in metropolitan municipalities; as well as
- the 'Integrated National Electrification Programme Grant' or INEP for funding connecting of the 'poor households' to electricity, for both Municipal and Eskom; and
- a number of other grants for capital funding, including Bucket eradication, Regional Bulk Infrastructure Grant (RBIG); as well as
- grants for management and institutional purposes, Expanded Public Works (EPWP) programme etc.

The two most important grants with respect to the funding of capital needs are the Municipal Infrastructure Grant (MIG) and the Urban Settlement Development Grant (USDG). The MIG Grant consist of the following elements:

- C Constant to ensure increased minimum allocation for small municipalities (this allocation is made to all municipalities)
- B Basic residential infrastructure (proportional allocations for water supply and sanitation, roads and other services such as street lighting and solid waste removal)
- P Public municipal service infrastructure (ring-fenced for municipal sport infrastructure)
- E Allocation for social institutions and micro-enterprises infrastructure
- N Allocation to the 24 priority districts identified by government

The 'Basic' allocation is apportioned as follows:

**Table 12: Assumed Backlogs**

Municipal infrastructure grant (formula)	Component weights	Proportion of MIG
B-component 75.0% 10 291	<b>75.0%</b>	
Water and sanitation	72.0%	54.0%
Roads	23.0%	17.3%
Other	5.0%	3.8%
P-component	<b>15.0%</b>	
Sports	<b>100.0%</b>	15.0%
E-component	<b>5.0%</b>	5.0%
N-component	<b>5.0%</b>	5.0%
<b>Total</b>	<b>100.0%</b>	<b>100.1%</b>

The apportionment of the USDG was done on the same basis as for the MIG. For comparison of capital investment required to Capital Grant funding two scenarios have been considered, the first comparing the estimated capital needs to the municipal MIG grant allocation (consisting of 75% of the basic MIG), the USDG and the municipal INEP grants. The second scenario, for which results are shown in this report, includes:

- Municipal Infrastructure Grant (MIG);
- Urban Settlements Development Grant (USDG);
- Integrated National Electrification Programme Grant (INEP - Eskom and municipal) electricity grant;
- Municipal Water Infrastructure Grant (MWIG)
- Bucket eradication grant; and
- Regional Bulk Infrastructure Grant (RBIG).

### 3. Capital Cost Needs: Electricity



#### 3.1 Typical scope of infrastructure to be funded

Municipal electricity infrastructure typically includes the following asset types:

- HV and MV Substations and switching stations
- Mini-substations
- MV transformers (Pole Mounted, Floor Mounted or Indoor)
- Overhead conductors (HV, MV and LV)
- Cables (HV, MV and LV)
- Service connections (kiosks, conductors, meters)

For purposes of costing estimates in this report it is assumed that all municipalities buy bulk electricity from Eskom, and that the extent of off-grid supply is not material - hence generation infrastructure is excluded from the scope of infrastructure to be funded.

#### 3.2 Capital cost estimates for provision of electricity to the poor: Model B: Responsible asset custodianship

Cost estimates were developed for electricity infrastructure required to service low income households. Costs are inclusive of all infrastructure elements from the Eskom bulk supply point to the individual households, including the connections and meters, and design and overhead costs. The average cost of service per low income household amounts to R 16 021 per household, with a total value of R 4.3 billion for growth needs, and R 3.1 billion for backlog reduction (at 15% backlog reduction/a) for 2015/16. The estimated capital cost required to provide electricity infrastructure service low income households for the 2015/16 financial year, as well as the INEP grant (for municipalities and Eskom) per province, is indicated in **Table 13**.



**Table 13: Estimated infrastructure funding needs and grants (low income)**

Electricity	Growth	Backlog	MIG Grants	MIG / Growth + Backlog	Funding Need/ Poor HH	Growth
Eastern Cape	294 310 549	530 441 215	1 240 554 000	150%	46 475	17 746
Free State	184 984 515	108 562 323	185 591 000	63%	26 318	11 154
Gauteng	1 424 322 370	636 193 213	254 436 000	12%	23 992	85 883
Kwazulu-Natal	767 689 091	1 058 842 304	1 415 566 000	78%	39 458	46 290
Limpopo	516 472 892	248 804 607	1 128 195 000	147%	24 574	31 142
Mpumalanga	386 219 374	200 604 221	461 403 000	79%	25 199	23 288
Northern Cape	74 088 534	48 222 920	177 259 000	145%	27 381	4 467
North West	316 562 139	228 124 857	440 001 000	81%	28 536	19 088
Western Cape	393 772 403	113 890 031	290 578 000	57%	21 382	23 743
<b>Total</b>	<b>4 358 421 866</b>	<b>3 173 685 692</b>	<b>5 593 583 000</b>	<b>74%</b>	<b>28 661</b>	<b>262 801</b>

### 3.3 Comparison of modelled results to DORA allocations

The DORA allocation for electricity infrastructure for the poor is made in terms of the INEP (Integrated National Electrification Programme). The INEP is an initiative aimed at providing the capital resources to municipalities (and Eskom) to address the electrification needs of low income households, which consist of the growth and the service access backlog. The initiative aims at servicing residential dwellings permanently occupied by households with income lower than the threshold determined from time to time, currently R 2 300/month. The INEP allocation in terms of the 2015/16 DORA including both municipal and Eskom grants, (as comprehensive and reliable separate figures for municipal and Eskom low income household customers served is not available) is as follows:

**Table 14: Total DORA allocation for INEP**

INEP Annual Grant (R 000)	2015/16	2016/17	2017/18
Municipalities	1 980 340	2 036 246	2 197 048
Eskom	3 613 243	3 776 334	3 946 154
<b>Total</b>	<b>5 593 583</b>	<b>5 812 580</b>	<b>6 143 202</b>

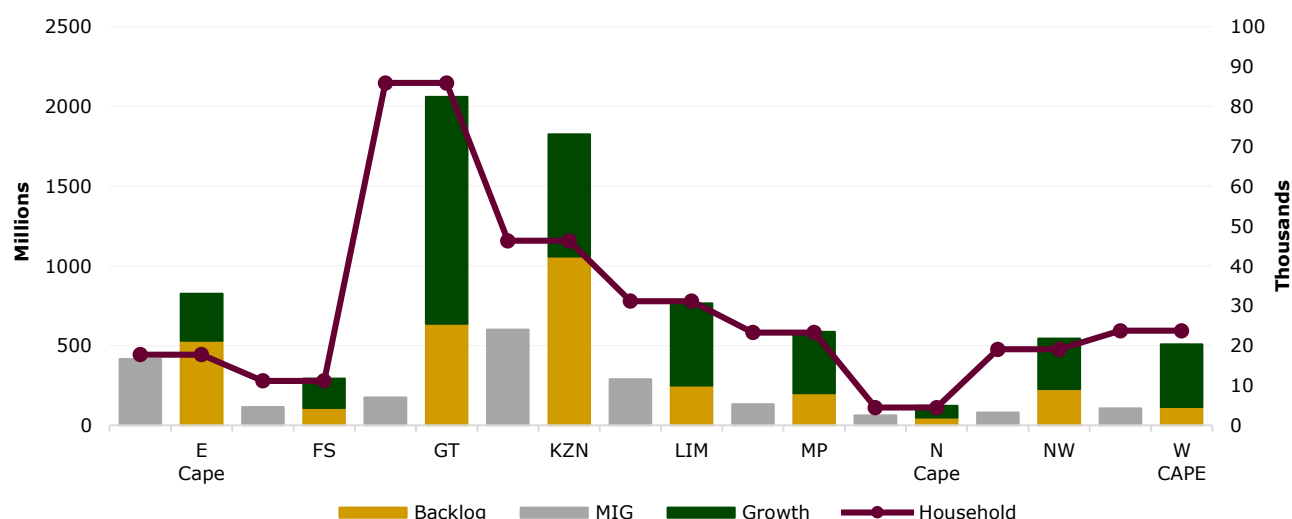
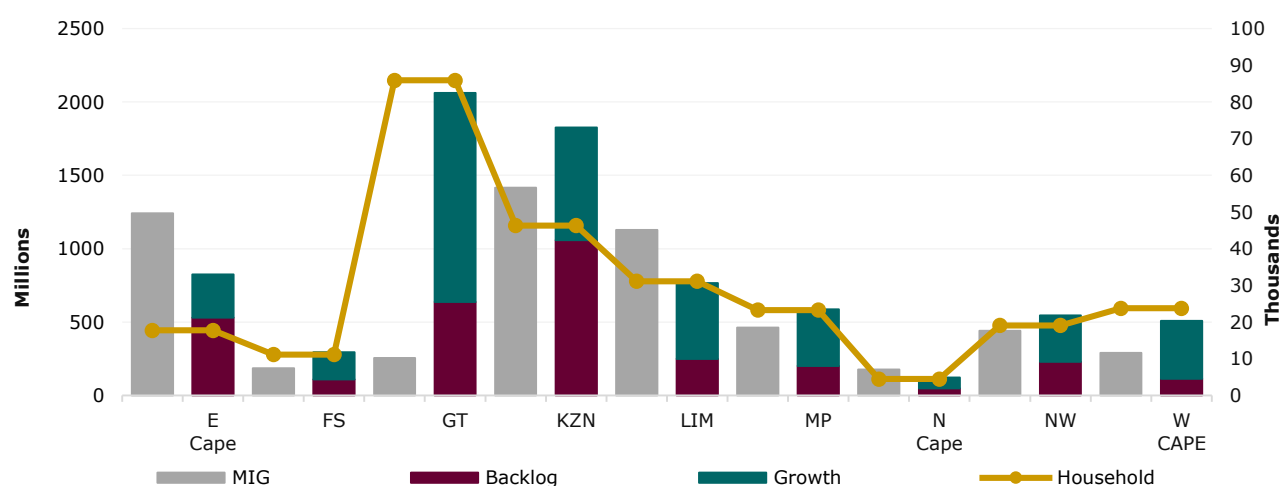
The average rate per household – derived from the growth in the number of poor households per province and the amount allocated per for 2015/16 - varies considerably across provinces as can be seen in **Table 15**:

**Table 15: MIG Growth and Backlog electrification allocation per Province (INEP) 2015/16**

Province	Growth Poor hh	Electricity (R 000)	Average rate/ hh (R)
Eastern Cape	17 746	1 240 554	69 906
Free State	11 154	185 591	16 639
Gauteng	85 883	254 436	2 963
Kwazulu-Natal	46 290	1 415 566	30 581
Limpopo	31 142	1 128 195	36 228
Mpumalanga	23 288	461 403	19 813
Northern Cape	4 467	177 259	39 679
North West	19 088	440 001	23 051
Western Cape	23 743	290 578	12 238
<b>Total</b>	<b>262 801</b>	<b>5 593 583</b>	<b>21 284</b>

The average allocation per customer amounts to R 21 284 per household (growth, poor) for 2015/16. If the estimated cost is compared to the total MIG allocation, the MIG allocation comprise 74% of the capital needs, based on reducing the backlog by 15% per annum. The figure below displays the estimated capital needs against the MIG allocation, also indicating the growth in low income customers:



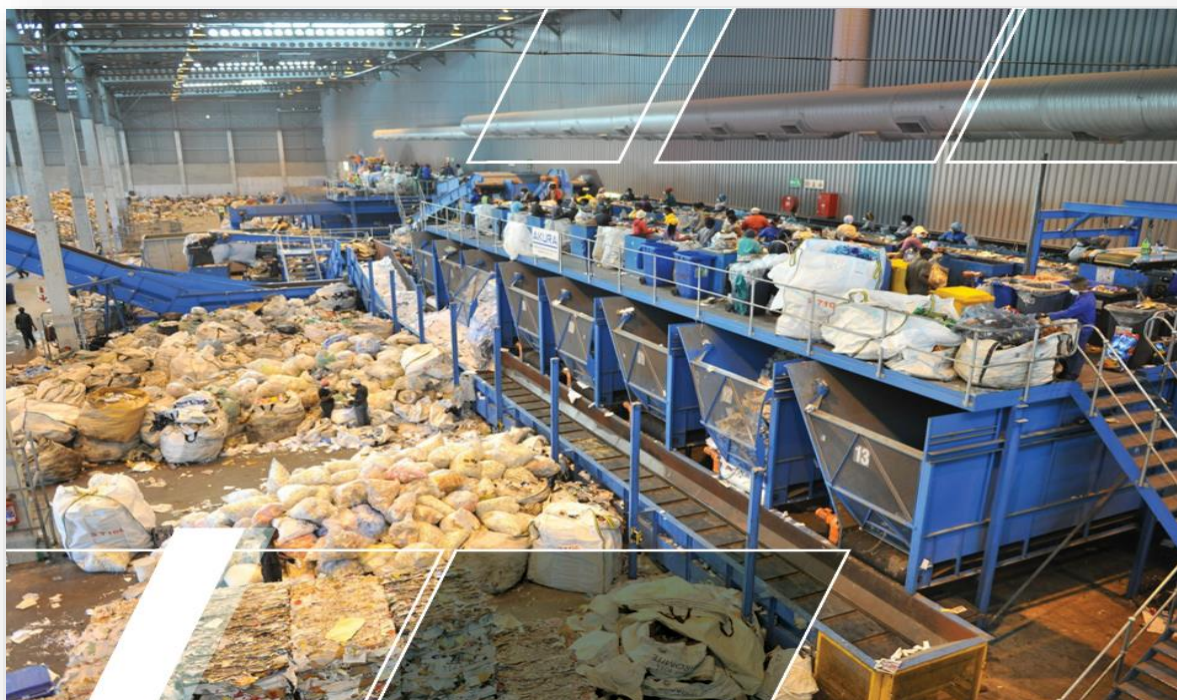
**Figure 6: Comparison of electricity capital funding needs for the poor – MIG Municipal grant vs estimated costs****Figure 7: Electricity capital funding needs for the poor – MIG Municipal + Eskom grant vs estimated costs**

The allocation for electrification per household varies significantly from one province (and municipality) to the next – especially and consistently across all services for the Eastern Cape – for reasons unknown. This anomaly will need to be given further attention. It has also been noted that there are a number of municipalities with '0%' growth in poor households, yet infrastructure grants are still provided. This is assumed to have been made as part of the process of funding allocated towards eradicating existing backlogs and which should enable these municipalities to eradicate the backlogs sooner.

### 3.4 Recommendations

The estimated infrastructure cost for electricity services used in the Model were increased from the final values used in the final version of the model (to determine the ES component) in 2014, but still relatively low, and providing for the minimum infrastructure and service level only. The need for bulk supply infrastructure, and the fact that actual installations are typically not 20 amp connections should be given consideration, as it is not considered practical to design and install networks that will not be able to supply the actual demand two – five years after installation. Additional information regarding the basis used for determining the MIG allocations will be necessary to further investigate the anomalies regarding the variation from, and amongst municipalities and provinces – including the household growth that was used as basis, since this might be a contributing factor explaining anomalies.

## 4. Capital Cost Needs: Refuse Removal and Disposal (Solid Waste)



### 4.1 Typical scope of infrastructure to be funded

Municipal solid waste infrastructure typically includes the following immovable asset types:

- Landfill sites (active and closed)
- Transfer stations
- Garden waste sites
- Drop-off sites

The service differs from other infrastructure services with regard to the methods used to convey the product, which is not done by way of a fixed reticulation network, but by transporting the waste product by road using specialised vehicles.

### 4.2 Capital cost estimates for provision of solid waste services to the poor: Model A: Asset sweating

The investment required in new infrastructure to serve the growth in low income households is the same whether for the 'Model A: Asset sweating' scenario or the 'Model B: Responsible asset custodianship'. The difference between the two scenarios is to be found in the negative effect (under the 'Model A' scenario) on the standard of service, in the deferred investment in renewals, the increased level and cost of maintenance required, and the reduced life expectancy of infrastructure.

### 4.3 Capital cost estimates for provision of solid waste services to the poor: Model B: Responsible asset custodianship

The capital needs for infrastructure required to serve the growth in low income households (for 2016) has been estimated at R 274 million. The needs per province is shown in **Table 16**:

**Table 16: Growth and backlog needs for solid waste and capital grants for the poor per province - 2015/16**

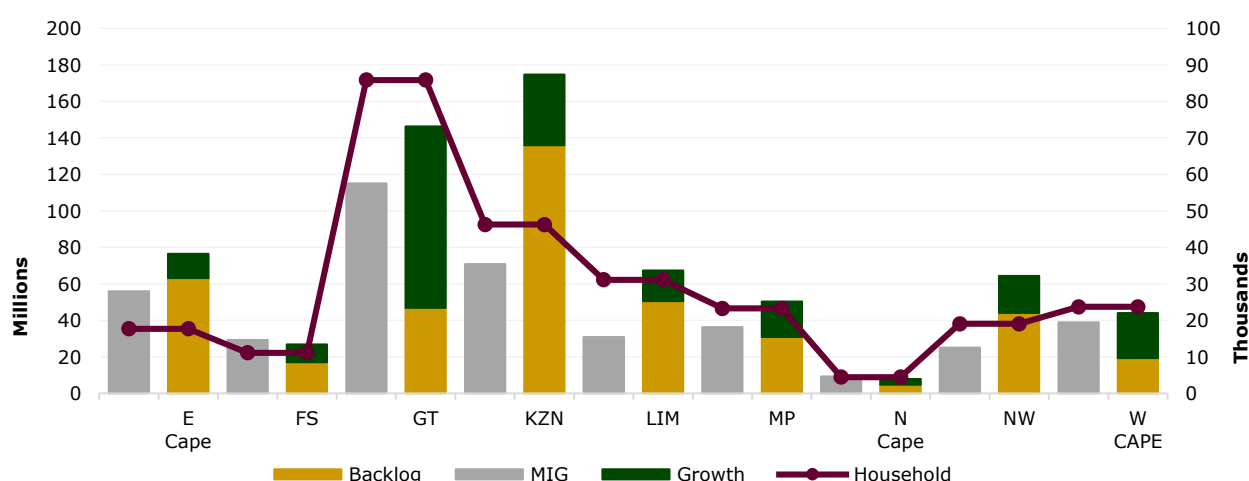
Solid Waste	Growth	Backlog	MIG Grants *	MIG / Growth+Backlog	HH (Growth)
Eastern Cape	13 357 549	63 163 156	56 074 000	73%	17 746
Free State	9 802 596	17 065 325	29 366 000	109%	11 154
Gauteng	99 431 932	46 971 158	115 131 000	79%	85 883
Kwazulu-Natal	38 820 478	136 008 071	70 940 000	41%	46 290
Limpopo	16 835 861	50 650 857	30 939 000	46%	31 142
Mpumalanga	19 474 437	30 974 776	36 324 000	72%	23 288
Northern Cape	3 147 238	4 873 209	9 335 000	116%	4 467
North West	20 307 331	44 144 162	25 152 000	39%	19 088
Western Cape	24 814 050	19 335 415	38 932 000	88%	23 743
<b>Total</b>	<b>245 991 473</b>	<b>413 186 130</b>	<b>412 193 000</b>	<b>63%</b>	<b>262 801</b>

\* 54% of 'Other' allocation under category B assumed

#### 4.4 Comparison of modelled results to DORA allocations

The MIG grants aim to subsidise the capital cost of providing basic services to households with an income below the threshold level (R 2 300/hh/month). The objectives of the funding grant is the provision of appropriate infrastructure for municipal services. The provision for solid waste services under DORA is included in the category 'Other' as part of the B-Component of the MIG Grant.

The difference between the estimated amount for provision of solid waste services and the DORA LGES amounts to R 247 million, translating to a shortfall of 37% of the needs when compared to the MIG allocation. The combined growth and backlog eradication needs amount to 86% of the MIG 'Other' allocation. The backlog in solid waste services and the dire state of landfill facilities in many municipalities is regarded as an important aspect included in the objective of the MIG grant, over and above the provision of services to the additional numbers of low income households. The figure below displays the estimated capital needs for solid waste immovable infrastructure against the MIG allocation, while indicating the growth in low income customers:

**Figure 8: Comparison of solid waste capital funding needs for the poor – MIG grant vs estimated costs**

#### 4.5 Recommendations

The combined growth and backlog eradication needs amount to 86% of the MIG 'Other' allocation. The allocation is also intended for funding aspects such as public lighting. Since Solid Waste services are an essential service, it is recommended that either the total allocation for 'Other', or the proportion of the 'Other' grant allocation allowed for Solid Waste be increased.

## 5. Capital Cost Needs: Roads and Stormwater



### 5.1 Typical scope of infrastructure to be funded

Municipal roads and stormwater infrastructure typically includes the following asset types:

- Roads;
- Road furniture (regulatory signs and signage, traffic signals, road markings, guard rails etc.);
- Stormwater infrastructure, inclusive of pipes, kerb inlets, culverts and stormwater attenuation infrastructure;
- Kerbs;
- Streetlights; and
- Bridges.

The MIG Guidelines indicate that although no national standard has been adopted, for rural areas the basic level of service to be provided is a minimum of access to the center point in a village or an area, and that this basic service can be extended to include some of the main accesses, spurs or lanes linked to the main thoroughfare in the village. The guidelines further state that:

*'In the urban context, a gravel road is not acceptable as a basic service. This is due to the impact of O & M costs and other urban road users applications (e.g. emergency services refuse removal, street sweeping by mechanical means), the type of vehicles (e.g. taxis, buses), as well as the vehicle count per day. In the metropolis areas, the basic level of road service is a durable, all weather surfaces that results in a minimum of O & M costs to be incurred'*

For the purpose of the model it has been assumed that in rural areas gravel roads are provided, with paved distributor and collector roads, and that in the urban area paved roads are provided as a basic service.



## 5.2 Capital cost estimates for provision of roads and storm water infrastructure to the poor: Model B: Responsible asset custodianship

The all-inclusive cost for basic roads and stormwater services to serve the growth in low income customers for 2016 has been estimated at R 5 149 million. Estimates took into account the level of urbanisation, allowing for a higher target level of basic service in urban areas (paved roads plus storm water), compared to the areas outside the urban environment, where the target level will be predominantly gravel roads and the associated appropriate storm water infrastructure.

**Table 17: Growth and estimated backlog needs for roads and storm water per Province 2015/16**

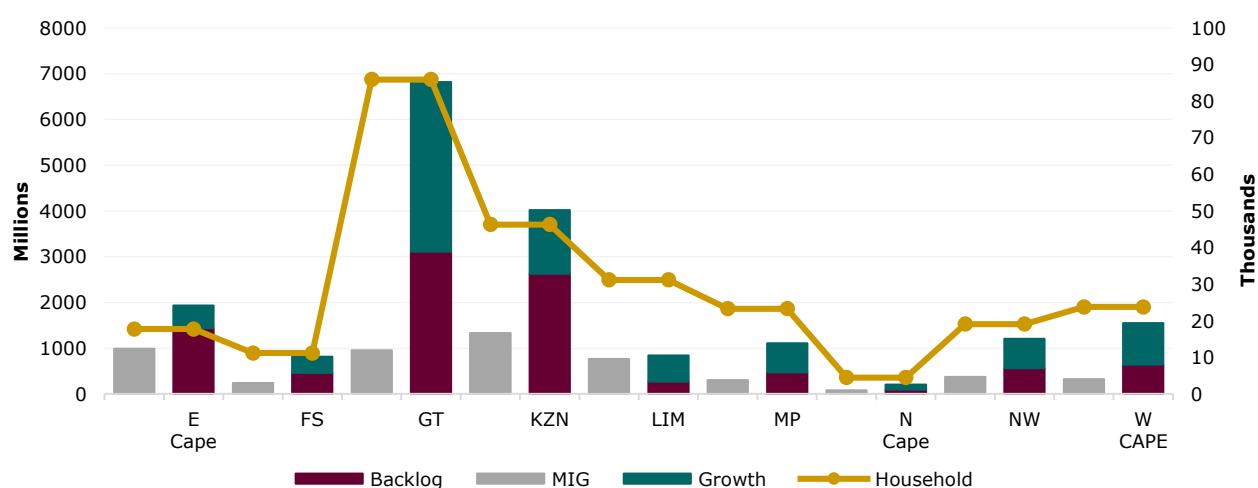
Roads & stormwater	Growth	Backlog	MIG Grants	MIG / Growth+Backlog	HH Growth
Eastern Cape	498 784 906	1 435 916 414	988 994 446	51%	17 746
Free State	360 012 925	458 104 691	243 405 608	30%	11 154
Gauteng	3 706 480 965	3 112 891 631	954 280 350	14%	85 883
Kwazulu-Natal	1 395 909 926	2 626 505 694	1 332 764 302	33%	46 290
Limpopo	573 908 683	269 656 473	764 329 238	91%	31 142
Mpumalanga	632 243 030	475 053 104	301 078 913	27%	23 288
Northern Cape	110 903 086	92 592 451	77 375 220	38%	4 467
North West	644 419 353	563 762 813	375 465 329	31%	19 088
Western Cape	914 526 109	637 975 833	322 695 405	21%	23 743
<b>Total</b>	<b>8 837 188 982</b>	<b>9 672 459 103</b>	<b>5 360 388 809</b>	<b>29%</b>	<b>262 801</b>

The DORA allocation under MIG and USDG, aggregated per Province, is included in the Table above. When the amounts per province is used to derive the average cost per new low income household, the resulting 'average unit rates' vary from R 27 088/ hh in Limpopo to R 109 022/ hh (in the Eastern Cape). The average ratio of funding to needs is 29% with the backlog eradication based on a reduction of 15% per annum, ranging from 14% to 91%. The variations observed is partly the result of varying backlog levels.

## 5.3 Comparison of modelled results to DORA allocations

The MIG allocation, as indicated in **Table 16**, amounts to R 5 327 million which is only 3.5% more than the estimated infrastructure cost for low income household growth in 2016. The figure below displays the estimated capital needs against the MIG allocation graphically, while also indicating the growth in numbers for low income customers:

**Figure 9: Comparison of roads and storm water capital funding needs for low income households – MIG grant vs estimated costs**



As for other services, there is a noticeable difference across provinces, ranging from MIG being 68 % more than the estimated cost for Limpopo, to 50% less than in Gauteng (with Eastern Cape once again differing excessively, with the MIG allocation three times higher than the estimated cost).

#### **5.4 Recommendations**

If the MIG grant was intended for services to the growth in poor only, the shortfall in funding would have been reasonable. When the backlog reduction is included, as indicated above, the grant funding is evidently not sufficient to provide essential roads and stormwater services to low income households. Based on the information available it appears that the allocation would have to be increased substantially in order to allow for the reduction of the existing backlog, while the allocation to individual municipalities, and hence provinces, should be revisited to ensure that the allocation is done consistently.

## 6. Capital Cost Needs: Water



### 6.1 Typical scope of infrastructure to be funded

Municipal water infrastructure typically includes the following asset types:

- Boreholes;
- Dams;
- Water Treatment Works
- Pump stations;
- Reservoirs;
- Bulk main pipelines; and
- Distribution network.

### 6.2 Capital cost estimates for provision of water infrastructure to the poor: Model B: Responsible asset custodianship

The estimated capital needs for immovable infrastructure required to serve the 'new' low income households (growth for 2016) amount to R 4 982 million at national level. The estimates provide for bulk and distribution needs, adopting target levels suited to the nature of the municipality. The estimated needs, aggregated per province, are indicated in the table that follows:

**Table 18: Growth and backlog capital needs for water services, and capital grants (MIG, MWIG, RBIG) for low income households per Province 2015/16**

Water	Growth	Backlog	MIG Grants	MIG / Growth+Backlog	HH Growth
Eastern Cape	331 555 107	909 780 946	2 080 020 737	168%	17 746
Free State	206 835 698	61 429 072	700 184 690	261%	11 154
Gauteng	1 408 278 658	291 655 224	1 686 656 200	99%	85 883
Kwazulu-Natal	858 357 297	1 446 612 926	3 683 720 707	160%	46 290
Limpopo	622 504 299	680 988 239	1 900 045 585	146%	31 142
Mpumalanga	449 530 147	273 886 610	973 756 950	135%	23 288
Northern Cape	89 293 550	34 524 436	279 071 540	225%	4 467
North West	357 891 624	282 934 412	593 637 461	93%	19 088
Western Cape	411 783 839	60 403 076	582 205 460	123%	23 743
<b>Total</b>	<b>4 736 030 219</b>	<b>4 042 214 942</b>	<b>12 479 299 331</b>	<b>142%</b>	<b>262 801</b>

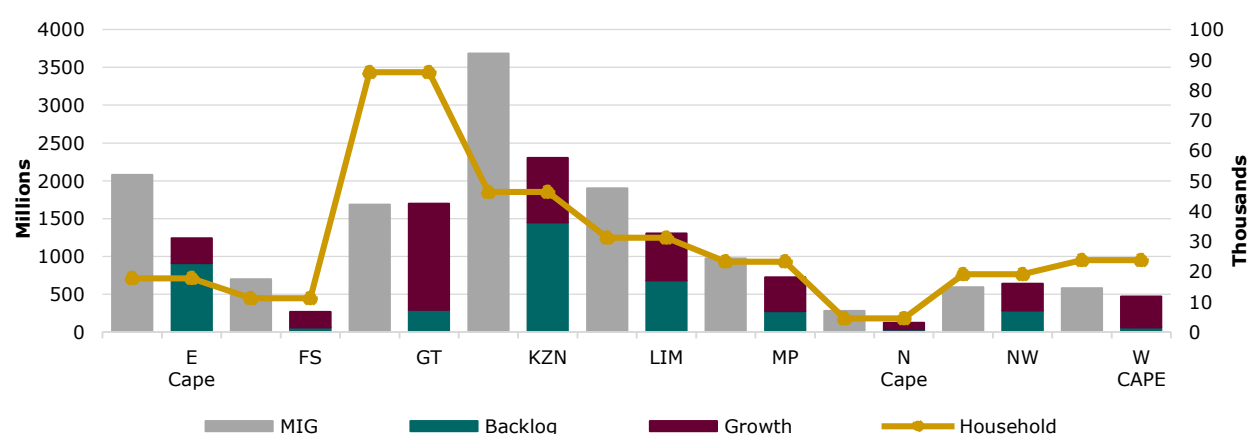
The assumption, as for other services, is that the backlog is to be eradicated at 15% per annum.

### 6.3 Comparison of modelled results to DORA allocations

It has been assumed that the grant allocation for infrastructure (the MIG and the USDG components) under DORA is split equally between water and sanitation. In practice this will mostly not be the case, since the needs of municipalities vary over time.

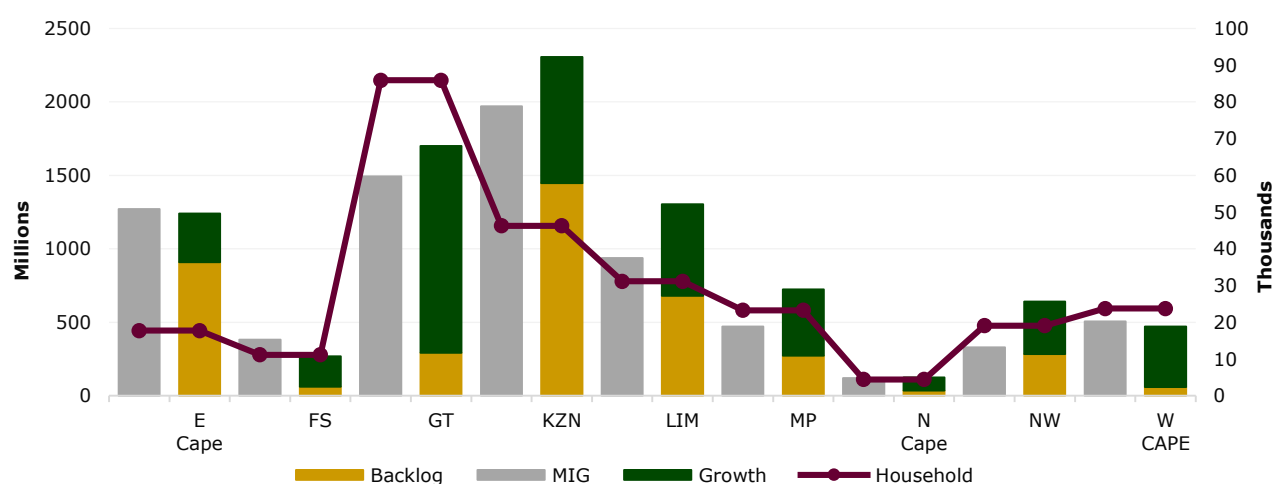
The MIG allocation - P component, including the USDG (Urban Settlements Development Grant) - is significantly larger than the estimated requirements for provision of services for growth in poor households. The difference amounts to approximately 44% based on the MIG account, with the estimate being less. This does not yet take into account the RBIG (Regional Bulk Infrastructure Grant), the Bucket eradication programme, MWIG (Municipal Water Infrastructure Grant) or the RHIG (Rural Housing Infrastructure Grant). The additional grants, with RBIG at R 4.9 billion, and the remainder at R 3 686 million increase the infrastructure grant allocation to a total of R 12.5 billion. The estimated cost to serve the growth in low income customers for 2016 has been shown to be significantly lower than the MIG and USDG allocation of R 7.5 billion. The backlogs of current water and sanitation services, both in terms of access and in terms of sizeable capacity and condition backlogs explains why the allocations outstrip the estimated cost for services to low income household to the extent that it does. The figure below displays the estimated capital needs against the MIG allocation, also indicating the growth in low income customers:

**Figure 10: Comparison of water funding needs for low income households – MIG, RBIG, MWIG grants vs estimated costs**





**Figure 11: Comparison of water funding needs for low income households –  
MIG grant only vs estimated costs**



The comparison shows (other than the Eastern Cape with the estimated costs at 25% of the MIG allocation), MIG allocations on average to be 34% above the estimates. For both Mpumalanga and Gauteng the estimates correlates with the MIG allocations with difference of -4% for Gauteng, and 4% for Mpumalanga.

#### 6.4 Recommendations

The MIG/ USDG infrastructure allocations are evidently sufficient to address the provision of water services infrastructure and to meet the growth in low income housing, as well as to address backlog and other needs amounting to approximately R 8.8 billion/annum.

## 7. Capital Cost Needs: Sanitation



### 7.1 Typical scope of infrastructure to be funded

Municipal sanitation infrastructure typically includes the following asset types:

- Reticulation network;
- Main outfall sewers;
- Pump stations; and
- Waste Water Treatment Works.

### 7.2 Capital cost estimates for provision of sanitation infrastructure to the poor: Model B: Responsible asset custodianship

The estimates provide for reticulation and bulk needs, including treatment in the case of waterborne services, and all associated costs to create the infrastructure assets. Target levels of service appropriate to the needs of the municipality were adopted – waterborne services for urbanised areas, and largely VIP (Ventilated Improved Pit latrines) for rural areas.

The estimated capital needs for immovable infrastructure required to serve the 'new' low income households (growth for 2016) amount to R 4 595 million overall. The estimated needs, aggregated per province, are indicated in the **Table 19**.

**Table 19: Growth and estimated backlogs capital needs for sanitation services, and MIG, RBIG, MWIG and Bucket eradication for low income households per Province 2015/16**

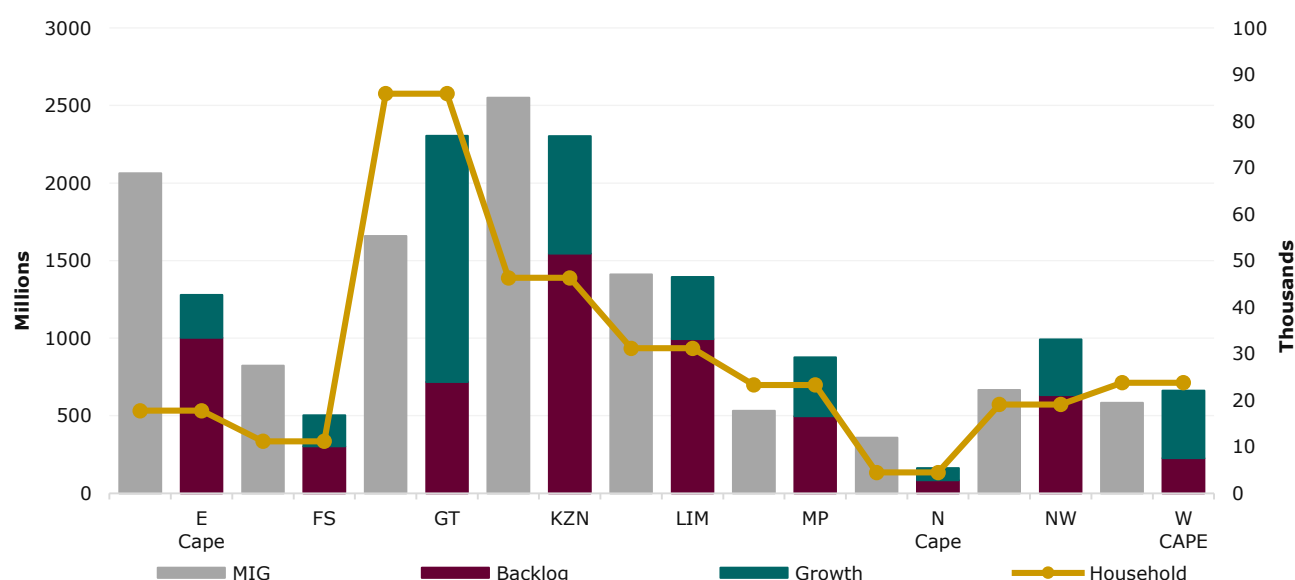
Sanitation	Growth	Backlog	MIG Grants	MIG / Growth+Backlog	HH Growth
Eastern Cape	276 564 413	1 001 645 912	2 063 414 821	161%	17 746
Free State	200 071 658	301 685 328	821 889 690	164%	11 154
Gauteng	1 588 905 275	716 580 803	1 659 656 200	72%	85 883
Kwazulu-Natal	757 530 895	1 545 710 499	2 549 943 835	111%	46 290
Limpopo	401 298 802	994 077 845	1 410 055 935	101%	31 142
Mpumalanga	380 078 374	496 891 038	531 553 950	61%	23 288
Northern Cape	77 603 659	83 464 939	357 176 540	222%	4 467
North West	358 765 553	633 123 976	665 254 270	67%	19 088
Western Cape	435 058 295	227 003 481	582 205 460	88%	23 743
<b>Total</b>	<b>4 475 876 924</b>	<b>6 000 183 821</b>	<b>10 641 150 701</b>	<b>102%</b>	<b>262 801</b>

The average cost per additional household amounts to R 17 000, while the ratio between grant funding and capital needs, based on a 15% annual backlog reduction range between 61% and 222%.

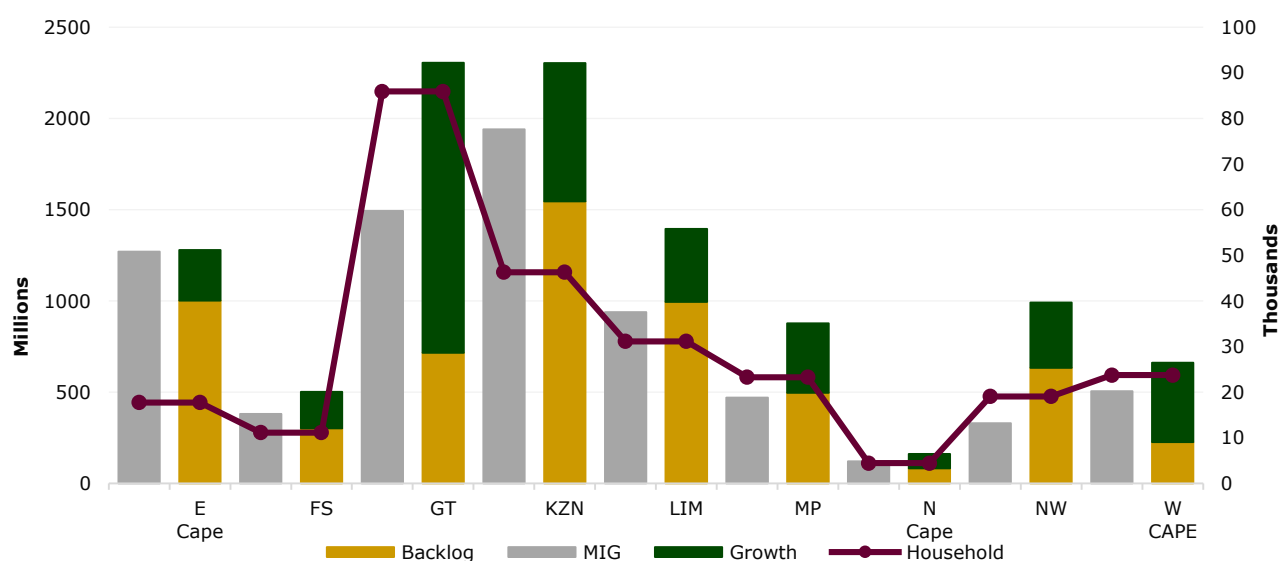
### 7.3 Comparison of modelled results to DORA allocations

As indicated under section 6.2, it was assumed that 50% of the allocations under MIG and USDG is for sanitation services, and other grants were excluded for this comparison. The figures below display the estimated capital needs against the MIG allocation, also indicating the growth in low income customers:

**Figure 12: Comparison of sanitation capital funding needs for low income households – MIG, RBIG, MWIG, Bucket eradication grants vs estimated Costs**



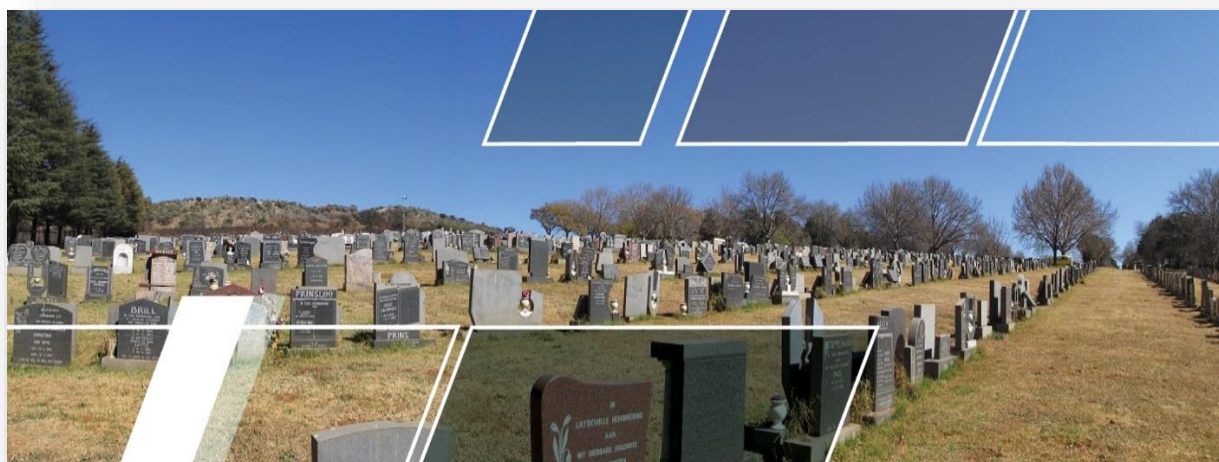
**Figure 13: Comparison of sanitation capital funding needs for low income households – MIG grant only vs estimated Costs**



#### 7.4 Recommendations

The situation for sanitation is similar to water in respect of funding availability. In both instances there are known to be sizeable challenges for bulk services, in terms of supplies, capacity and infrastructure.

## 8. Capital Cost Needs: Health - Cemeteries



### 8.1 Typical scope of infrastructure to be funded

Municipal functions related to health services include cemeteries, abattoirs, air quality monitoring stations, and water testing laboratory services. Most municipalities do not provide abattoir services anymore, and few have crematoria. In many instances where municipalities do still have abattoirs and crematoria, these functions are outsourced to the private sector. Likewise most municipalities do not have fixed air quality monitoring stations or water testing laboratories, instead opting to outsource these services. Therefore, for purposes of modelling capital funding needs for municipal health services, the focus is on cemeteries. Typical infrastructure included in cemeteries are:

- Access and internal roads and road furniture;
- Perimeter protection;
- External facilities; and
- Stores and ablution facilities.

The provision of solid waste services can also be regarded to form part of the scope of municipal health services, but has been modelled separately due to its significance.

### 8.2 Capital cost estimates for provision of cemetery infrastructure to low income households

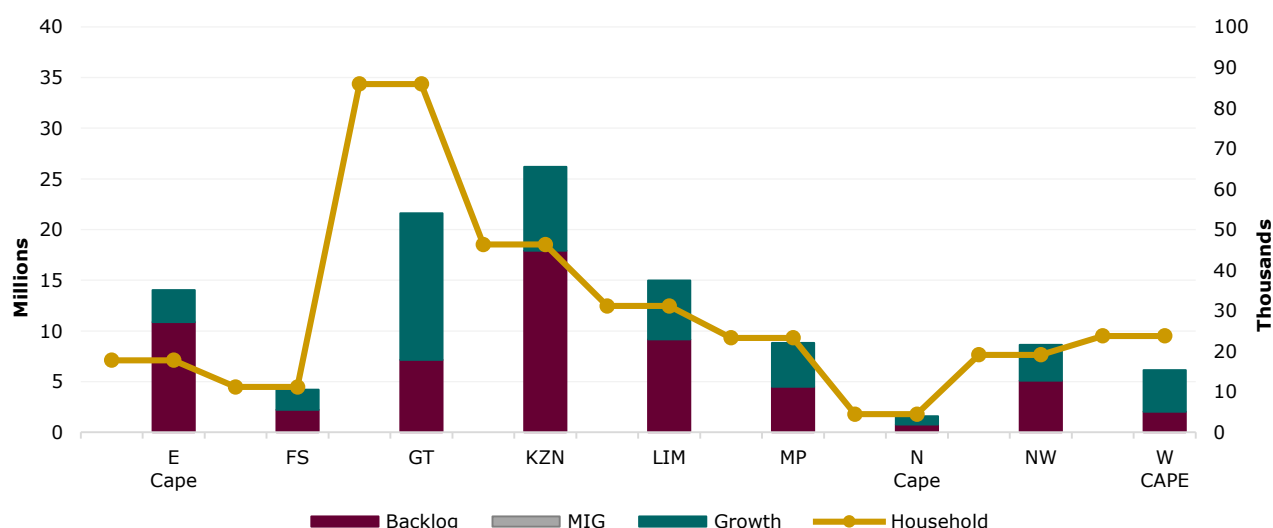
The costs to provide cemetery services have been based on a similar approach to that followed in determining the costs for other municipal infrastructure services. The CRC (current replacement cost) of infrastructure associated for cemeteries were determined for the municipalities included in the benchmark data. These costs were analysed against the household numbers, the capital expenditure and the operational expenditure of municipalities, as well as the GVA (Gross Value Added) data for the corresponding municipalities. The mortality rate will have an effect on the rate of burials and therefore the demand for burial plots, and it is considered as a cost influencing factor, and will be included as such during phase 2 of the project.

The best correlation with the known CRC values was found to be the household numbers per municipality, and this was used to develop the estimated CRC per municipality on a national basis. The estimates provide for all basic needs, and all associated costs to create the infrastructure assets. The estimated capital needs for immovable infrastructure required to serve the 'new' low income households (growth for 2016) amount to R 49.054 million overall. The estimated needs, aggregated per province, for growth in low income households are indicated in the table that follows:

**Table 20: Growth in low income households and estimated capital funding needs for cemeteries per Province**  
**2015/16**

Cemeteries	Growth	Backlog	HH Growth	Funding Need/ Poor HH
Eastern Cape	3 163 586	10 862 761	17 746	12
Free State	1 990 751	2 213 209	11 154	8
Gauteng	14 457 123	7 139 260	85 883	10
Kwazulu-Natal	8 290 858	17 895 465	46 290	16
Limpopo	5 794 046	9 177 180	31 142	14
Mpumalanga	4 332 798	4 480 102	23 288	12
Northern Cape	831 162	749 851	4 467	9
North West	3 551 349	5 074 629	19 088	12
Western Cape	4 109 651	2 016 242	23 743	8
<b>Total</b>	<b>46 521 324</b>	<b>59 608 699</b>	<b>262 801</b>	<b>12</b>

**Figure 14: Comparison – Growth and Estimated cost of CRC (Cemeteries)**



The funding for cemeteries is currently not specifically catered for under the 'P' allocation (public municipal infrastructure).

### 8.3 Recommendations

The effect on the backlogs, should 15% of the estimated backlog be addressed per sector every year, is indicated in the table below. It has been assumed that the amount invested in backlog eradication will increase at a rate equal to cost escalation, at the indicated rate and without allowing for new backlogs, the process will take approximately 8 years:

**Table 21: Investment in, and reduction of Backlogs (at 15% per annum)**

CRC Value of Access Backlog - R Million										
Year Ending	Electricity		Water		Sanitation		Cemeteries		Roads and Stormwater	
	Reduce	Remain	Reduce	Remain	Reduce	Remain	Reduce	Remain	Reduce	Remain
2015		21 158		26 948		40 001		2 341		64 483
2016	3 174	17 984	4 042	22 906	6 000	34 001	413	2 341	9 672	54 811
2017	3 365	15 705	4 286	20 003	6 363	29 692	438	2 045	10 257	47 864
2018	3 569	13 085	4 545	16 666	6 747	24 739	465	1 704	10 876	39 879
2019	3 784	10 091	4 820	12 853	7 154	19 078	493	1 314	11 533	30 755



## 9. Operating Cost Needs: Municipal Administration



### 9.1 Typical scope of municipal administration services

Municipal administration services include the basket of services referred to as General Administration, Planning and Development (GAPD), and includes:

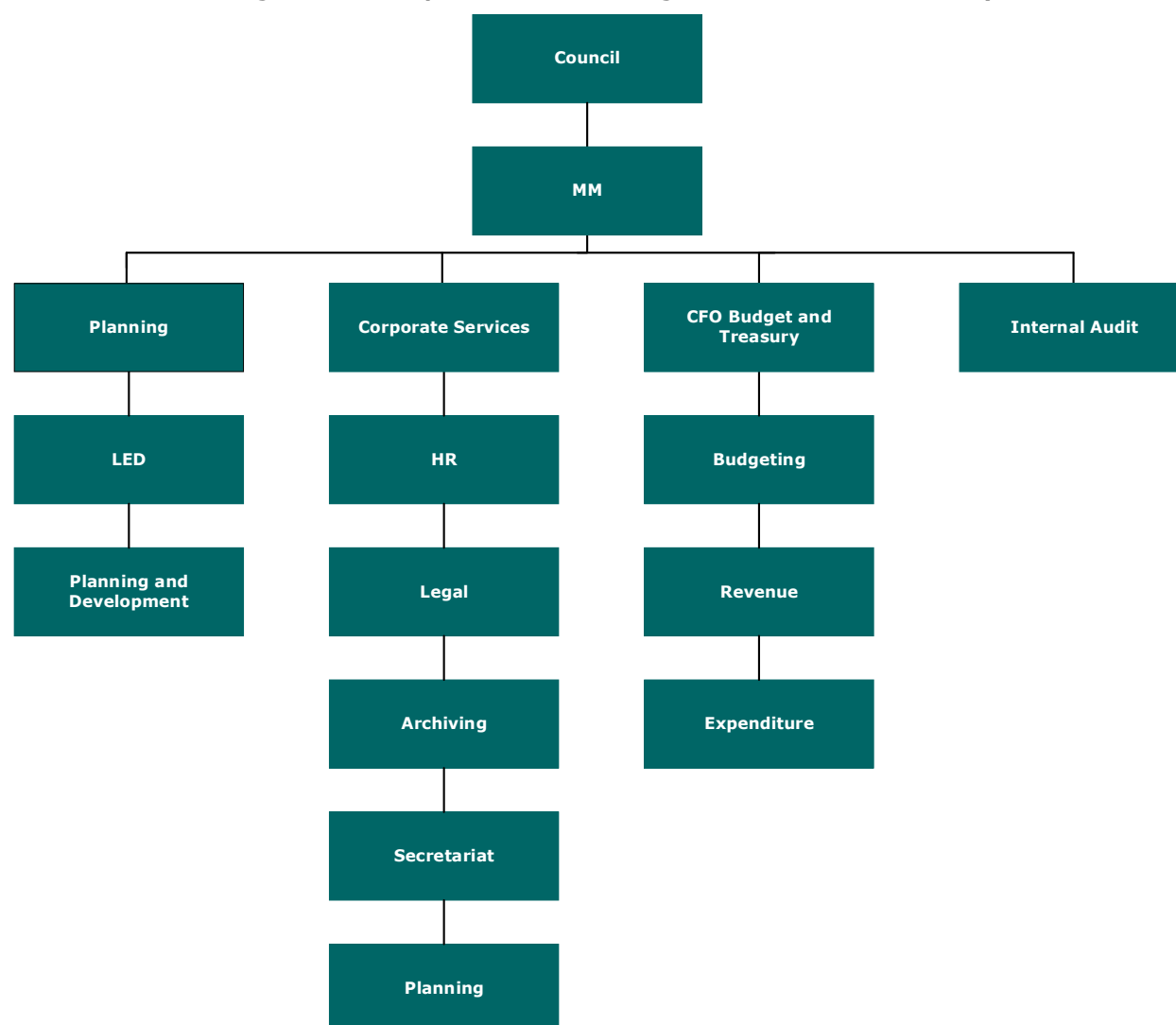
- *The costs associated with the political structure, including those cost incurred in the execution of their mandated responsibilities.* Typical examples are:
  - Councillor's remuneration;
  - Administrative support to the political structure;
  - Ward committee costs;
  - Public participation and imbizos; etc.
- *The costs associated with the overall management of the municipality, a function and responsibility assigned to the Accounting Officer through Chapter 8, Sections 60 and 61 of the Municipal Finance Management Act, No. 56 of 2003.* Typical examples are:
  - Municipal/city manager's office; and
  - Administrative support to the municipal/city manager's office;
- *The costs associated with the financial, human resource and operational management of the municipality, including the provision of support services to service delivery departments.* These costs, referred to as the cost of internal service delivery, include:
  - Budget and treasury offices, dealing with the financial administration of the municipality;
  - Human resources management;
  - Information technology;
  - Legal services;
  - Property services;
  - Planning and development; etc.

## 9.2 Approach and methodology employed to determine municipal administration operating costs

### 9.2.1 Administrative services

Municipal administrative services relates to those functions which deal with the governance of the municipality, both political and managerial. In essence, the administrative service enables the service delivery departments and can be viewed as internal service delivery. A typical municipal functional structure is illustrated in **Figure 15** below.

**Figure 15: Municipal structure reflecting *administrative functions only***



Some administrative cost are easily identifiable due to the nature of the expense, such as the remuneration of the Municipal Manager. However, service delivery expenses do not only consist of items such as bulk purchases and a significant component of operational expenses used to deliver services to the community are similar in type and nature to what is commonly referred to as overheads. Telephone, printing, stationery and salaries are but a few of the types of expenses which can relate to either municipal administration or service delivery. The grouping as illustrated in the diagram above and the association of the expense with the correct action and department, is therefore pivotal to the process of identifying the cost of administration, as the latter is often determined based on 'who' incurs the expense.



### 9.2.2 Administration expenses

In order to determine the cost of administration, the various expenditure items which will ultimately make up the totality of the administrative cost basket need to be identified. **Table 22** below identifies the various expenditure types and the respective allocation considerations that need to be made during the determination of the cost allocation.

**Table 22: Expenditure types**

Expenditure type	Allocation consideration
Councillor Remuneration	Always considered as part of the cost of governance
Section 57 Employee Cost.	Based on department allocation within the operational structure of the Municipality
Employee Related Cost	Based on department allocation within the operational structure of the Municipality
Audit Fees	Administration – Corporate overhead
Human Resource Management	Administration – Corporate overhead
ICT	Administration – Corporate overhead
Legal Fees	Administration – Corporate overhead
Marketing and Promotions	Administration – Corporate overhead
Rental of Equipment and facilities	Based on department allocation within the operational structure of the Municipality
Office overheads (General expenditure) <ul style="list-style-type: none"> <li>• Conferences and functions;</li> <li>• Licence fees;</li> <li>• Printing and stationery;</li> <li>• Subscription;</li> <li>• Telephone and communications;</li> <li>• Transport and vehicle cost</li> <li>• Travelling;</li> </ul>	Based on department allocation within the operational structure of the Municipality

It can be argued that some cost which are considered as 'corporate overheads' should be allocated to service departments based on certain cost influencing factors, such as allocating a portion of the municipal manager's salary towards each service based on the level of effort spent on those departments. However, unless a costing methodology and accurate time tracking system is implemented, such allocations will create nothing more than a false sense of accuracy. For the purposes of determining baseline administrative cost, an approach of relevance and reasonability is adopted, but more importantly, what is practical and universally applicable.

### 9.2.3 Data sources

For the purpose of developing reasonable norms to determine the administrative cost per municipality, the following data sources were used:

- Annual Financial Statements – 2013/14;
- MTREF – 2014/15 and 2015/16;
- Annual Reports for 2013/14.

In addition to the information listed above which are available in the public domain, the following municipalities were used as test sites in order to perform detailed analysis of the various expenses and cost influencing factors.

- Buffalo City Metropolitan Municipality;
- Polokwane Local Municipality;
- Hessequa Local Municipality;
- Nkangala District Municipality

Although the accounting processes are governed through the GRAP Accounting Framework, some groupings and classifications of expenditure items are not regulated and is left up to the discretion of the municipality itself, usually guided by historic practices of specific needs of various role-players at the time. This does not influence the quality of the reporting process, but does complicate the comparison of data on a one-on-one basis, especially in the case of items

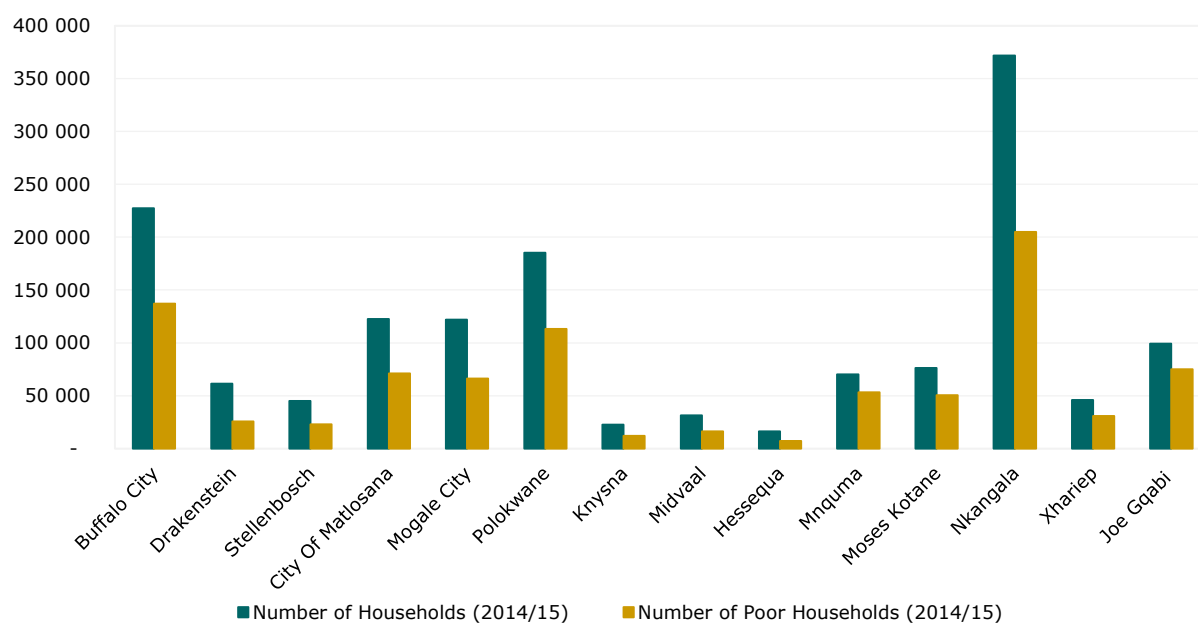
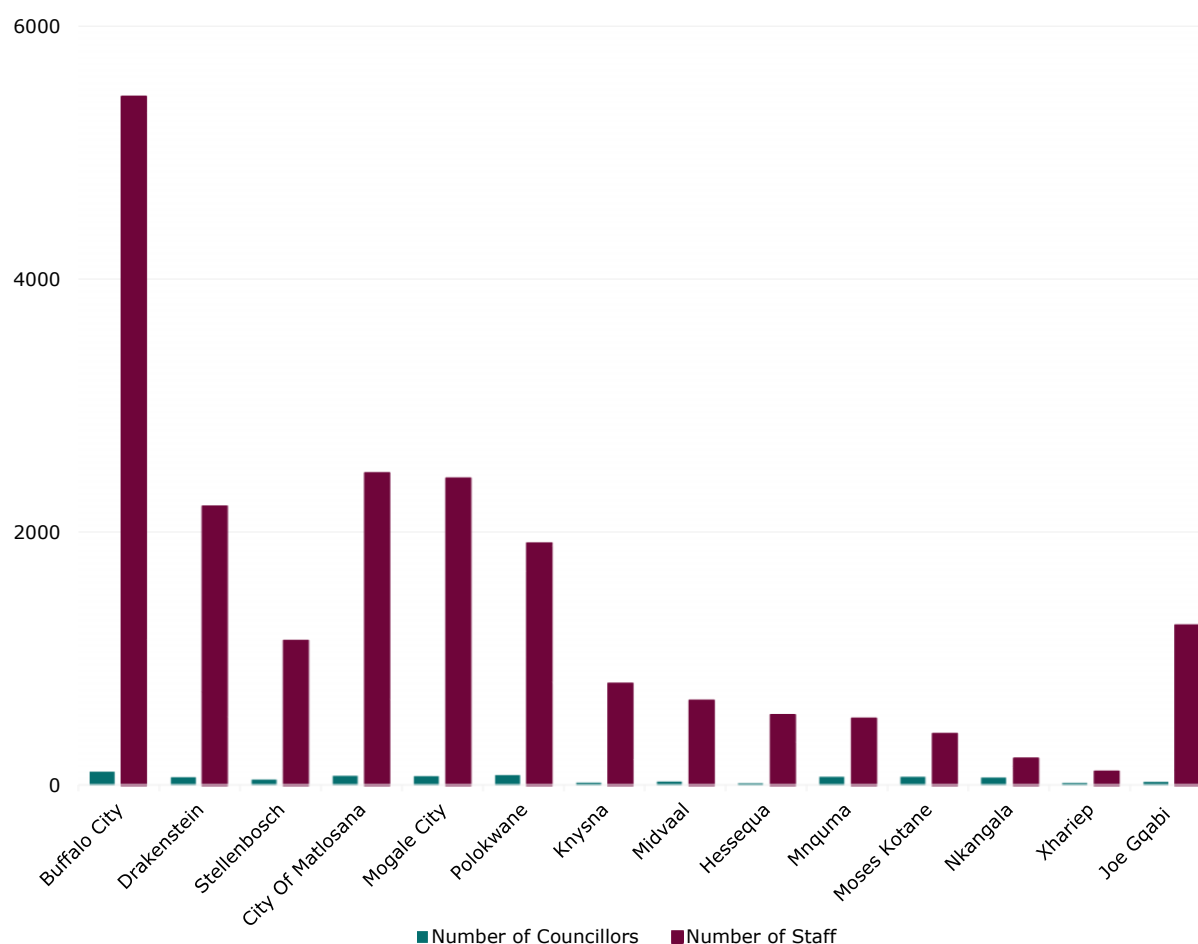
which are typically associated with administration cost. In order to bridge this challenge, the following additional municipalities were selected to aid in the standardisation of results:

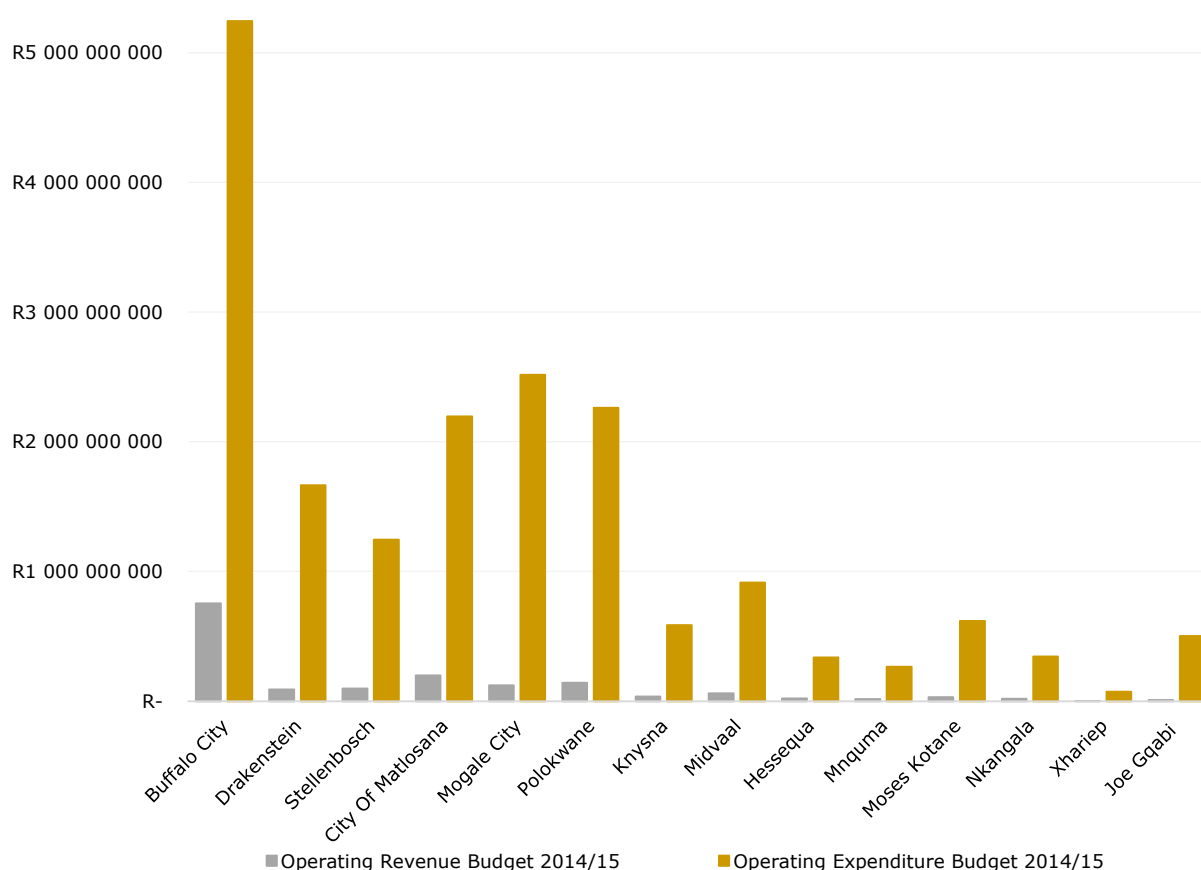
- City of Matlosana Local Municipality;
- Drakenstein Local Municipality;
- Joe Gqabi District Municipality;
- Knysna Local District Municipality;
- Midvaal Local Municipality;
- Mnquma Local Municipality;
- Mogale City Local Municipality;
- Moses Kotane Local Municipality; and
- Xhariep Local Municipality;

The test municipalities were specifically selected to represent the various categories, sizes, different socio-economic profiles and locations in order to identify commonalities which could be standardised as norms for cost determination. The following table illustrates the various differences between the municipalities:

**Table 23: Base data - Selected municipalities**

Test Data	Province	Cat	Nr of Households (2014/15)	Nr of Poor Households (2014/15)	Poor vs. total hhs.	Number of Councillors	Nr of Staff	Operating Revenue Budget 2014/15 (R'000)	Operating Expenditure Budget 2014/15 (R'000)
Buffalo City	EC	A	227 315	137 191	60,35%	100	5 440	6 009 798	5 242 997
Drakenstein	WC	B1	61 378	25 548	41,62%	61	2 204	1 666 428	1 665 850
Stellenbosch	WC	B1	45 059	23 083	51,23%	43	1 145	1 254 529	1 245 211
City Of Matlosana	NW	B1	122 662	70 990	57,87%	70	2 467	2 224 896	2 195 252
Mogale City	GAU	B1	122 115	66 385	54,36%	68	2 425	2 258 611	2 515 935
Polokwane	LIM	B1	185 357	113 199	61,07%	76	1 913	2 806 063	2 261 283
Knysna	WC	B2	22 676	12 046	53,12%	19	807	632 950	587 087
Midvaal	GAU	B2	31 507	16 239	51,54%	27	674	853 324	914 024
Hessequa	WC	B3	16 201	7 098	43,81%	15	560	350 775	336 990
Mnquma	EC	B4	70 184	53 164	75,75%	62	532	329 008	265 696
Moses Kotane	NW	B4	76 134	50 468	66,29%	62	413	697 064	619 156
Nkangala	MPU	C1	371 694	205 008	55,16%	59	218	348 336	345 412
Xhariep	FS	C1	45 874	30 797	67,14%	17	113	69 998	72 386
Joe Gqabi	FS	C2	99 323	75 010	75,52%	24	1 265	552 126	501 710

**Figure 16: Number of households – Selected municipalities****Figure 17: Number of councillors and staff – selected municipalities**

**Figure 18: Operating and expenditure budget – Selected municipalities**

#### 9.2.4 Data Analysis

The extent of the cost that could be included in administrative cost have already been discussed in Section 9.2.2 and illustrated in **Figure 18**. The various cost elements are discussed below:

**a. The costs associated with the political structure, including those costs incurred in the execution of their mandated responsibilities**

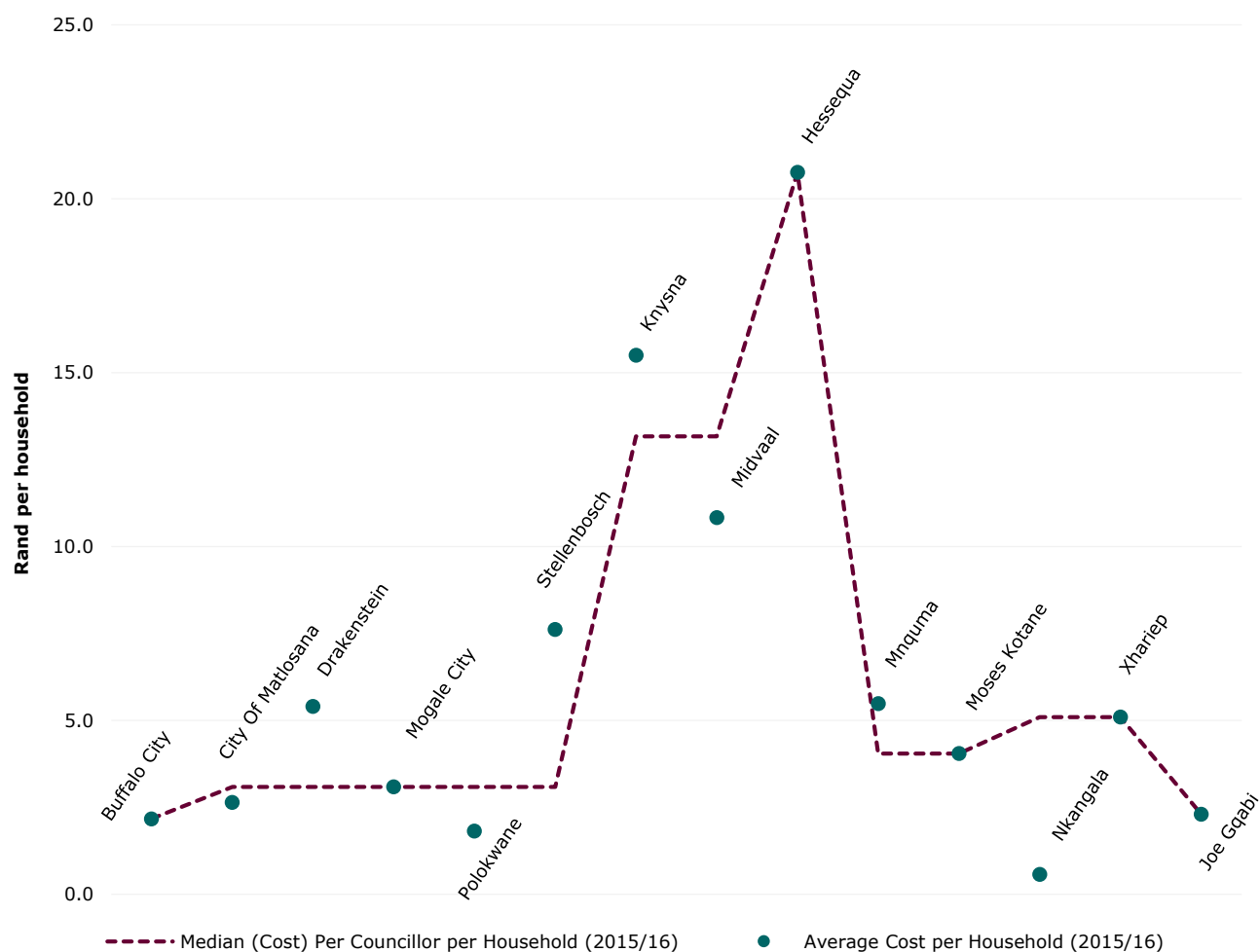
This cost is a direct product of the political structure, number of councillors, portfolio committees, etc. Accounting practice also dictates that councillor remuneration should be recognised separately, and then only to include the actual remuneration package of the Councillors and not include administrative support staff's cost. As the above has been standard practice, even before the implementation of the GRAP Accounting Framework, it is reasonable to accept that the financial information represented in the financial statements and National Treasury data base, serve as a reasonable representation of this principle.

In order to determine the reasonability of the assumption made above, the test data collected from the selected Municipalities have been measured against the entire population (all municipalities). For comparison purposes, the total cost of councillor remuneration was reduced to comparable units. Firstly, the cost (R/c) per Councillor was determined. Secondly, the cost per Councillor was further reduced to represent the cost per councillor, per household.

Table 24: Councillor remuneration – test data

Test Data	Category	Cost per Councillor (Test Data)	Cost per Household (Test Data) (2015/16)	Cost per Household (2015/16)	Total Cost - Poor Households (2014/15)	Total Cost Poor Households (2015/16)
Buffalo City	A	452 613	2,1026	2,1714	288 462	302 885
City Of Matlosana	B1	297 864	2,5643	2,6438	182 041	191 143
Drakenstein	B1	307 303	5,2871	5,4064	135 076	141 830
Mogale City	B1	354 035	3,0616	3,0898	203 242	213 404
Polokwane	B1	316 352	1,8023	1,8173	204 019	214 220
Stellenbosch	B1	321 332	7,5307	7,6197	173 832	182 524
Knysna	B2	328 417	15,2938	15,5038	184 235	193 446
Midvaal	B2	323 738	10,8504	10,8355	176 195	185 005
Hessequa	B3	309 598	20,1803	20,7581	143 233	150 395
Mnquma	B4	349 090	5,2525	5,4796	279 243	293 205
Moses Kotane	B4	281 387	3,9029	4,0474	196 970	206 819
Nkangala	C1	198 892	0,5651	0,5696	115 842	121 634
Xhariep	C1	213 218	4,9082	5,0967	151 160	158 718
Joe Gqabi	C2	209 347	2,2258	2,3007	166 955	175 302

Figure 19: Median cost per household – Test municipalities



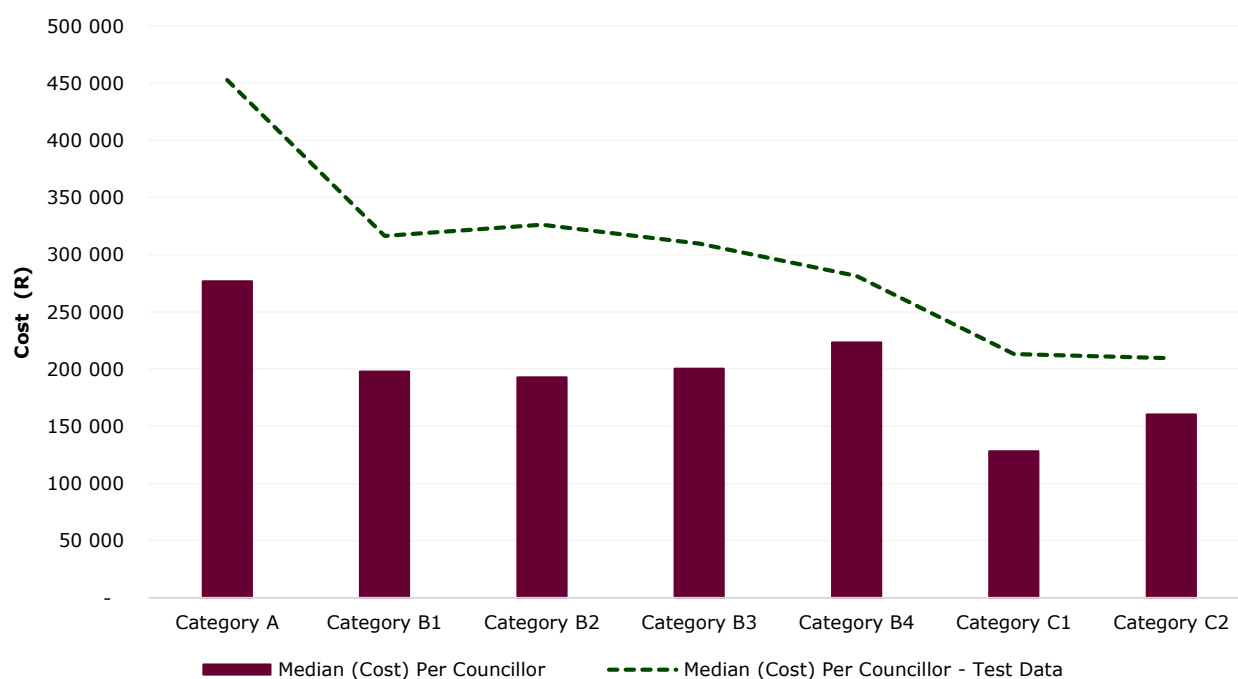
The following table presents an analysis of councillor remuneration per municipal category.

**Table 25: Councillor remuneration – per municipal category**

Municipal Category	Median (Cost) Per Councillor	Median (Cost) Per Councillor - Test Data	Variance - Cost per Councillor	Median (Cost) Per Councillor per Household (2015/16)	Median (Cost) Per Councillor per Household (2015/16) Test Data	Variance - Cost per Councillor per Household (2015/16)	Total Cost - Poor Households (2015/16)
Category A	276 779	452 613	-63,53%	0,5209	2,1714	-316,83%	2 183 087
Category B1	197 998	316 352	-59,78%	3,0898	3,0898	0,00%	3 805 924
Category B2	192 809	326 078	-69,12%	8,3647	13,1697	-57,44%	5 275 616
Category B3	200 245	309 598	-54,61%	20,0590	20,7581	-3,49%	21 742 195
Category B4	223 279	281 387	-26,02%	7,3535	4,0474	44,96%	15 692 847
Category C1	128 157	213 218	-66,37%	1,3588	5,0967	-275,10%	2 943 912
Category C2	160 420	209 347	-30,50%	1,1276	2,3007	-104,03%	3 346 658
							<b>54 990 239</b>

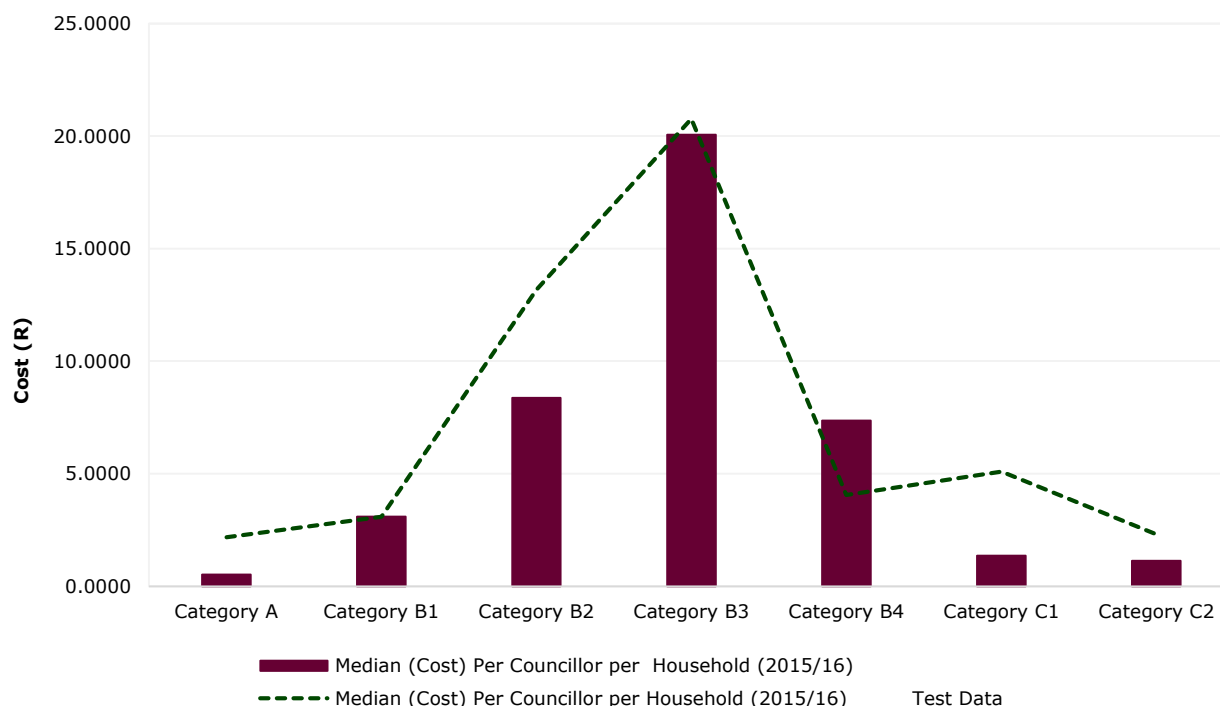
Comparing the results confirms the assumption that the number of councillors for each category of municipality determines the total councillor remuneration. This is best illustrated through the strong correlation of the test data (represented by the green line in the graph below), with the median of the cost per councillor for the entire population. Using the number of Councillors to determine the cost per household is therefore proposed as the basis for cost allocation.

**Figure 20: Cost per councillor per category of municipality**



Viewing the same data, but expressed as cost per councillor per household, reflects the impact of the difference in the number of households represented by each councillor. This is best illustrated as follows:

**Figure 21: Cost per councillor per household**



One should guard against using the cost per household as this basis for cost allocation since the fact that a Councillor in Municipality X represents a smaller number of households, does not mean that a larger allocation should be made to these households.

**b. The costs associated with the overall management of the municipality, including financial and human resource management**

As discussed under Section 9.2.2, the type of expenditure that ultimately aggregate to the totality of Administrative Cost, is mostly determined by 'who' incurs them. That nature of the accounting process and the municipal budget format is such that administrative cost is already allocated in some format to the administrative departments. However, the application of accounting practices are not 'equal' over the entire municipal population and the question remains what universal cost driver can be utilised to establish a reasonable comparison of what the administrative cost per municipality should be. In order to identify these cost influencing factors, the same group of municipalities has been used to perform a detailed study of what influences their costs and what common denominator/s exists.

**The cost elements**

As discussed under Section 9.2.2, the types of administrative cost is common amongst all municipalities. For the purposes of this discussion, inefficiencies are ignored, and analysis are performed under the assumption that all administrative processes are equally efficient. The various components of these cost elements are discussed below:

*Employee Related Cost and Section 57 Employees*

By virtue of the type of expense, employee related cost is a product of the number of employees on the payroll. The question is therefore, what determines this number. The remuneration paid to an employee is determined based on the remuneration scale per category of Municipality and the level where the employee fits into the remuneration scale. It holds true that a number of municipalities perform functions which are not mandated through Schedule 4 and 5 of the Constitution. These functions are performed out of necessity and form part of



the municipal funding requirements. The cost of these functions are already accounted for under the total Employee Related Cost, and no further adjustment for this will be required. In order to understand the total impact of these 'un-mandated' functions, a detailed analysis of each type of these functions need to be performed. The latter does not form part of the analysis performed and discussed in this report, and no further attention will be given to this component embedded within administrative cost. With the above considerations in mind, the test data was analysed with the following results:

**Table 26: Number of administrative staff per household – test data**

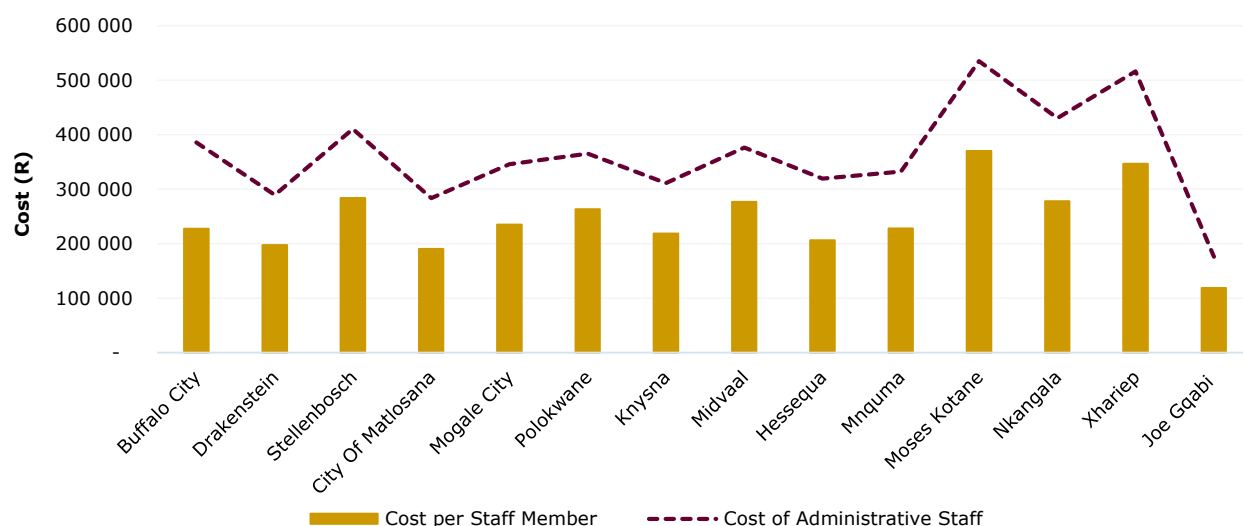
Test Data	Cat	Number of House-holds	Total Employee Related Cost (R'000)	Admin Staff Cost (R'000)	Total Number of Staff	Number of Admin Staff	Staff per House-hold	Admin staff per Household
Buffalo City	A	227 315	1 237 215	250 999	5440	651	0,0239	0,0029
Drakenstein	B1	61 378	434 516	147 435	2204	510	0,0359	0,0083
Stellenbosch	B1	45 059	324 832	113 273	1145	276	0,0254	0,0061
City Of Matlosana	B1	122 662	468 821	113 787	2467	401	0,0201	0,0033
Mogale City	B1	122 115	570 351	140 065	2425	405	0,0199	0,0033
Polokwane	B1	185 357	504 000	139 904	1913	383	0,0103	0,0021
Knysna	B2	22 676	176 163	66 579	807	214	0,0356	0,0094
Midvaal	B2	31 507	186 356	70 807	674	188	0,0214	0,0060
Hessequa	B3	16 201	115 482	41 504	560	130	0,0346	0,0080
Mnquma	B4	70 184	121 324	47 510	532	143	0,0076	0,0020
Moses Kotane	B4	76 134	152 935	96 351	413	180	0,0054	0,0024
Nkangala	C1	371 694	60 539	29 255	218	68	0,0006	0,0002
Xhariep	C1	45 874	39 164	34 064	113	66	0,0025	0,0014
Joe Gqabi	C2	99 323	149 844	22 488	1265	128	0,0127	0,0013

Following the above, a reasonable cost per administrative staff member needed to be determined. Since the exact composition of all staff within the entire population is not known, the cost per administrative staff member within the test data was determined and analysed to establish if this cost could be applied as a norm / unit rate to the rest of the municipalities. The following table and its accompanying graph illustrate the close relationship between the difference of the cost determined per staff member and that of the administrative staff.

**Table 27: Relationship between administrative staff cost and average staff cost**

Test Data	Cat	Number of House-holds	Total Employee Related Cost (R'000)	Admin Staff Cost (R'000)	Total Number of Staff	Number of Admin Staff	Cost per Staff Member	Cost of Admin Staff Member	Cost per Staff Member vs. Cost per Admin Staff Member
Buffalo City	A	227 315	1 237 215	250 999	5440	651	227 429	385 559	169,529%
Drakenstein	B1	61 378	434 516	147 435	2204	510	197 149	289 089	146,635%
Stellenbosch	B1	45 059	324 832	113 273	1145	276	283 696	410 413	144,666%
City Of Matlosana	B1	122 662	468 821	113 787	2467	401	190 037	283 758	149,317%
Mogale City	B1	122 115	570 351	140 065	2425	405	235 197	345 840	147,043%
Polokwane	B1	185 357	504 000	139 904	1913	383	263 461	365 285	138,649%
Knysna	B2	22 676	176 163	66 579	807	214	218 294	311 117	142,522%
Midvaal	B2	31 507	186 356	70 807	674	188	276 493	376 633	136,218%
Hessequa	B3	16 201	115 482	41 504	560	130	206 219	319 266	154,819%
Mnquma	B4	70 184	121 324	47 510	532	143	228 054	332 243	145,686%
Moses Kotane	B4	76 134	152 935	96 351	413	180	370 303	535 283	144,553%
Nkangala	C1	371 694	60 539	29 255	218	68	277 702	430 222	154,922%
Xhariep	C1	45 874	39 164	34 064	113	66	346 591	516 126	148,915%
Joe Gqabi	C2	99 323	149 844	22 488	1265	128	118 454	175 693	148,322%

Figure 22: Relationship between the administrative staff cost and average staff cost



Based on this close relationship illustrated through the test data, it is reasonable to assume that this relationship will also exist within the rest of the population. The median of the cost per administrative staff member will therefore be used to model the cost associated with administrative staff for all municipalities. The following tables illustrate the results after applying this 'unit rate' for administrative staff cost:

Table 28: Total cost of administrative staff per low income household – per category of municipality

Category	Households 2015/16	Poor Households (<R2 300) (2015/16)	Administrative Staff per Household	Unit Cost per Administrative Staff member	Number of Administrative Staff Required to serve Poor Households	Cost Administrative Staff Required to serve Poor Households
Category A	6 616 040	3 315 518	0,0029	385 559	18 947	7 305 357 590
Category B1	2 304 106	1 265 019	0,0033	345 840	7 642	2 642 797 504
Category B2	1 240 192	729 035	0,0077	343 875	9 552	3 284 674 547
Category B3	1 986 197	1 263 646	0,0080	319 266	15 938	5 088 439 077
Category B4	3 174 300	2 374 554	0,0022	433 763	6 986	3 030 363 112
Category C1	4 342 707	2 537 943	0,0008	473 174	3 521	1 666 154 978
Category C2	4 362 089	3 094 312	0,0013	175 693	5 622	987 659 844
						<b>24 005 446 651</b>

Table 29: Total cost of administrative staff serving low income households – per province

Province	Households 2015/16	Poor Households (<R2 300) (2015/16)	Administrative Staff per Household	Unit Cost per Administrative Staff member	Number of Administrative Staff Required to serve Poor Households	Cost Administrative Staff Required to serve Poor Households
Eastern Cape	2 906 414	2 055 693	0,0049	349 486	8 536	2 860 059 989
Free State	1 469 734	929 431	0,0064	351 863	5 474	1 907 919 811
Gauteng	4 830 153	2 444 134	0,0046	374 123	13 897	5 273 188 403
Kwazulu Natal	4 295 324	2 776 967	0,0039	353 100	12 031	4 003 727 556
Limpopo	3 008 525	2 125 789	0,0036	368 024	6 840	2 262 727 630
Mpumalanga	2 302 878	1 415 669	0,0047	375 919	5 403	2 031 044 947
North West	2 244 676	1 388 483	0,0047	350 747	5 969	2 060 236 885
Northern Cape	633 608	357 736	0,0066	348 491	2 354	807 454 914
Western Cape	2 334 319	1 086 126	0,0061	354 706	7 704	2 799 086 515
						<b>24 005 446 651</b>

### Audit Fees

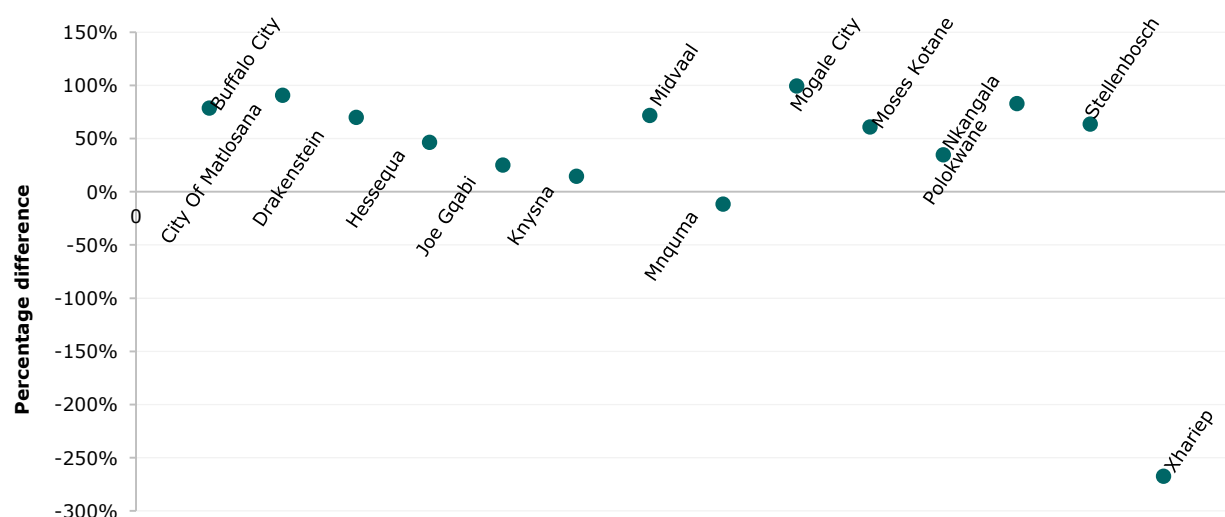
Audit fees are determined by the Auditor General on a basis of time-and-cost associated with performing the audit. This in turn is a product of the volume of audit work that need to be performed in order to formulate an opinion of the total population under the audit scope. This volume of audit work is based on the value of transactions and the associated risk that a single transaction, on its own or in combination with other transactions, may change the opinion on the accuracy or completeness of the entire population. Various factors influence this risk, of which internal efficiencies and control are just samples. Value of transactions, or in this case the Expenditure or Revenue Budget, Value of Property Plant and Equipment, etc. could be used to formulate an universal measurement, but efficiencies cannot be gauged on that basis.

The Audit outcome could also be considered, but numerous municipalities have fairly 'large' Audit fees, yet still receive Unqualified or Clean audits, while the Audit Reports of other municipalities with fairly "small" audit fees reflect qualifications. The following graph illustrates the variance of audit cost, if a common factor of 1% of the total spending during a year is used to determine the audit fee. (Note that audit teams adopt an approach where 1% of the spending is used as the 'starting point' to determine the extent of the audit work. This 1% is then adjusted upwards or downwards through a complex mechanism of risk assessments, which cannot be pre-determined and which requires an annual risk assessment.)

**Table 30: Comparison between actual and 1% projection on audit fees**

Test Data	Province	Cat	Number of Households (2014/15)	Actual Audit Fees (2013/2014)	Audit Fee per Household	Calculated Audit Fee @ 1%	Difference (1% vs. Actual)
Buffalo City	EC	A	227 315	11 692 400	51	54 700 136	79%
Drakenstein	WC	B1	61 378	5 447 663	89	18 084 091	70%
Stellenbosch	WC	B1	45 059	4 753 380	105	13 018 536	63%
City Of Matlosana	NW	B1	122 662	2 021 883	16	21 257 742	90%
Mogale City	GAU	B1	122 115	215 530	2	26 593 117	99%
Polokwane	LIM	B1	185 357	4 897 935	26	28 383 354	83%
Knysna	WC	B2	22 676	5 415 766	239	6 342 014	15%
Midvaal	GAU	B2	31 507	2 140 825	68	7 573 737	72%
Hessequa	WC	B3	16 201	2 098 988	130	3 923 703	47%
Mnquma	EC	B4	70 184	2 964 222	42	2 650 490	-12%
Moses Kotane	NW	B4	76 134	2 445 503	32	6 227 551	61%
Nkangala	MPU	C1	371 694	2 946 563	8	4 517 461	35%
Xhariep	FS	C1	45 874	2 269 611	49	617 899	-267%
Joe Gqabi	FS	C2	99 323	4 770 494	48	6 362 241	25%

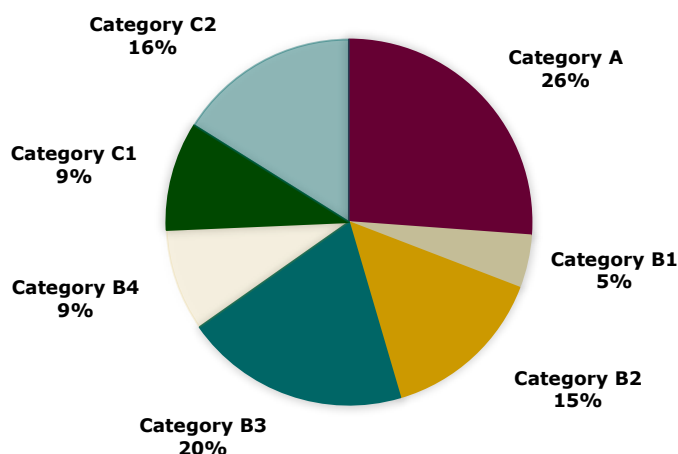
**Figure 23: Audit fee – Comparison between actual and 1% projection**



The significant variance between the actual audit fee and the 1% projection is clear from both the graph as well as the table above. Based on the distribution of the variance, this will hold true for any fixed percentage used in the calculation. As an alternative, it is proposed that a norm / unit rate, based on the audit cost expressed as a cost per household, be established through the test municipal data and extrapolated over the rest of the municipalities. The result of the proposed methodology is depicted in below.

**Table 31: Distribution of proposed audit fee projection – per category**

Category	Audit Fee per category of municipality (R)
Category A	340 308 669
Category B1	60 884 517
Category B2	190 230 038
Category B3	257 334 940
Category B4	118 013 757
Category C1	124 641 080
Category C2	209 510 765



*Administrative cost determined by the number of staff*

The number of staff, which is a product of the functions and the size of the municipality, has a direct impact on the majority of administrative cost components. For the purposes of this discussion, the following cost elements are considered:

- Conferences and functions;
- Human resource management;
- ICT;
- Licence fees;
- Marketing and Promotions;
- Printing and Stationery;
- Subscription;
- Telephone and communications;
- Transport and vehicle cost; and
- Travelling;

The cost elements listed above represent the majority of the type of administrative expenditure that is incurred a daily basis. Each one of these expenditure items is a product of the number of staff members that function within the municipality. As mentioned earlier, it is possible to argue that factors such as the nature and levels of service, size of the municipality, etc. determine the staff compliment, but each one of these influencing factors culminate in the number of people incurring the expense. However, before an allocation can be made based on the number of staff within the municipality, it needs to be established what component of each of these expenditure items actually relate to administrative cost. In order to identify this, these expenditure items have been analysed for each of the test municipalities, and the following allocation between indirect service delivery cost and administration cost have been identified.

**Table 32: Allocation of administration cost**

Test Data	Category	Number of Councillors	Number of Staff	Basket of Admin Expenses (2015/16)	% Utilised within Admin	Admin Component	Admin Cost per Staff Member
Buffalo City	A	100	5440	921 273 430	58,90%	542 630 050	97 948
Drakenstein	B1	61	2204	207 812 421	67,20%	139 649 947	61 656
Stellenbosch	B1	43	1145	181 775 223	61,90%	112 518 863	94 713
City Of Matlosana	B1	70	2467	186 461 927	71,30%	132 947 354	52 403
Mogale City	B1	68	2425	167 875 416	69,09%	115 985 125	46 524
Polokwane	B1	76	1913	342 114 236	52,09%	178 207 305	89 596
Knysna	B2	19	807	112 581 313	75,50%	84 998 891	102 904
Midvaal	B2	27	674	56 623 136	75,50%	42 750 468	60 985
Hessequa	B3	15	560	41 198 329	74,18%	30 560 920	53 149
Mnquma	B4	62	532	81 564 806	79,20%	64 599 326	108 753
Moses Kotane	B4	62	413	103 364 782	76,60%	79 177 423	166 689
Nkangala	C1	59	218	32 967 622	72,50%	23 901 526	86 287
Xhariep	C1	17	113	18 459 484	86,90%	16 041 292	123 395
Joe Gqabi	C2	24	1265	60 454 864	88,48%	53 490 464	41 498

Applying the above norms to the rest of the population, the basket of administrative costs is allocated to the various municipalities and summarised per category and province as follows:

**Table 33: Allocation of administration basket of cost – per category of municipality**

Category	% Utilised within Administration	Median of Administrative Cost per Staff Member	Administrative Component	Administrative Cost Component - Poor Household
Category A	58,90%	97 948	14 531 711 106	7 284 413 126
Category B1	67,20%	61 656	3 357 517 662	1 826 575 677
Category B2	75,50%	81 945	2 317 229 435	1 320 757 063
Category B3	74,18%	53 149	2 142 506 542	1 322 331 821
Category B4	77,90%	137 721	2 835 403 920	2 121 848 692
Category C1	79,70%	104 841	787 144 907	438 501 453
Category C2	88,48%	41 498	729 570 089	523 649 256
			<b>26 701 083 662</b>	<b>14 838 077 087</b>

**Table 34: Allocation of administration basket of cost – per province**

Province	Administrative Component	Administrative Component for Poor Households
Eastern Cape	3 905 616 560	1 784 131 367
Free State	701 096 284	377 505 435
Gauteng	2 710 689 169	1 774 932 198
Kwazulu Natal	1 597 900 233	961 148 855
Limpopo	4 749 558 326	2 848 893 728
Mpumalanga	1 294 601 291	800 732 525
North West	1 511 927 544	1 070 763 347
Northern Cape	1 382 783 293	814 566 315
Western Cape	8 846 910 962	4 405 403 317
<b>26 701 083 662</b>		<b>14 838 077 087</b>

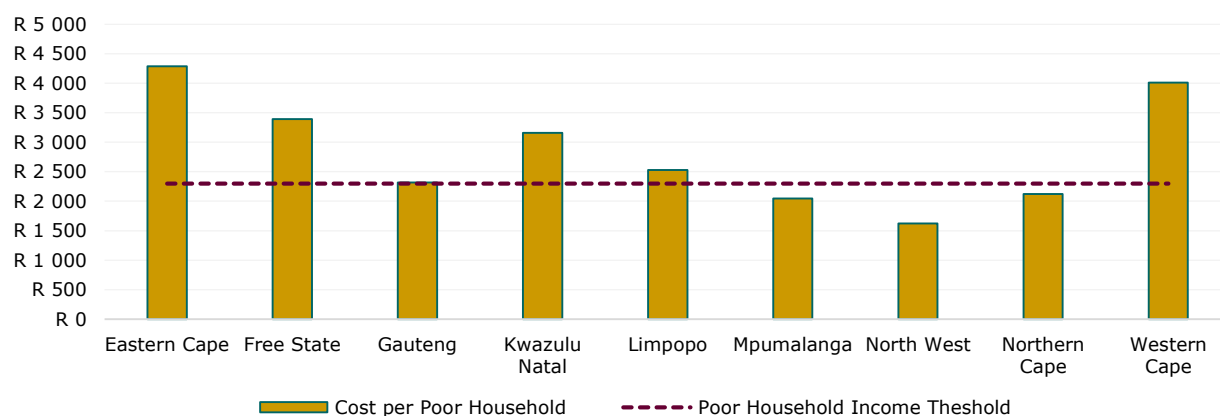
### 9.3 Operating cost estimates for provision of municipal administration services to low income households

The following tables and graphs summarise the combined costs of municipal administration services, estimated at some R 39 688 million per annum, to low income households, first per province, and then by category of municipality.

**Table 35: Summarised cost of municipal administration services benefiting low income households – per province**

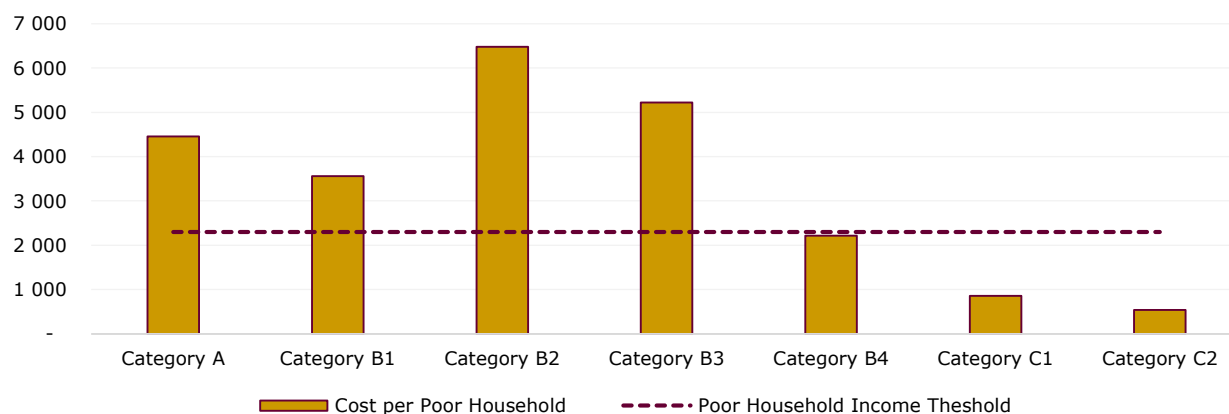
Province	Number of Poor Households (2014/15)	Administrative Cost Component Attributable to Poor Households	Clr Remuneration	Employee Related Cost	Audit Fees	Administrative Basket of Services	Cost/ low income hh
EC	854 505	4 654 944 366	5 445 238	2 799 086 515	66 281 246	1 784 131 367	4 286
FS	521 195	1 213 611 277	5 003 852	807 454 914	23 647 076	377 505 435	3 392
GAU	2 037 619	4 768 575 706	9 871 200	2 860 059 989	123 712 320	1 774 932 198	2 320
KZN	1 631 433	2 937 936 931	4 914 367	1 907 919 811	63 953 898	961 148 855	3 161
LIM	1 032 486	7 022 298 965	12 219 150	4 003 727 556	157 458 531	2 848 893 728	2 529
MPU	685 131	2 894 207 322	3 835 597	2 031 044 947	58 594 253	800 732 525	2 044
NW	174 651	3 443 042 531	6 327 807	2 262 727 630	103 223 747	1 070 763 347	1 620
NC	676 505	2 947 206 608	4 892 120	2 060 236 885	67 511 287	814 566 315	2 123
WC	769 634	9 805 945 140	2 480 907	5 273 188 403	124 872 512	4 405 403 317	4 012
		<b>39 687 768 847</b>	<b>54 990 239</b>	<b>24 005 446 651</b>	<b>789 254 869</b>	<b>14 838 077 087</b>	

**Figure 24: Identified administrative cost to be component attributable to low income households– per province**



**Table 36: Identified administrative cost to be component attributable to poor households – per category**

Category	Number of Poor Households (2014/15)	Administrative Cost Component Attributable to Poor Households	Councillor Remuneration	Employee Related Cost	Audit Fees	Administrative Basket of Services	Cost per Poor Household
Category A	3 315 518	14 762 493 835	2 183 087	7 305 357 590	170 540 032	7 284 413 126	4 453
Category B1	1 265 019	4 506 606 426	3 805 924	2 642 797 504	33 427 321	1 826 575 677	3 562
Category B2	729 035	4 722 532 197	5 275 616	3 284 674 547	111 824 972	1 320 757 063	6 478
Category B3	1 263 646	6 596 233 060	21 742 195	5 088 439 077	163 719 967	1 322 331 821	5 220
Category B4	2 374 554	5 256 185 558	15 692 847	3 030 363 112	88 280 908	2 121 848 692	2 214
Category C1	2 537 943	2 180 442 451	2 943 912	1 666 154 978	72 842 107	438 501 453	859
Category C2	3 094 312	1 663 275 319	3 346 658	987 659 844	148 619 562	523 649 256	538
		<b>39 687 768 847</b>	<b>54 990 239</b>	<b>24 005 446 651</b>	<b>789 254 869</b>	<b>14 838 077 087</b>	

**Figure 25: Identified administrative cost to be component attributable to poor households – per category**

Considering the administrative component per poor household, it is noticeable that the allocation is significantly lower under the District Municipality category. With Employee Related cost being the largest contributor (R24 billion), followed by the contribution determined through the analysis of what has been grouped together as the 'Administrative Basket of Services' (R14 million), the significant lower administrative cost component under the District Municipality Category is supported by the fact that staff numbers is the main cost influencing factor of both these components. It should be noted that the administrative cost component could be refined through detailed analysis of a larger selection of test municipalities, based on data available and interactions with representatives of these municipalities. The analysis is however still dependent on the accuracy of base-line information, and the representation of this data.



## 10. Operating Cost Needs: Municipal Health Services



### 10.1 Typical scope of municipal health services

The National Health Act, Act 61 of 2003, defines municipal health services as follows:

“municipal health services”, for the purposes of this Act, includes-

- water quality monitoring;
- food control;
- waste management;
- health surveillance of premises;
- surveillance and prevention of communicable diseases, excluding immunisations;
- vector control;
- environmental pollution control;
- disposal of the dead; and
- chemical safety,

This description include the following services that require infrastructure assets to enable municipalities to be perform the functions:

- Cemeteries - item (h)
- Solid waste services – item (c)

The services above are included in the proposed Model. Water quality monitoring has been excluded as it is included in the water services rendered by municipalities, to the varying extent that municipalities provide in-house or contracted services to test water quality.

## 10.2 Operating cost estimates for provision of municipal health services to low income households

Cemeteries are facilities provided to the communities on a basis where it is mostly difficult or impossible to provide such services in a ring-fenced manner, or determine the costs to the poor accurately. Those cemeteries that only serve low income households, such as in the rural villages would be the exception, where this would be possible. Costs have therefore been determined utilising the tried methodology where the appropriate proportional cost relative to the replacement value of the infrastructure used to provide the service, is used to calculate the annual operating cost. Different approaches to infrastructure investment, and the impacts on operations and maintenance were also considered with two scenarios used to determine the impact of improved asset management on costs, as follows:

- **Model A: Asset sweating** – continuation of current investment approach: investment in new asset creation and neglect of current infrastructure
- **Model B: Responsible asset custodianship and investment aligned to growth** – investment in new assets linked to population growth, and adequate provision for infrastructure renewal

**Table 37** contains the cost estimates for the operating cost associated with low income households in terms of Scenario A, with a total value of R 124 million per annum required for 2015/16. The estimated costs have been aggregated at provincial level:

**Table 37: Operations, maintenance and depreciation costs for cemeteries per province - 2015/16 (Scenario A)**  
(HH and Rand in Thousands)

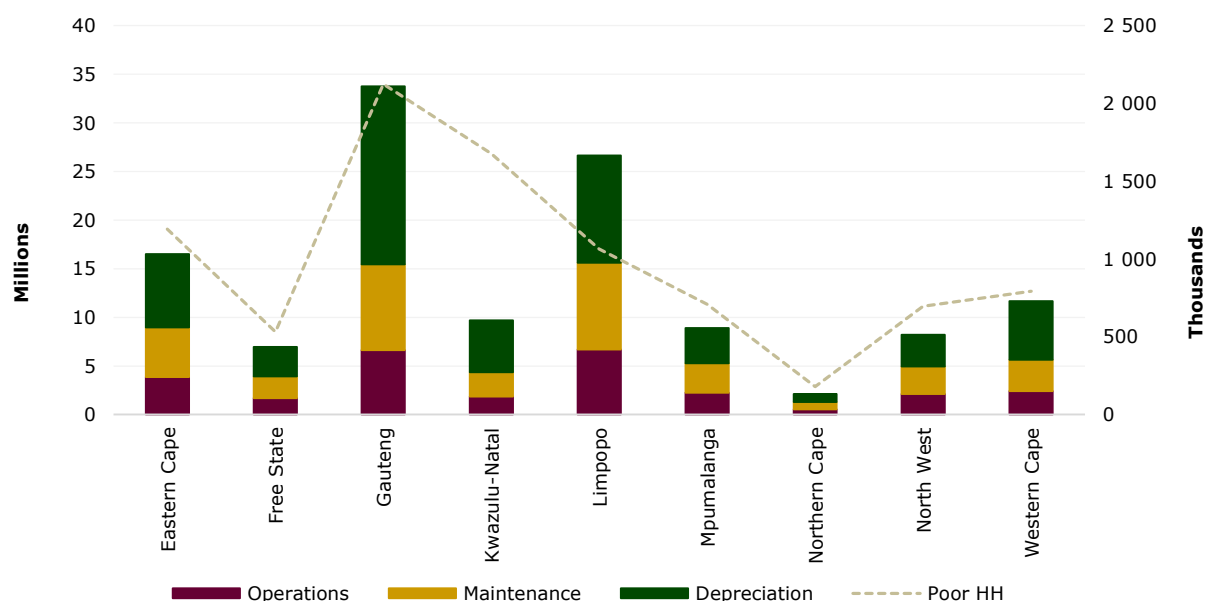
Province	Poor HH	Operations	Maintenance	Depreciation	Total Cost
Eastern Cape	1 192	3 858	5 122	7 518	16 498
Free State	532	1 689	2 244	3 013	6 946
Gauteng	2 124	6 617	8 838	18 287	33 742
Kwazulu-Natal	1 678	1 863	2 483	5 356	9 702
Limpopo	1 064	6 707	8 902	11 039	26 648
Mpumalanga	708	2 265	3 007	3 628	8 900
Northern Cape	179	553	736	822	2 111
North West	696	2 133	2 833	3 253	8 219
Western Cape	793	2 418	3 235	6 018	11 671
<b>Total</b>	<b>8 966</b>	<b>28 104</b>	<b>37 399</b>	<b>58 935</b>	<b>124 437</b>

**Table 38: Operations, maintenance and depreciation costs for cemeteries per province - 2015/16 (Scenario B)**  
(HH and Rand in Thousands)

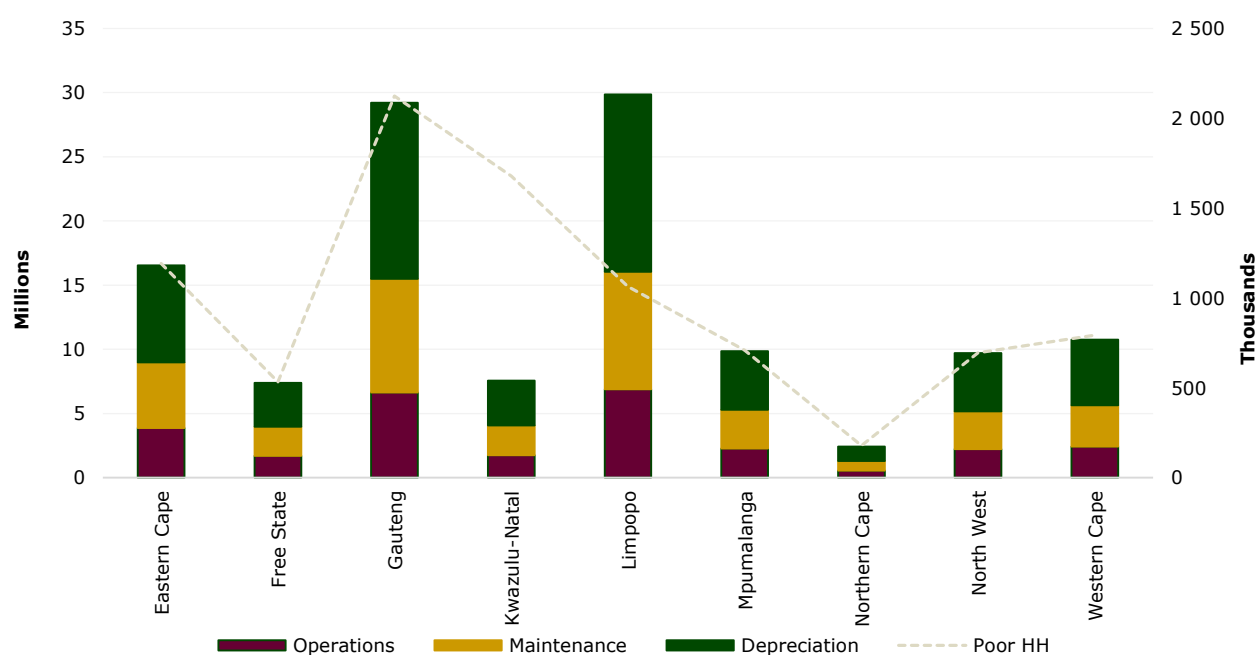
Province	Poor HH	Operations	Maintenance	Depreciation	Total Cost
Eastern Cape	1 192	3 863	5 128	7 548	16 539
Free State	532	1 704	2 263	3 414	7 380
Gauteng	2 124	6 637	8 864	13 709	29 211
Kwazulu-Natal	1 678	1 746	2 327	3 476	7 550
Limpopo	1 064	6 894	9 150	13 806	29 851
Mpumalanga	708	2 268	3 011	4 585	9 864
Northern Cape	179	553	736	1 146	2 434
North West	696	2 218	2 946	4 529	9 692
Western Cape	793	2 417	3 233	5 112	10 761
<b>Total</b>	<b>8 966</b>	<b>28 300</b>	<b>37 658</b>	<b>57 325</b>	<b>123 283</b>

Comparison between the results in terms of Scenario A and Scenario B shows little difference in 2015/16. The estimated costs as indicated in the tables above are presented graphically below:

**Figure 26: Estimated cemeteries' operation, maintenance and depreciation costs – Scenario A**



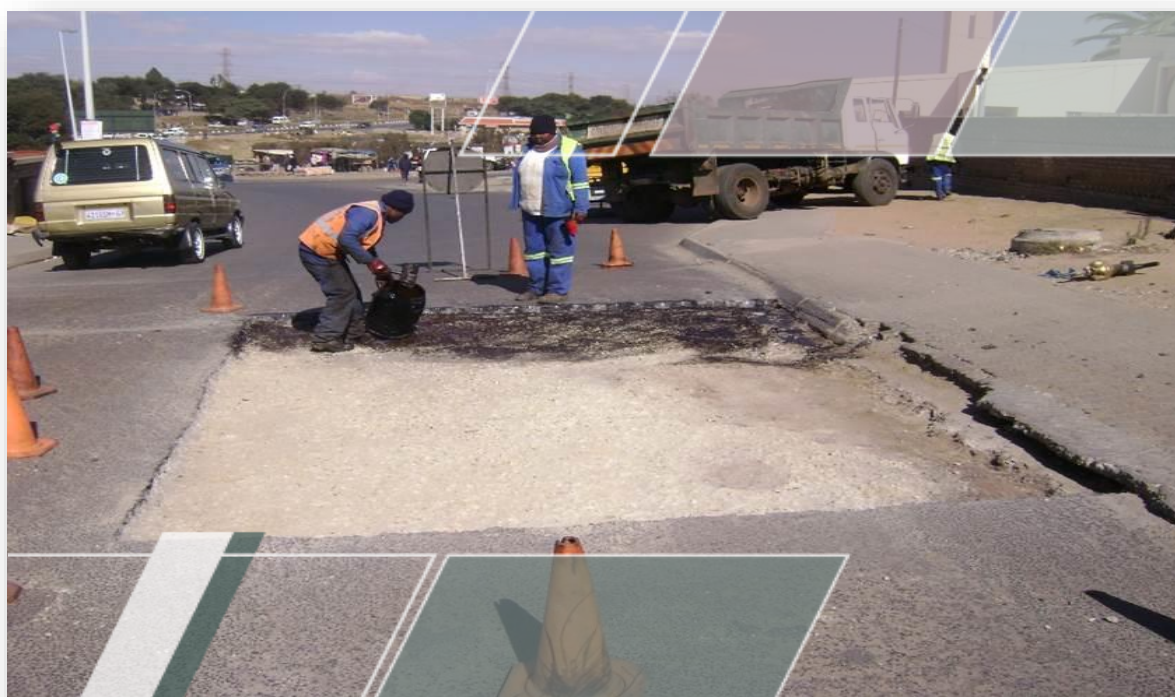
**Figure 27: Estimated cemeteries' operation, maintenance and depreciation costs – Scenario B**



### 10.3 Recommendations

Operating and maintenance costs for cemetery services are relatively low compared to the costs for other services. To avoid adding to the total quantum of infrastructure and other grants, and since cemeteries are often managed by the same departments responsible for Parks and or Sports, consideration should be given to allocating a proportional amount from the grant allocated to sports facilities, to cemeteries.

## 11. Operating Cost Needs: Municipal Roads and Stormwater



### 11.1 Typical scope of municipal roads and stormwater operating and maintenance cost activities

Operating and maintenance of roads and stormwater includes a multitude of activities not limited to physical maintenance repairs and operations (that includes preventative and reactive activities). Additionally, it also includes strategic and planning activities. All of the activities form part of the integrated asset management of the infrastructure, and include functions such as the development of asset management plans, integrated transport plan development, and interaction with stakeholders ranging from provincial transport authorities, taxi associations etc. Regular monitoring of roads and stormwater condition (and of all associated infrastructure) is required, as well as the development and maintenance of asset registers. Periodic detailed PMS (pavement management system) assessments are required, and associated studies, such as pavement analysis, traffic surveys and traffic counts. The most significant cost elements or drivers are listed below:

- Pot-hole repair, crack sealing and edge repairs
- Maintaining kerbs, kerb inlets, man-holes and structures;
- Bridge maintenance
- Surface enrichment;
- Road condition assessment;
- Maintenance of road furniture, marking of roads;
- Stormwater maintenance and cleaning;
- Cleaning of kerb inlets; and
- Pot-hole repair, crack sealing and edge repairs

Road surface maintenance is normally the most significant maintenance activity on paved roads, accounting for the largest investment in terms of resources. The age and condition of roads have direct influence, and renewal backlogs can result in a severe escalation in the required maintenance.

Maintenance backlogs rapidly leads to irretrievable damage to the road structural layers, reduced life of the infrastructure with increased life cycle cost and reduced service standards, and if not addressed, may result in roads having to be re-built. Following is a brief analysis of the nature of operations and maintenance activities:

- *Repairing kerbs, kerb inlets, man-holes and structures*  
Damage to kerbs, as well as kerb inlets, storm water manholes and other road structures through wear and tear, accidents, vehicles driving over kerb inlets etc. need to be repaired to ensure functionality is maintained and to ensure the safety of road users and the public in general
- *Bridge maintenance*  
Bridges and engineering structures (e.g. erosion protection and retaining structures) require specialised management and maintenance to prevent damage or losses and the endangerment of life and property
- *Surface enrichment*  
Bitumen surfaces become brittle over time as a result of oxidation of the binder, and bitumen enrichment is required to prevent the loss of aggregate and reduced functionality and life of the road surface
- *Road condition assessment*  
Assessment of roads and associated infrastructure is essential for budgeting and planning, as well as for the planning of maintenance (and renewal) work, and to ensure the safety of road users
- *Maintenance of road furniture, marking of roads*  
Road furniture includes signage (regulatory and information), traffic lights, guard rails, road markings etc. Regular maintenance is essential, and response for infrastructure such as traffic lights need to be rapid in order to ensure mobility and safety for road users
- *Stormwater maintenance and cleaning*  
Operations of stormwater system includes inspection and monitoring of pipes and culverts (also CCTV inspections), channels, discharge points for damage, siltation and blockages. The responses include unblocking, rodding, repairs to pipes, channels and man-holes, cleaning of screens and removal of debris
- *Cleaning of kerb inlets*  
Kerb inlets need to be cleaned of litter, leaves and sand or gravel on a routine planned basis, and in response to blockages to ensure the correct functioning of the storm water system, and prevent flooding of the roads and property.

## **11.2 Operating cost estimates for provision of municipal roads and stormwater services to low income households**

In addition to preventative and reactive maintenance and operations, activities and expenditure include planning, traffic management, engineering reviews and assessments, maintenance of the asset register/s, financial planning, budgeting and the various other activities required to actively and effectively implement life cycle asset management.

For the purposes of determining baseline operations and maintenance cost, eight (8) municipalities were selected as test sites and the actual cost incurred to provide this service was analysed, interpreted and calibrated to represent the typical operations and maintenance needs in the provision of roads and stormwater services to low income households. The methodology applied and the ensuing results are further discussed below.

### **11.2.1 Data sources**

For the purpose of developing reasonable norms to determine the operations and maintenance cost per municipality, the following data sources were used:

- Annual Financial Statements – 2013/14;
- MTREF – 2014/15 and 2015/16; and
- Annual Reports for 2013/14.

In addition to the information listed above which are available in the public domain, additional information was obtained through municipal officials and existing data sets to clarify information and to provide insight into the key elements that influence these costs. The test sites utilised in this study are:

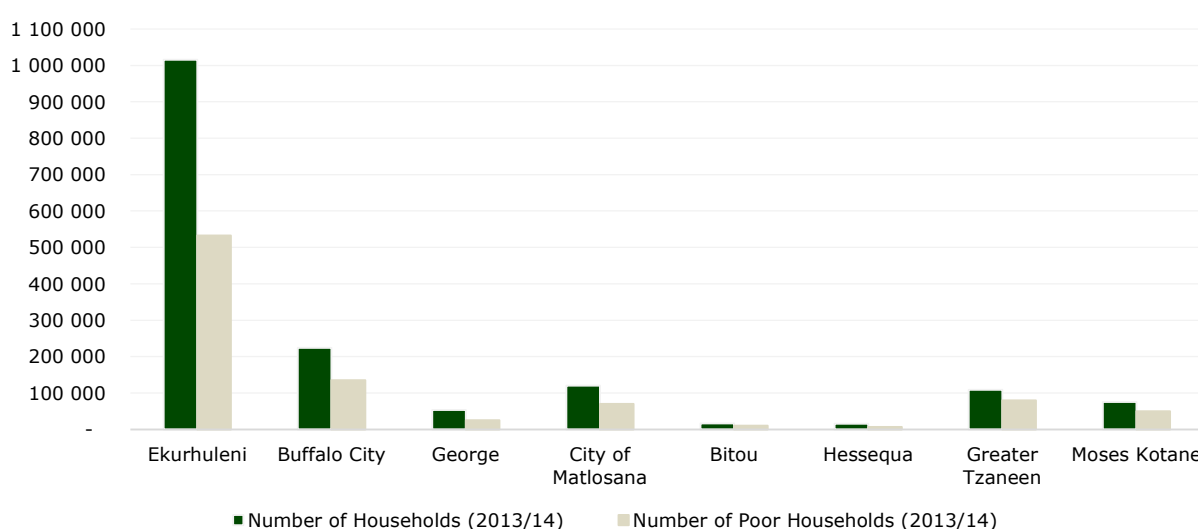
- Bitou Local Municipality;
- Buffalo City Metropolitan Municipality;
- City of Matlosana Local Municipality;
- Ekurhuleni Metropolitan Municipality;;
- George Local Municipality
- Greater Tzaneen Local Municipality;
- Hessequa Local Municipality;
- Moses Kotane Local Municipality.

The most significant challenge in establishing a baseline cost for the provision of roads and stormwater services, is the number and variability of cost influencing factors. Factors such as the geographical distribution of households, extent of gravel and paved roads and standard of roads available to each community, availability and quality of resources such as a local quarry, rainfall, etc, have a significant impact on the operations and maintenance cost. To bridge this challenge, test municipalities were selected based on the availability of information and knowledge of these conditions, or as a minimum, access to officials within these municipalities to assist in understanding and interpreting these factors. The following table illustrates the various differences between these municipalities:

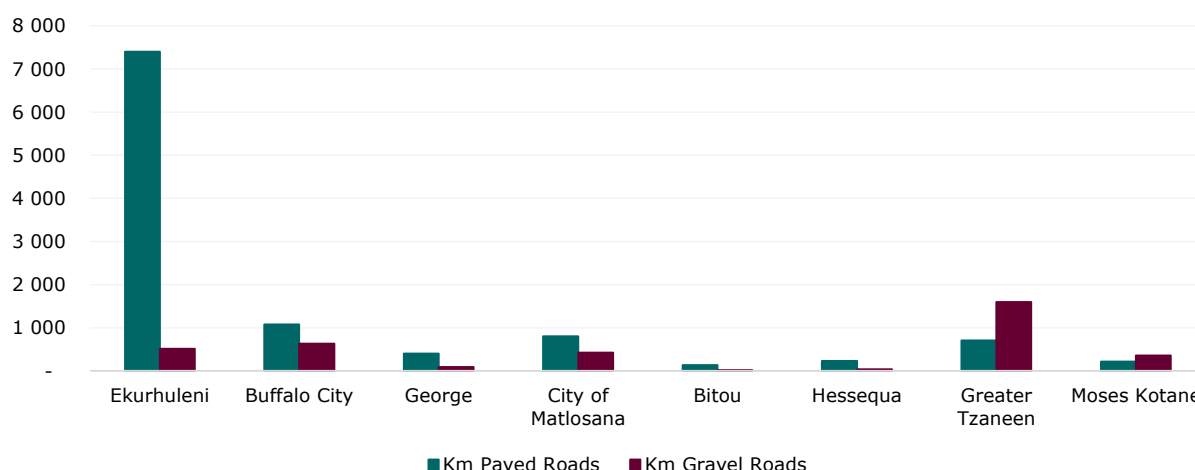
**Table 39 Base data - Selected municipalities**

Test Data	Province	Code	Category	<sup>1</sup> Number of Households (2013/14)	Number of Poor Households (2013/14)	Poor vs. Total Households	Paved KM	Gravel KM
Ekurhuleni	Gauteng	EKU	A	1 015 465	532 516	52,44%	7399	515
Buffalo City	Eastern Cape	BUF	A	223 568	134 930	60,35%	1082	636
George	Western Cape	WC044	B1	53 551	25 377	47,39%	404	94
City Of Matlosana	North West	NW403	B1	120 442	69 705	57,87%	801	425
Bitou	Western Cape	WC047	B3	16 645	10 112	60,75%	138	17
Hessequa	Western Cape	WC042	B3	15 873	6 954	43,81%	231	43
Greater Tzaneen	Limpopo	LIM333	B4	108 926	79 378	72,87%	705	1595
Moses Kotane	North West	NW375	B4	75 193	49 844	66,29%	222	362

**Figure 28: Number of households – Selected municipalities**



<sup>1</sup> 2013/14 data was used as this is the latest actual expenditure data available.

**Figure 29: Number of households – Extent of Roads (Kilometers)**

### 11.2.2 Data analysis

As eluded to earlier, the standard of roads and stormwater (standards of service) has a significant impact on the expenditure needs. In order to normalise this standard and to establish a baseline which could be extrapolated across all municipalities, actual cost incurred by the test municipalities were adjusted to reflect similar circumstances. These adjustments, as illustrated in the table below, are based on assumptions made in order to equalise expenditure required based on maintenance regimes and local conditions. In other words, the expenditure which would have been incurred if all conditions were equal and a general road and stormwater infrastructure condition of fair was required.

**Table 40: Test Municipalities – Equalisation of cost**

Test Data	Province	Code	Category	Actual operations and maintenance cost (2013/14)	Adjustment factor	Adjusted operations and maintenance cost
Ekurhuleni	Gauteng	EKU	A	442 090 000	0%	442 090 000
Buffalo City	Eastern Cape	BUF	A	107 478 292	25%	134 347 865
George	Western Cape	WC044	B1	38 115 000	0%	38 115 000
City of Matlosana	North West	NW403	B1	52 383 000	15%	60 240 450
Bitou	Western Cape	WC047	B3	7 607 000	0%	7 607 000
Hessequa	Western Cape	WC042	B3	16 431 487	-30%	11 502 041
Greater Tzaneen	Limpopo	LIM333	B4	36 080 000	20%	43 296 000
Moses Kotane	North West	NW375	B4	10 231 000	35%	13 811 850

The next step in the process is to determine the cost per household. As discussed under the Capital Cost segment of this report, all households do not have access to roads. In order to determine the cost per household, only households with access to roads were taken into account and the cost per poor household with access to roads have been determined. This cost is illustrated in the following two tables below:

**Table 41: Test Municipalities – Cost per household with access to roads and stormwater**

Test Data	Code	Category	Adjusted operations and maintenance cost	Households with access to service	Rand per household with access
Ekurhuleni	EKU	A	442 090 000	796 268	555
Buffalo City	BUF	A	134 347 865	164 697	816
George	WC044	B1	38 115 000	45 317	841
City of Matlosana	NW403	B1	60 240 450	100 765	598
Bitou	WC047	B3	7 607 000	12 221	622
Hessequa	WC042	B3	11 502 041	14 934	770
Greater Tzaneen	LIM333	B4	43 296 000	101 058	428
Moses Kotane	NW375	B4	13 811 850	59 579	232



In order to extrapolate the above results to the entire population, a median of cost per category of municipality was calculated. This median, as illustrated in the table below forms the base for the distribution of cost to poor households.

**Table 42: Test Municipalities – Median of cost per household with access to roads and stormwater services**

Category	Median - cost per household
Category A	685
Category B1	719
Category B2	696
Category B3	696
Category B4	330

The element that has the largest impact on the total cost of operations and maintenance of roads and stormwater infrastructure lies within the difference between expenditure requirements of paved and gravel roads. Although it is a known reality that the majority of poor households only have access to gravel roads, the extent of this distribution cannot be normalised and attempting to do so will only create a false sense of accuracy. In lieu of a reasonably acceptable norm relating to the distribution, the current replacement cost (CRC) and its distribution between poor and other households, as modelled in the capital segment of this report is used to accommodate for this cost factor. A norm of 45% CRC attributable to poor households have therefore been used as the factor to determine operations and maintenance cost attributable to poor households. This distribution was in turn used to project the adjusted 2013/14 actual cost to the 2014/15 equivalent, after taking into account an assumed CPIX of 5.8%, and projecting the cost attributable to poor households based on the total poor household population for 2014/15 and the following years. The summarised results, per category is illustrated in the table and figure below and Appendix D provides the detail per municipality.

**Table 43: Roads and Stormwater operations and maintenance cost attributable per poor household**

Category	2014/15 - Cost per poor h/h	2014/15 Cost per poor h/h as % of CRC per poor h/h	2015/16 Cost per poor h/h	2015/16 Cost per poor h/h as % of CRC per poor h/h	2016/17 Cost per poor h/h	2016/17 Cost per poor h/h as % of CRC per poor h/h	2017/18 - Cost per poor h/h	2017/18 Cost per poor h/h as % of CRC per poor h/h
A	441,27	0,94%	452,62	0,90%	462,81	0,87%	474,04	0,84%
B1	468,44	1,22%	479,64	1,18%	489,02	1,13%	499,76	1,09%
B2	468,01	2,19%	481,38	2,12%	492,87	2,05%	505,91	1,98%
B3	493,10	2,31%	510,77	2,25%	527,38	2,19%	545,56	2,14%
B4	263,45	2,22%	274,62	2,18%	284,45	2,13%	295,62	2,09%

**Figure 30: Roads and Stormwater operations and maintenance cost attributable per poor household**



Based on the analysis above, and with the addition of the estimated annual cost for renewal of roads and stormwater infrastructure, the model have been used to determine the combined operational cost for the provision of roads and storm water services to the poor. The combined operations, maintenance and depreciation cost package determines the annual operational expenditure, totalling R 14.2 billion per annum to serve low income households, as indicated in the table below:

**Table 44: Estimated roads and stormwater operations, maintenance and depreciation costs per province - 2015/16 (R 000) Scenario A**

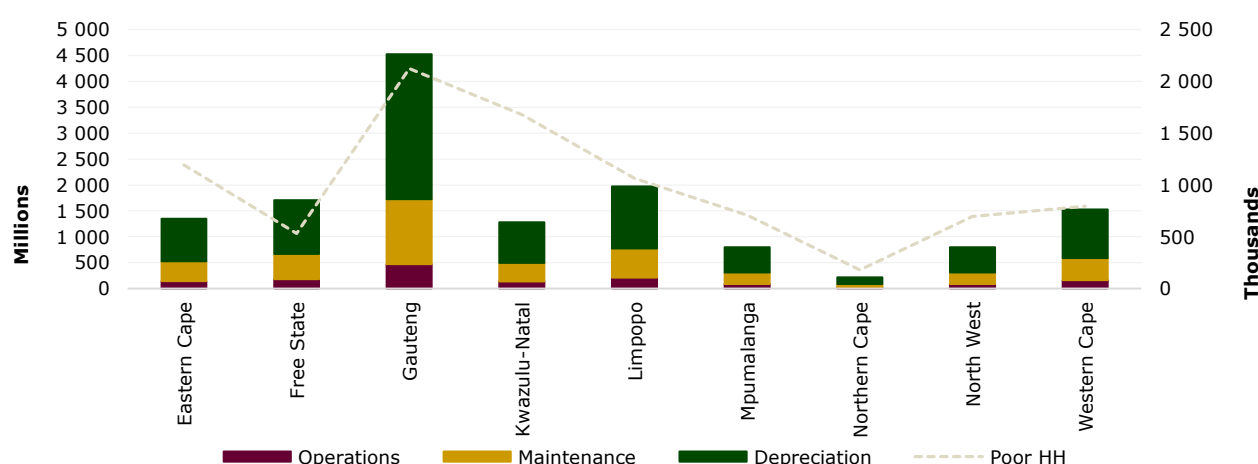
Province	Poor HH	Operations	Maintenance	Depreciation	Total Cost
Eastern Cape	1 192	143 313	384 292	822 758	1 350 363
Free State	532	181 556	485 489	1 037 219	1 704 264
Gauteng	2 124	470 109	1 257 556	2 799 630	4 527 295
Kwazulu-Natal	1 678	134 683	361 063	783 879	1 279 625
Limpopo	1 064	210 758	565 121	1 194 228	1 970 107
Mpumalanga	708	85 041	227 787	484 183	797 011
Northern Cape	179	23 036	61 536	134 827	219 398
North West	696	84 131	224 824	489 971	798 926
Western Cape	793	160 368	429 771	934 736	1 524 875
<b>Total</b>	<b>8 966</b>	<b>1 492 995</b>	<b>3 997 439</b>	<b>8 681 430</b>	<b>14 171 864</b>

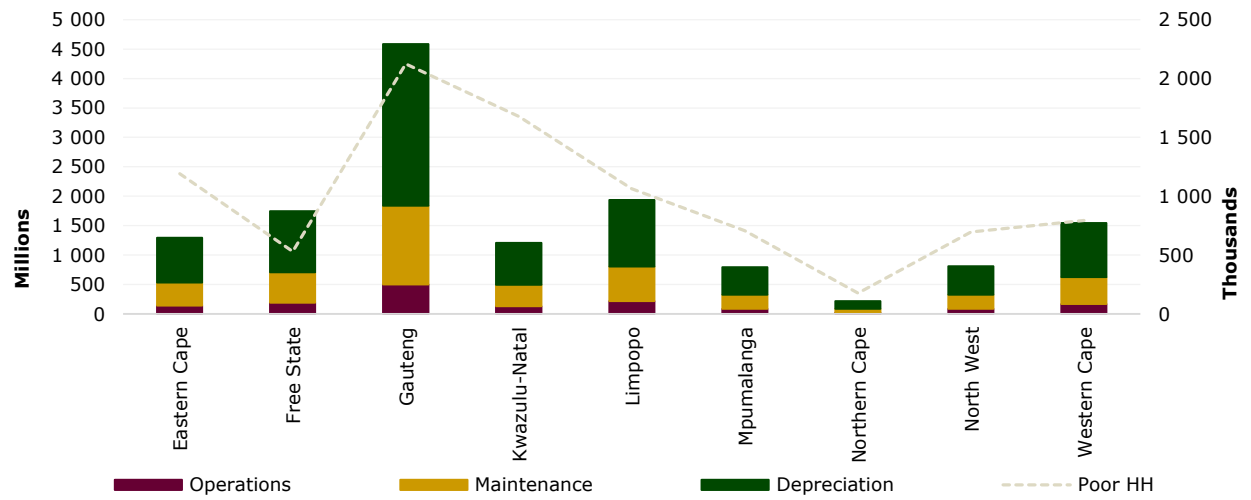
**Table 45: Estimated roads and stormwater operations, maintenance and depreciation costs per province - 2015/16 (R 000) Scenario B**

Province	Poor HH	Operations	Maintenance	Depreciation	Total Cost
Eastern Cape	1 192	145 784	390 896	760 646	1 297 325
Free State	532	193 582	517 642	1 034 891	1 746 115
Gauteng	2 124	500 327	1 338 392	2 747 770	4 586 489
Kwazulu-Natal	1 678	134 524	360 642	714 332	1 209 498
Limpopo	1 064	218 568	586 062	1 131 987	1 936 618
Mpumalanga	708	89 411	239 478	468 095	796 984
Northern Cape	179	24 041	64 219	129 746	218 006
North West	696	90 053	240 646	482 521	813 220
Western Cape	793	170 516	456 966	919 048	1 546 530
<b>Total</b>	<b>8 966</b>	<b>1 566 806</b>	<b>4 194 943</b>	<b>8 389 037</b>	<b>14 150 786</b>

Although the effect of asset sweating is not very significant early in the cycle, it shows already that lower expenditure on maintenance results in higher depreciation (and renewal needs). The results above are shown graphically in the figures that follows.

**Figure 31: Roads and Stormwater operations, maintenance and depreciation costs (Scenario A)**



**Figure 32: Roads and Stormwater operations, maintenance and depreciation costs (Scenario B)**

## APPENDIX A: Base Year (2014/15) Data for Households and Growth -

Source: Treasury Website

Municipality	Code	Cat	Number of Households '15	Households income < R2300	Assumed Household Growth Rate
<b>Buffalo City</b>	<b>BUF</b>	<b>A</b>	<b>227 315</b>	<b>137 191</b>	<b>1.68%</b>
<b>Nelson Mandela Bay</b>	<b>NMA</b>	<b>A</b>	<b>331 891</b>	<b>182 638</b>	<b>2.34%</b>
Camdeboo	EC101	B	12 583	7 085	1.49%
Blue Crane Route	EC102	B	9 791	6 465	0.31%
Ikwezi	EC103	B	2 937	2 092	0.77%
Makana	EC104	B	21 788	12 499	1.87%
Ndlambe	EC105	B	19 808	12 669	2.46%
Sundays River Valley	EC106	B	15 240	9 986	3.34%
Baviaans	EC107	B	4 651	2 926	0.90%
Kouga	EC108	B	30 740	17 358	4.39%
Kou-Kamma	EC109	B	11 237	6 716	1.87%
Mbhashe	EC121	B	60 779	47 348	1.09%
Mnquma	EC122	B	70 184	53 164	0.65%
Great Kei	EC123	B	10 324	7 657	0.14%
Amahlathi	EC124	B	34 216	25 464	0.16%
Ngqushwa	EC126	B	21 413	16 977	0.14%
Nkonkobe	EC127	B	35 710	26 871	1.00%
Nxuba	EC128	B	6 738	4 624	0.38%
Inxuba Yethemba	EC131	B	18 757	11 137	1.58%
Tsolwana	EC132	B	9 694	7 410	2.09%
Inkwanca	EC133	B	6 329	4 502	1.61%
Lukanji	EC134	B	52 072	33 711	1.76%
Intsika Yethu	EC135	B	40 948	32 652	1.23%
Emalahleni	EC136	B	32 203	25 418	1.65%
Engcobo	EC137	B	37 634	29 794	1.12%
Sakhisizwe	EC138	B	16 272	12 066	0.75%
Elundini	EC141	B	38 407	30 937	1.46%
Senqu	EC142	B	38 541	30 170	1.30%
Maletswai	EC143	B	12 423	7 516	2.61%
Gariep	EC144	B	9 952	6 415	1.87%
Ngquza Hill	EC153	B	56 929	44 081	1.28%
Port St Johns	EC154	B	32 059	26 087	1.08%
Nyandeni	EC155	B	62 516	49 741	1.40%
Mhlontlo	EC156	B	43 473	34 082	0.14%
King Sabata Dalindyebo	EC157	B	107 084	74 807	1.75%
Matatiele	EC441	B	49 896	39 560	0.75%
Umzimvubu	EC442	B	46 999	36 608	0.23%
Mbizana	EC443	B	48 791	38 360	0.71%
Ntabankulu	EC444	B	24 432	19 553	0.14%
<b>FREE STATE</b>					
<b>Mangaung</b>	<b>MAN</b>	<b>A</b>	<b>239 011</b>	<b>130 045</b>	<b>3.06%</b>
Letsemeng	FS161	B	11 329	7 169	0.75%
Kopanong	FS162	B	15 763	10 290	0.75%
Mohokare	FS163	B	11 024	7 690	2.15%

Municipality	Code	Cat	Number of Households '15	Households income < R2300	Assumed Household Growth Rate
Naledi	FS164	B	7 757	5 644	0.90%
Masilonyana	FS181	B	17 755	12 280	1.05%
Tokologo	FS182	B	8 765	6 092	0.75%
Tswelopele	FS183	B	12 081	8 030	0.75%
Matjhabeng	FS184	B	124 420	74 506	1.00%
Nala	FS185	B	21 865	15 113	0.75%
Setsoto	FS191	B	34 038	24 271	1.04%
Dihlabeng	FS192	B	39 482	22 851	2.31%
Nketoana	FS193	B	17 711	11 728	2.28%
Maluti-a-Phofung	FS194	B	102 036	75 766	1.81%
Phumelela	FS195	B	13 064	8 661	1.37%
Mantsopa	FS196	B	15 431	9 970	1.73%
Moqhaka	FS201	B	46 446	28 125	1.72%
Ngwathe	FS203	B	37 926	25 981	2.22%
Metsimaholo	FS204	B	47 741	25 766	4.34%
Mafube	FS205	B	16 799	11 217	2.06%
<b>GAUTENG</b>					
<b>Ekurhuleni</b>	<b>EKU</b>	<b>A</b>	<b>1 055 277</b>	<b>553 393</b>	<b>3.92%</b>
<b>City of Johannesburg</b>	<b>JHB</b>	<b>A</b>	<b>1 497 873</b>	<b>739 757</b>	<b>4.39%</b>
<b>City of Tshwane</b>	<b>TSH</b>	<b>A</b>	<b>956 725</b>	<b>433 564</b>	<b>4.96%</b>
Emfuleni	GT421	B	225 463	131 200	2.42%
Midvaal	GT422	B	31 507	16 239	5.14%
Lesedi	GT423	B	31 343	17 252	5.65%
Mogale City	GT481	B	122 115	66 385	4.04%
Randfontein	GT482	B	44 421	22 195	2.59%
Westonaria	GT483	B	41 582	24 729	3.69%
Merafong City	GT484	B	68 265	32 906	2.46%
<b>KWAZULU-NATAL</b>					
<b>eThekweni</b>	<b>ETH</b>	<b>A</b>	<b>977 019</b>	<b>540 992</b>	<b>2.12%</b>
Vulamehlo	KZN211	B	16 193	12 419	0.36%
Umdoni	KZN212	B	23 842	15 242	4.25%
Umzumbe	KZN213	B	35 221	26 956	0.14%
uMuziwabantu	KZN214	B	21 921	16 628	1.40%
Ezingoleni	KZN215	B	11 564	8 609	0.80%
Hibiscus Coast	KZN216	B	74 773	44 144	3.60%
uMshwathi	KZN221	B	28 634	20 634	1.82%
uMngeni	KZN222	B	31 772	17 841	4.21%
Mpofana	KZN223	B	10 555	7 154	0.99%
Impendle	KZN224	B	8 213	6 464	0.14%
Msunduzi	KZN225	B	168 049	94 603	2.47%
Mkhambathini	KZN226	B	15 253	11 052	1.92%
Richmond	KZN227	B	16 917	12 418	2.90%
Emnambithi/Ladysmith	KZN232	B	58 956	37 449	1.55%
Indaka	KZN233	B	20 063	15 820	0.14%
Umtshezi	KZN234	B	20 036	12 985	4.07%
Okhahlamba	KZN235	B	27 700	20 762	0.45%
Imbabazane	KZN236	B	22 397	16 912	0.14%
Endumeni	KZN241	B	17 417	10 242	3.37%
Nqutu	KZN242	B	31 889	23 407	0.87%
Msinga	KZN244	B	38 360	30 627	1.69%

Municipality	Code	Cat	Number of Households '15	Households income < R2300	Assumed Household Growth Rate
Umvoti	KZN245	B	28 229	20 954	3.47%
Newcastle	KZN252	B	85 833	54 794	1.85%
Emadlangeni	KZN253	B	6 269	3 920	0.25%
Dannhauser	KZN254	B	20 584	14 912	0.71%
eDumbe	KZN261	B	16 270	11 847	0.81%
uPhongolo	KZN262	B	29 243	21 708	1.64%
Abaqulusi	KZN263	B	44 182	29 789	2.04%
Nongoma	KZN265	B	34 680	23 903	0.99%
Ulundi	KZN266	B	35 396	23 307	0.56%
Umhlabuyalingana	KZN271	B	34 770	26 981	2.70%
Jozini	KZN272	B	39 475	29 203	1.61%
The Big 5 False Bay	KZN273	B	8 212	6 168	2.70%
Hlabisa	KZN274	B	12 821	8 718	1.87%
Mtubatuba	KZN275	B	36 169	24 598	3.62%
Mfolozi	KZN281	B	26 374	18 384	3.09%
uMhlathuze	KZN282	B	88 973	47 105	2.73%
Ntambanana	KZN283	B	12 885	9 246	0.45%
uMlalazi	KZN284	B	45 851	32 092	1.75%
Mthonjaneni	KZN285	B	10 480	7 490	0.46%
Nkandla	KZN286	B	22 495	15 798	0.14%
Mandeni	KZN291	B	39 412	28 378	3.07%
KwaDukuza	KZN292	B	73 741	46 448	4.92%
Ndwedwe	KZN293	B	29 645	22 180	1.52%
Maphumulo	KZN294	B	20 003	15 249	0.14%
Ingwe	KZN431	B	23 289	17 853	0.93%
Kwa Sani	KZN432	B	3 678	2 437	0.14%
Greater Kokstad	KZN433	B	19 166	12 009	0.14%
Ubuhlebezwe	KZN434	B	23 738	18 012	1.07%
Umzimkhulu	KZN435	B	43 703	34 589	1.85%
<b>LIMPOPO</b>					
Greater Giyani	LIM331	B	65 036	50 380	2.34%
Greater Letaba	LIM332	B	59 526	47 523	2.17%
Greater Tzaneen	LIM333	B	112 103	81 694	2.92%
Ba-Phalaborwa	LIM334	B	42 503	25 842	3.38%
Maruleng	LIM335	B	25 139	19 541	2.73%
Musina	LIM341	B	21 283	15 316	6.18%
Mutale	LIM342	B	24 532	18 923	3.29%
Thulamela	LIM343	B	160 854	120 939	2.72%
Makhado	LIM344	B	138 542	101 027	2.71%
Blouberg	LIM351	B	41 858	33 168	1.62%
Aganang	LIM352	B	34 286	26 111	1.09%
Molemole	LIM353	B	30 422	23 195	1.26%
Polokwane	LIM354	B	185 357	113 199	4.13%
Lepele-Nkumpi	LIM355	B	60 909	44 587	2.06%
Thabazimbi	LIM361	B	25 690	12 220	2.44%
Lephalale	LIM362	B	31 219	16 934	4.49%
Mookgopong	LIM364	B	10 243	6 716	3.28%
Modimolle	LIM365	B	17 672	10 172	0.84%
Bela-Bela	LIM366	B	18 867	11 467	4.42%
Mogalakwena	LIM367	B	81 047	56 787	2.08%

Municipality	Code	Cat	Number of Households '15	Households income < R2300	Assumed Household Growth Rate
Ephraim Mogale	LIM471	B	33 400	26 102	3.46%
Elias Motsoaledi	LIM472	B	62 290	45 706	3.38%
Makhuduthamaga	LIM473	B	66 927	51 404	2.62%
Fetakgomo	LIM474	B	23 410	16 329	2.45%
Greater Tubatse	LIM475	B	87 359	57 202	5.00%
<b>MPUMALANGA</b>					
Albert Luthuli	MP301	B	48 688	35 014	2.06%
Msukaligwa	MP302	B	42 347	24 210	3.46%
Mkhondo	MP303	B	38 624	26 641	3.18%
Pixley Ka Seme	MP304	B	20 069	13 560	1.17%
Lekwa	MP305	B	31 788	17 300	2.31%
Dipaleseng	MP306	B	13 031	7 913	3.12%
Govan Mbeki	MP307	B	86 653	44 277	3.31%
Victor Khanye	MP311	B	21 482	12 622	4.54%
Emalahleni	MP312	B	125 881	58 419	5.01%
Steve Tshwete	MP313	B	69 009	30 579	6.22%
Emakhazeni	MP314	B	14 232	8 415	3.70%
Thembisile Hani	MP315	B	77 876	50 570	2.97%
Dr JS Moroka	MP316	B	63 213	44 966	1.69%
Thaba Chweu	MP321	B	34 955	21 229	4.81%
Mbombela	MP322	B	168 104	98 747	3.91%
Umjindi	MP323	B	20 992	12 239	3.63%
Nkomazi	MP324	B	98 455	73 108	3.08%
Bushbuckridge	MP325	B	137 341	105 321	2.34%
<b>NORTHERN CAPE</b>					
Richtersveld	NC061	B	3 663	1 674	3.41%
Nama Khoi	NC062	B	13 478	6 661	2.14%
Kamiesberg	NC064	B	3 187	1 924	1.32%
Hantam	NC065	B	6 435	3 384	1.49%
Karoo Hoogland	NC066	B	3 956	2 277	2.98%
Khâi-Ma	NC067	B	3 923	1 993	3.36%
Ubuntu	NC071	B	5 249	3 326	2.38%
Umsobomvu	NC072	B	8 096	4 926	3.26%
Emthanjeni	NC073	B	10 680	5 454	2.13%
Kareeberg	NC074	B	3 327	2 015	3.27%
Renosterberg	NC075	B	3 066	1 888	2.32%
Thembelihle	NC076	B	4 211	2 324	1.70%
Siyathemba	NC077	B	6 006	3 470	3.01%
Siyancuma	NC078	B	9 603	5 826	0.27%
Mier	NC081	B	1 801	1 080	0.93%
!Kai !Garib	NC082	B	17 046	10 083	2.04%
//Khara Hais	NC083	B	23 922	11 740	2.91%
!Kheis	NC084	B	4 164	2 463	0.44%
Tsantsabane	NC085	B	10 237	4 907	4.05%
Kgatelopele	NC086	B	5 619	2 712	4.43%
Sol Plaatjie	NC091	B	61 538	30 854	2.06%
Dikgatlong	NC092	B	12 190	8 353	1.87%
Magareng	NC093	B	6 178	4 164	0.95%
Phokwane	NC094	B	17 669	11 564	0.71%
Joe Morolong	NC451	B	23 978	18 205	1.14%



Municipality	Code	Cat	Number of Households '15	Households income < R2300	Assumed Household Growth Rate
Ga-Segonyana	NC452	B	28 116	16 563	4.85%
Gamagara	NC453	B	11 638	4 821	7.67%
<b>NORTH WEST</b>					
Moretele	NW371	B	52 592	38 260	1.02%
Madibeng	NW372	B	168 084	98 676	4.58%
Rustenburg	NW373	B	209 046	104 157	5.02%
Kgetlengrivier	NW374	B	15 109	10 398	2.98%
Moses Kotane	NW375	B	76 134	50 468	1.25%
Ratlou	NW381	B	27 106	21 584	0.81%
Tswaing	NW382	B	31 020	21 912	1.26%
Mafikeng	NW383	B	85 870	54 250	1.94%
Ditsobotla	NW384	B	45 178	29 272	1.52%
Ramotshere Moiloa	NW385	B	41 435	29 187	1.71%
Naledi	NW392	B	18 913	11 683	1.83%
Mamusa	NW393	B	14 999	10 266	2.57%
Greater Taung	NW394	B	49 038	37 897	0.87%
Lekwa-Teemane	NW396	B	15 320	9 757	2.61%
NW397	NW397	B	28 723	22 138	0.67%
Ventersdorp	NW401	B	14 855	10 505	2.00%
Tlokwe	NW402	B	54 803	30 374	4.31%
City of Matlosana	NW403	B	122 662	70 990	1.84%
Maquassi Hills	NW404	B	20 734	14 729	1.11%
<b>WESTERN CAPE</b>					
<b>City of Cape Town</b>	<b>CPT</b>	<b>A</b>	<b>1 102 115</b>	<b>484 997</b>	<b>3.14%</b>
Matzikama	WC011	B	19 182	9 505	1.84%
Cederberg	WC012	B	13 824	7 316	2.30%
Bergrivier	WC013	B	16 757	7 346	2.96%
Saldanha Bay	WC014	B	30 020	13 510	4.11%
Swartland	WC015	B	30 793	13 957	5.02%
Witzenberg	WC022	B	28 118	14 305	2.54%
Drakenstein	WC023	B	61 378	25 548	2.68%
Stellenbosch	WC024	B	45 059	23 083	3.77%
Breede Valley	WC025	B	43 325	21 506	1.88%
Langeberg	WC026	B	25 490	12 908	1.45%
Theewaterskloof	WC031	B	29 447	15 606	1.95%
Overstrand	WC032	B	29 112	14 597	3.93%
Cape Agulhas	WC033	B	10 417	4 585	2.51%
Swellendam	WC034	B	10 405	4 736	2.64%
Kannaland	WC041	B	6 206	3 540	0.00%
Hessequa	WC042	B	16 201	7 098	2.08%
Mossel Bay	WC043	B	28 886	14 495	3.07%
George	WC044	B	55 116	26 119	2.92%
Oudtshoorn	WC045	B	22 257	10 945	1.59%
Bitou	WC047	B	17 689	10 746	6.28%
Knysna	WC048	B	22 676	12 046	3.58%
Laingsburg	WC051	B	2 454	1 261	1.95%
Prince Albert	WC052	B	3 690	1 980	3.12%
Beaufort West	WC053	B	13 333	7 897	1.86%
<b>Total</b>	<b>DC5</b>	<b>C</b>	<b>14 877 842</b>	<b>8 702 984</b>	

## APPENDIX B: Calibration and testing of results

Detailed information available from municipalities was used to determine and compare CRC values, and costs per service at asset group level to calibrate values that were established. An example shown below, indicates the results obtained when the infrastructure costs for the water and sanitation sectors for Buffalo City Metropolitan Municipality were analysed. The data for the municipality was derived per SDF 'priority zone'. Each of the zones included both high and lower income customers, with the first four zones being mostly urban and the fifth zone mainly rural. The LOS (levels of service) categories that were determined and used are indicated below:

**LOS hierarchy for potable water services with minimum and target levels of service**

LOS	Description
0	Natural resources
1	Water point more than 200m distance
2	<b>Communal standpipe or stationary water tank less than 200m distance</b>
3	Yard tap connection (single tap)
4	<b>15 - 25 mm connection to building (multiple taps)</b>
5	40 - 100 mm consumer connection
6	150 mm or larger consumer connection
Note 1	<b>Minimum Level of service and access target for rural customers</b>
Note 2	<b>Target for minimum level of service for urban customers</b>

**LOS hierarchy for sanitation services with minimum and target levels of service**

LOS	Description
0	No formal service
1	Bucket system
2	Unventilated pit latrines and soakaways
3	<b>Ventilated improved pit (VIP)</b>
4	Dry composting toilet
5	Communal chemical toilet
6	Flushing Communal Toilet
7	Septic or conservancy tank
8	<b>Waterborne sewerage to each stand 110mm connection (no toilet structure)</b>
9	Waterborne sewerage to each stand 110mm connection, with toilet structure
10	Waterborne sewer available, max connection size 150 mm or larger
11	Waterborne sewerage, discharge load is above normal limits.
Note 1	<b>Minimum Level of service and access target for rural customers</b>
Note 2	<b>Target for minimum level of service for urban customers</b>

The two tables that follows indicate the number of customers per LOS, summarised to show only the number of customers for the minimum, target, and full LOS:

**Nr of customer units at each LOS for water per priority area**

Water Level of Service	LOS <2 (min)	LOS 3	LOS 6	Total
Priority Zone 1 - Central	504	27 506	101 590	129 599
Priority Zone 2 - Westbank	701	2 988	6 774	10 463
Priority Zone 3a - Berlin	266	7 591	25 638	33 495
Priority Zone 3b - Quennera	746	4 540	15 079	20 365
Rural	7 549	35 261	8 543	51 354
<b>Total</b>	<b>9 766</b>	<b>77 886</b>	<b>157 624</b>	<b>245 276</b>

**Nr of customer units at significant LOS for sanitation per priority area**

Sanitation Level of Service	LOS <2 (min)	LOS 7	LOS 10	Total
Priority Zone 1 - Central	5 942	2 004	121 654	129 600
Priority Zone 2 - Westbank	1 497	2 062	6 904	10 463
Priority Zone 3a - Berlin	1 333	5 260	26 902	33 495
Priority Zone 3b - Quennera	3 661	729	15 974	20 364
Rural	7 608	35 095	8 650	51 353
<b>Total</b>	<b>20 041</b>	<b>45 150</b>	<b>180 084</b>	<b>245 275</b>

The comparative cost per asset group per priority area was determined, as indicated in the next two tables, which results indicate the difference in comparative costs for rural and urban areas:

**Relative cost per asset group for water services per priority area**

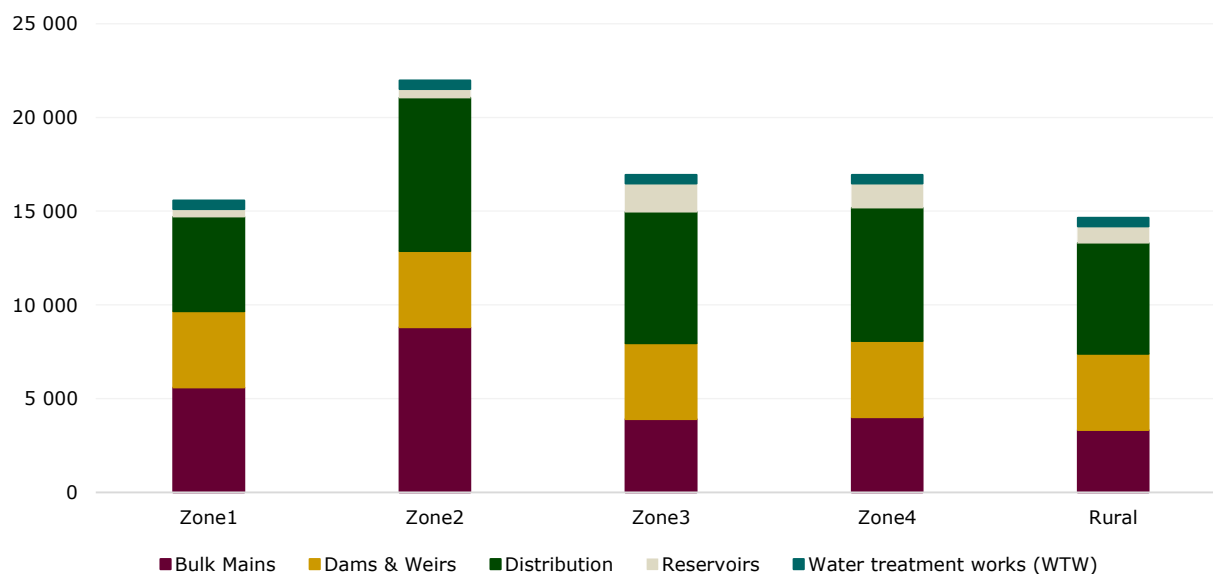
Priority Zone	Bulk Mains	Dams & Weirs	Distribution	Reservoirs	WTW	Other	Total
Zone 1	34.9%	25.4%	31.6%	2.5%	2.9%	2.7%	100.0%
Zone 2	40.1%	18.5%	37.2%	2.1%	2.1%	0.1%	100.0%
Zone 3	22.7%	23.7%	40.8%	8.9%	2.7%	1.2%	100.0%
Zone 4	23.5%	23.9%	41.8%	7.6%	2.7%	0.5%	100.0%
Zone 5	22.2%	27.1%	39.5%	6.0%	3.1%	2.1%	100.0%
<b>Total</b>	<b>30.0%</b>	<b>24.9%</b>	<b>35.6%</b>	<b>4.5%</b>	<b>2.8%</b>	<b>2.0%</b>	<b>100.0%</b>

**Relative cost per asset group for sanitation per priority area**

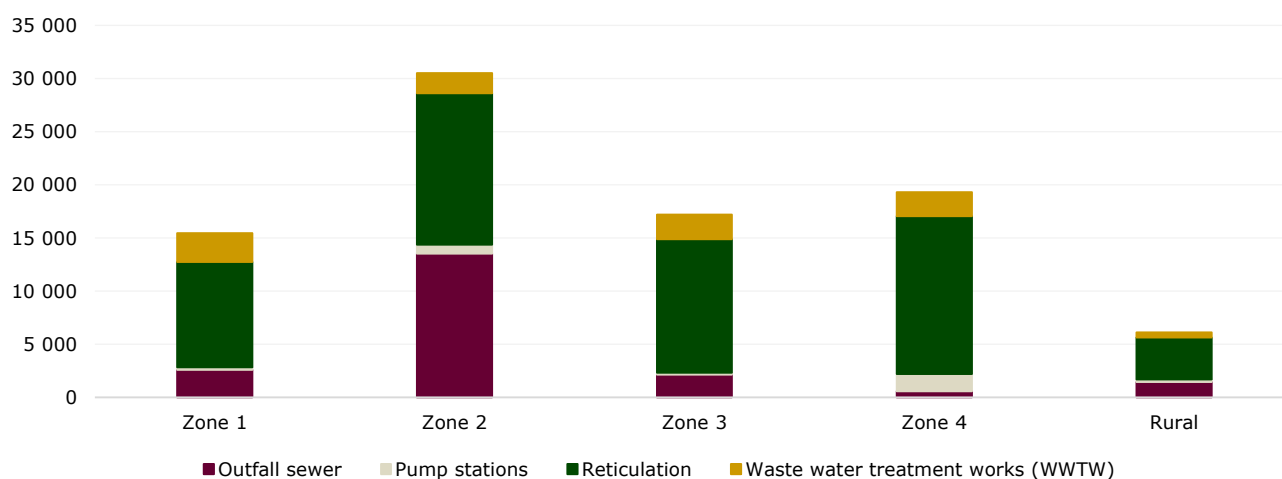
Priority Zone	Outfall sewer	Pump stations	Reticulation	WWTW	Total
Zone 1	19.3%	1.7%	74.0%	20.2%	100.0%
Zone 2	46.8%	2.9%	49.3%	6.6%	100.0%
Zone 3	10.8%	0.9%	63.5%	11.8%	100.0%
Zone 4	3.0%	8.8%	79.7%	12.1%	100.0%
Zone 5	14.1%	2.4%	38.3%	4.8%	100.0%
<b>Total</b>	<b>17.6%</b>	<b>2.5%</b>	<b>65.4%</b>	<b>14.4%</b>	<b>100.0%</b>

The cost variations across areas and per asset group is illustrated in the tables below. The major differences between predominantly urban areas occur in Zone 2 (with higher than average costs), which includes both the Central East London area, and Mdantsane where a large proportion of customers are in the lower income groups, having been serviced more recently. The cost difference in the rural area is also evident, especially in terms of sanitation services:

Cost distribution – Water services



Cost distribution – Sanitation services



## APPENDIX C: Unit rates for services

Comparison – Original and adjusted Unit rates and MIG Guideline

Sector	Unit	Original values	Adjusted 2014 CRC (ver 18)	MIG Jun 2014	Final @ MIG
<b>Roads and stormwater</b>	Metros - formal houses + 0.5 trad / informal	48 000	44 475	51 595	0.862
	Secondary mun's (ditto)	22 000	36 188	43 490	0.832
	Other LMs (ditto)	8 000	20 170	34 154	0.591
	Districts (ditto)	10 000	11 186	12 231	0.915
<b>Water and Sanitation</b>	Metro & Secondary Water serviced hh +0.5 standpipes	13 000	16 059	28 359	0.566
	Sanitation Metro & Secondary w'borne hh	18 000	18 405	28 024	0.657
	other * ditto (water)	9 000	18 155	29 501	0.615
	other * ditto (san)	12 000	15 367	32 733	0.469
	other * ditto (san)	12 000	15 367	17 764	0.865
<b>Electricity service</b>	total hh with Elec service	13 045	14 797	14 347	1.031
<b>Cemeteries</b>	Cemeteries	NA	166	1 031	0.161
<b>Landfill site</b>	Landfill site	NA	1 754	1 590	0.907
	Landfill site	NA	544	734	1.349
	Landfill site	NA	314	428	1.363
<b>Operational Bldgs</b>	Operational Bldgs (A and B1)	NA	2 533	3 916	0.647
<b>Fire station</b>	Fire station (A)	NA	362	241	1.504
	Fire station (B 2- B4) - roll up to DLM	NA	165	241	0.686
	Fire station	NA	216	241	0.898

## APPENDIX D: Administrative cost per household attributable to poor households

Municipality	Code	PDG Cat	Poor Households (2015/16)	Councillor Remuneration	Cost of Administrative Staff Required to serve Poor Households	Audit Fees	Administrative Basket of Services	Administrative Cost per Poor Household
<b>Western Cape</b>								
Cape Town	CPT	A	500 222	264 301	1 255 143 393	25 729 851	1 106 839 300	4 774
Matzikama	WC011	B3	9 680	194 170	50 050 023	1 254 147	11 850 624	6 544
Cederberg	WC012	B3	7 484	217 461	36 229 321	969 660	9 057 318	6 210
Bergrivier	WC013	B3	7 563	177 038	44 202 152	979 934	9 948 688	7 313
Saldanha Bay	WC014	B2	14 065	165 505	82 776 086	2 157 434	41 155 744	8 976
Swartland	WC015	B3	14 657	168 316	82 844 531	1 898 995	14 622 889	6 791
West Coast	DC1	C1	53 450	105 820	43 938 503	1 534 078	33 664 741	1 483
Witzenberg	WC022	B3	14 669	191 029	73 866 632	1 900 490	17 007 968	6 338
Drakenstein	WC023	B1	26 234	141 830	72 288 506	693 205	58 128 628	5 003
Stellenbosch	WC024	B1	23 954	182 524	53 633 104	632 976	37 523 266	3 839
Breede Valley	WC025	B2	21 910	183 825	116 900 276	3 360 695	45 069 930	7 554
Langeberg	WC026	B3	13 095	188 322	66 250 797	1 696 616	23 603 499	7 006
Cape Winelands	DC2	C1	99 861	128 059	80 038 646	2 866 144	32 420 181	1 156
Theewaterskloof	WC031	B3	15 911	192 818	76 914 914	2 061 481	17 773 893	6 093
Overstrand	WC032	B2	15 172	176 413	80 137 348	2 327 167	47 334 588	8 567
Cape Agulhas	WC033	B3	4 700	178 311	27 354 674	608 987	15 137 874	9 208
Swellendam	WC034	B3	4 861	184 962	27 359 231	629 773	6 918 796	7 220
Overberg	DC3	C1	40 644	150 727	31 321 367	1 166 538	22 183 589	1 349
Kannaland	WC041	B3	3 540	301 246	15 899 831	458 704	5 275 625	6 196
Hessequa	WC042	B3	7 245	150 395	42 366 741	938 687	13 388 996	7 846
Mossel Bay	WC043	B2	14 939	178 905	78 852 233	2 291 534	42 681 843	8 300
George	WC044	B1	26 883	166 940	65 066 211	710 357	32 811 812	3 674
Oudtshoorn	WC045	B2	11 119	181 804	59 884 251	1 705 474	31 310 283	8 372
Bitou	WC047	B3	11 421	244 054	48 164 833	1 479 692	17 305 757	5 884
Knysna	WC048	B2	12 477	193 446	62 207 952	1 913 875	35 956 816	8 036
Eden	DC4	C1	87 625	112 030	66 812 579	2 514 933	29 594 819	1 130
Laingsburg	WC051	B3	1 286	186 699	6 409 397	166 610	1 748 426	6 619
Prince Albert	WC052	B3	2 042	196 331	9 747 966	264 576	2 253 454	6 103
Beaufort West	WC053	B3	8 044	196 705	34 794 518	1 042 233	12 749 509	6 064
Central Karoo	DC5	C1	11 372	145 252	7 630 499	326 400	8 812 511	1 487
<b>Northern Cape</b>								
Richtersveld	NC061	B3	1 731	124 835	9 703 146	224 334	3 863 357	8 037
Nama Khoi	NC062	B3	6 803	143 307	35 267 657	881 458	12 240 390	7 134
Kamiesberg	NC064	B3	1 949	173 005	8 271 939	252 537	3 529 351	6 273
Hantam	NC065	B3	3 435	153 715	16 730 842	445 038	4 305 114	6 298
Karoo Hoogland	NC066	B3	2 345	154 189	10 436 314	303 819	3 457 244	6 120
Khai-Ma	NC067	B3	2 060	139 671	10 389 110	266 844	2 240 480	6 329
Namakwa	DC6	C1	18 324	92 572	13 597 961	525 909	5 853 897	1 095
Ubuntu	NC071	B3	3 406	207 221	13 768 835	441 231	6 904 094	6 261

Municipality	Code	PDG Cat	Poor Households (2015/16)	Councillor Remuneration	Cost of Administrative Staff Required to serve Poor Households	Audit Fees	Administrative Basket of Services	Administrative Cost per Poor Household
Umsobomvu	NC072	B3	5 086	201 857	21 415 842	658 970	7 922 840	5 938
Emthanjeni	NC073	B3	5 570	168 136	27 943 273	721 650	9 770 934	6 931
Kareeberg	NC074	B3	2 081	183 477	8 802 676	269 557	2 799 878	5 794
Renosterberg	NC075	B3	1 932	11 708	8 036 480	250 330	4 026 584	6 379
Thembelihle	NC076	B3	2 363	146 914	10 972 481	306 167	2 697 898	5 977
Siyathemba	NC077	B3	3 574	154 352	15 850 578	463 115	5 987 743	6 282
Siyancuma	NC078	B3	5 842	207 187	24 670 161	756 910	5 933 001	5 403
Pixley ka Seme	DC7	C1	29 854	119 544	19 687 357	856 846	6 892 527	923
Mier	NC081	B3	1 090	153 496	4 656 086	141 202	1 976 039	6 356
Kai! Garib	NC082	B3	10 289	181 487	44 559 525	1 333 003	15 311 010	5 966
//Khara Hais	NC083	B2	12 081	143 500	65 202 786	1 853 142	80 870 161	12 256
IKheis	NC084	B3	2 474	137 678	10 714 870	320 502	3 520 844	5 940
Tsantsabane	NC085	B3	5 106	185 124	27 289 441	661 569	3 719 783	6 239
Kgatelopele	NC086	B3	2 832	141 954	15 033 359	366 961	2 924 507	6 520
Siyanda	DC8	C1	33 872	85 294	24 758 682	972 172	9 024 934	1 029
Sol Plaatje	NC091	B1	31 490	165 516	72 039 864	832 111	79 724 010	4 851
Dikgatlong	NC092	B3	8 509	189 763	31 813 333	1 102 398	7 319 974	4 751
Magareng	NC093	B3	4 203	240 251	15 976 775	544 599	6 054 234	5 428
Phokwane	NC094	B3	11 645	223 799	45 585 145	1 508 808	16 731 702	5 500
Frances Baard	DC9	C1	55 848	125 335	38 080 963	1 602 903	12 800 991	942
Moshaweng (Segonyana)	NC451	B4	18 413	217 830	23 152 348	684 569	14 952 749	2 118
Ga-Segonyana	NC452	B3	17 366	176 194	75 522 650	2 250 017	15 404 870	5 376
Gamagara	NC453	B3	5 191	121 131	32 101 969	672 506	8 696 536	8 013
John Taolo Gaetsewe	DC45	C1	40 970	133 812	25 422 465	1 175 900	10 047 756	898
<b>Eastern Cape</b>								
Buffalo City	BUF	A	139 491	302 885	255 206 224	7 174 971	327 492 375	4 231
Nelson Mandela Bay	NMA	A	186 919	282 570	375 058 875	9 614 519	383 661 885	4 112
Camdeboo	EC101	B3	7 190	156 295	32 717 114	931 600	18 643 482	7 294
Blue Crane Route	EC102	B3	6 484	202 762	25 159 781	840 127	12 387 882	5 951
Ikwezi	EC103	B3	2 108	179 735	7 582 955	273 098	4 239 186	5 823
Makana	EC104	B2	12 733	189 381	58 787 749	1 953 075	38 075 938	7 776
Ndlambe	EC105	B3	12 981	177 507	51 994 361	1 681 792	16 996 928	5 458
Sunday'S River Valley	EC106	B3	10 320	250 625	40 348 999	1 337 089	8 114 617	4 850
Baviaans	EC107	B3	2 952	166 272	12 023 560	382 513	4 112 469	5 651
Kouga	EC108	B3	18 120	194 851	82 209 599	2 347 655	37 425 072	6 743
Kou-kamma	EC109	B3	6 841	166 764	29 326 228	886 344	6 320 970	5 365
Cacadu	DC10	C1	79 730	137 131	50 652 611	2 288 344	10 510 228	798
Mbhashe	EC121	B4	47 862	213 251	58 652 608	1 779 414	6 544 589	1 404
Mnquma	EC122	B4	53 508	293 205	67 435 150	1 989 322	61 968 065	2 461
Great Kei	EC123	B3	7 667	202 563	26 486 071	993 365	7 528 515	4 592
Amahlathi	EC124	B3	25 506	261 856	87 800 745	3 304 543	13 171 699	4 099
Ngqushwa	EC126	B4	17 000	329 853	20 470 682	632 022	23 474 744	2 642
Nkonkobe	EC127	B3	27 141	250 267	92 405 348	3 516 450	24 276 183	4 438
Nxuba	EC128	B3	4 642	200 280	17 326 853	601 375	3 975 908	4 762
Amatole	DC12	C2	183 326	206 723	54 558 433	8 805 121	43 884 660	586



Municipality	Code	PDG Cat	Poor Households (2015/16)	Councillor Remuneration	Cost of Administrative Staff Required to serve Poor Households	Audit Fees	Administrative Basket of Services	Administrative Cost per Poor Household
Inxuba Yethemba	EC131	B3	11 313	230 188	48 813 865	1 465 758	13 064 834	5 620
Tsolwana	EC132	B3	7 565	223 457	25 355 167	980 127	5 484 464	4 236
Inkwanca	EC133	B3	4 574	226 172	16 474 936	592 596	1 058 468	4 012
Lukanji	EC134	B2	34 304	261 464	140 340 012	5 261 786	41 485 089	5 461
Intsika Yethu	EC135	B4	33 055	267 971	39 573 025	1 228 902	32 506 662	2 226
Emalahleni (Ec)	EC136	B4	25 836	252 555	31 249 015	960 536	29 893 242	2 413
Engcobo	EC137	B4	30 129	242 271	36 331 625	1 120 122	27 693 448	2 170
Sakhisizwe	EC138	B3	12 156	258 717	41 998 635	1 574 995	8 985 936	4 345
Chris Hani	DC13	C2	158 932	164 973	49 134 384	7 633 482	1 276 471	366
Elundini	EC141	B4	31 388	249 105	37 199 757	1 166 931	34 389 798	2 326
Senqu	EC142	B4	30 562	224 738	37 272 009	1 136 230	20 914 516	1 948
Maletswai	EC143	B3	7 712	182 762	32 656 361	999 168	10 321 915	5 726
Gariep	EC144	B3	6 534	203 913	25 972 286	846 587	8 084 589	5 373
Joe Gqabi	DC14	C2	76 196	175 302	22 844 292	3 659 684	40 396 454	880
Ngquza Hill	EC153	B4	44 643	212 493	55 041 097	1 659 741	23 460 585	1 800
Port St Johns	EC154	B4	26 370	181 823	30 936 963	980 377	35 973 547	2 581
Nyandeni	EC155	B4	50 440	231 161	60 519 813	1 875 246	45 584 461	2 145
Mhlontlo	EC156	B4	34 129	227 866	41 558 815	1 268 847	32 931 285	2 226
King Sabata Dalindyebo	EC157	B2	76 117	237 496	288 580 798	11 675 409	129 030 446	5 643
O .R. Tambo	DC15	C2	231 699	158 287	69 272 511	11 128 489	44 437 456	539
Matatiele	EC441	B3	39 856	250 320	128 783 759	5 163 768	18 288 570	3 826
Umzimvubu	EC442	B4	36 692	221 479	44 971 051	1 364 145	34 434 623	2 207
Mbizana	EC443	B4	38 631	233 491	46 907 511	1 436 213	41 253 835	2 325
Ntabankulu	EC444	B4	19 580	222 517	23 355 953	727 959	20 832 143	2 305
Alfred Nzo	DC44	C2	134 759	165 903	38 712 399	6 472 481	20 343 963	487
<b>Free State</b>								
Mangaung	MAN	A	134 020	292 981	271 981 432	6 893 595	312 136 304	4 412
Letsemeng	FS161	B3	7 223	197 492	29 242 404	935 820	7 970 987	5 309
Kopanong	FS162	B3	10 368	168 493	40 688 137	1 343 267	17 486 764	5 757
Mohokare	FS163	B3	7 855	215 524	28 851 641	1 017 751	21 539 305	6 572
Naledi (Fs)	FS164	B3	5 695	198 206	20 053 573	737 863	6 303 128	4 792
Xhariep	DC16	C1	31 141	158 718	17 796 714	893 791	9 150 059	899
Masilonyana	FS181	B3	12 409	208 531	45 964 946	1 607 667	20 180 229	5 477
Tokologo	FS182	B3	6 138	210 007	22 623 593	795 311	8 054 082	5 161
Tswelopele	FS183	B3	8 090	219 451	31 185 136	1 048 200	8 548 628	5 068
Matjhabeng	FS184	B1	75 248	227 619	144 130 036	1 988 377	137 235 500	3 769
Nala	FS185	B3	15 227	222 807	56 438 048	1 972 894	21 455 024	5 259
Lejweleputswa	DC18	C1	117 113	159 541	71 605 300	3 361 280	14 012 763	761
Setsotho	FS191	B3	24 524	212 460	88 108 010	3 177 320	29 409 773	4 930
Dihlabeng	FS192	B2	23 379	215 506	106 980 960	3 585 986	65 071 344	7 522
Nketoana	FS193	B3	11 995	219 421	46 408 642	1 554 142	19 497 821	5 642
Maluti A Phofung	FS194	B3	77 134	240 244	266 126 012	9 993 585	51 581 503	4 252
Phumelela	FS195	B3	8 779	222 165	33 925 667	1 137 401	12 473 060	5 440
Mantsopa	FS196	B3	10 143	206 886	40 216 152	1 314 145	11 538 953	5 252
Thabo Mofutsanyana	DC19	C1	155 953	161 128	86 600 581	4 476 054	14 632 228	679

Municipality	Code	PDG Cat	Poor Households (2015/16)	Councillor Remuneration	Cost of Administrative Staff Required to serve Poor Households	Audit Fees	Administrative Basket of Services	Administrative Cost per Poor Household
Moqhaka	FS201	B2	28 608	218 682	125 126 424	4 388 149	44 609 318	6 094
Ngwathe	FS203	B3	26 558	196 401	99 322 210	3 440 869	44 236 674	5 542
Metsimaholo	FS204	B2	26 884	187 397	131 929 200	4 123 646	54 397 523	7 091
Mafube	FS205	B3	11 448	227 997	43 925 093	1 483 269	17 708 926	5 533
Fezile Dabi	DC20	C1	93 498	126 713	58 689 897	2 683 515	11 918 958	785
<b>Kwa-Zulu Natal</b>								
Ethekwini	ETH	A	552 475	283 683	1 101 711 705	28 417 599	1 434 469 143	4 643
Vulamehlo	KZN211	B4	12 463	299 726	15 514 026	463 354	8 555 311	1 992
Umdoni	KZN212	B2	15 890	212 212	65 830 415	2 437 358	20 850 157	5 622
Umzumbe	KZN213	B4	26 995	254 284	33 672 283	1 003 617	18 761 967	1 989
Umuziwabantu	KZN214	B3	16 861	258 236	56 946 410	2 184 489	8 224 283	4 010
Ezingolweni	KZN215	B4	8 678	225 904	11 128 017	322 633	6 151 847	2 054
Hibiscus Coast	KZN216	B2	45 733	201 310	205 170 287	7 014 944	56 988 686	5 890
Ugu	DC21	C2	126 621	169 617	42 505 387	6 081 574	28 073 556	607
uMshwathi	KZN221	B4	21 009	226 369	27 832 550	781 074	22 726 750	2 454
uMngeni	KZN222	B2	18 591	155 512	87 688 278	2 851 695	23 559 445	6 146
Mphofana	KZN223	B3	7 225	204 277	27 307 854	936 087	6 232 453	4 800
Impendle	KZN224	B4	6 474	169 432	7 851 760	240 672	10 406 215	2 884
Msunduzi	KZN225	B1	96 944	317 226	197 521 371	2 561 689	141 473 803	3 527
Mkhambathini	KZN226	B3	11 264	236 588	39 827 132	1 459 416	4 274 718	4 066
Richmond	KZN227	B4	12 778	218 055	16 617 717	475 064	17 085 588	2 692
Umgungundlovu	DC22	C2	174 286	149 158	64 825 477	8 370 928	14 878 792	506
Emnambithi	KZN232	B2	38 028	192 809	158 559 489	5 833 042	99 939 615	6 956
Indaka	KZN233	B4	15 843	224 061	19 180 850	588 997	10 207 895	1 906
Umtshezi	KZN234	B3	13 514	212 902	53 422 701	1 750 848	16 188 436	5 296
Okhahlamba	KZN235	B4	20 855	217 788	26 562 313	775 327	23 948 030	2 470
Imbabazane	KZN236	B4	16 936	206 965	21 412 585	629 659	11 959 060	2 020
Uthukela	DC23	C2	105 175	117 108	34 204 098	5 051 564	25 800 234	620
Endumeni	KZN241	B3	10 587	58 956	46 122 206	1 371 628	12 189 205	5 643
Nquthu	KZN242	B4	23 610	187 406	30 706 891	877 776	22 947 548	2 318
Msinga	KZN244	B4	31 145	208 431	37 239 095	1 157 893	12 865 238	1 653
Umvoti	KZN245	B3	21 682	256 969	74 832 731	2 809 162	11 046 573	4 102
Umsinyathi	DC24	C2	87 024	122 587	26 804 906	4 179 734	11 866 113	494
Newcastle	KZN252	B1	55 809	211 084	100 272 732	1 474 705	108 396 647	3 769
Emadlangeni	KZN253	B3	3 930	172 719	16 100 518	509 124	4 054 413	5 303
Dannhauser	KZN254	B4	15 018	184 422	19 790 412	558 349	11 374 136	2 125
Amajuba	DC25	C2	74 756	121 818	25 910 749	3 590 546	6 234 949	480
eDumbe	KZN261	B3	11 942	239 571	42 018 231	1 547 273	6 927 340	4 248
uPhongolo	KZN262	B4	22 064	213 480	28 374 283	820 278	23 922 956	2 417
Abaqulusi	KZN263	B3	30 395	237 549	115 494 277	3 938 081	23 758 671	4 719
Nongoma	KZN265	B4	24 139	179 180	33 434 169	897 431	28 761 801	2 621
Ulundi	KZN266	B4	23 437	187 347	33 979 541	871 355	38 088 157	3 120
Zululand	DC26	C2	111 978	135 728	36 639 227	5 378 281	24 724 346	597
Umkhlabuyalingana	KZN271	B4	27 709	218 824	34 088 248	1 030 149	14 427 533	1 796
Jozini	KZN272	B4	29 673	201 193	38 292 525	1 103 189	23 025 408	2 110

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The Big 5 False Bay	KZN273	B3	6 335	203 154	21 607 413	820 793	2 634 870	3 988
Hlabisa	KZN274	B4	8 881	178 974	12 468 030	330 160	6 836 163	2 231
Mtubatuba	KZN275	B3	25 488	210 236	96 012 857	3 302 260	8 494 427	4 238
Umkhanyakude	DC27	C2	98 086	193 465	30 519 091	4 711 043	10 659 692	470
Mfolozi	KZN281	B4	18 952	180 026	25 956 131	704 594	13 439 711	2 125
uMhlathuze	KZN282	B1	48 390	209 456	104 836 168	1 278 682	80 724 478	3 865
Ntambanana	KZN283	B4	9 288	189 598	12 355 641	345 308	5 534 677	1 984
uMlalazi	KZN284	B4	32 653	204 293	44 536 526	1 213 982	36 244 876	2 517
Mthonjaneni	KZN285	B3	7 524	204 819	26 972 659	974 855	4 292 193	4 312
Nkandla	KZN286	B4	15 821	194 136	21 506 411	588 196	16 635 877	2 460
Uthungulu	DC28	C2	132 629	149 656	47 828 865	6 370 160	11 203 487	494
Mandeni	KZN291	B4	29 251	215 079	38 781 448	1 087 489	33 617 350	2 520
Kwa Dukuza	KZN292	B2	48 732	218 848	204 910 158	7 474 883	59 150 598	5 577
Ndwedwe	KZN293	B4	22 518	203 697	28 732 106	837 182	10 613 354	1 793
Maphumulo	KZN294	B4	15 271	206 100	19 123 406	567 744	11 128 993	2 032
iLembe	DC29	C2	115 772	168 733	38 065 528	5 560 533	18 288 961	536
Ingwe	KZN431	B4	18 020	246 833	22 440 955	669 938	14 569 182	2 105
Kwa Sani	KZN432	B3	2 441	163 853	9 437 058	316 261	3 557 255	5 520
Greater Kokstad	KZN433	B2	12 026	197 779	50 833 904	1 844 617	41 845 044	7 876
Ubuhlebezwe	KZN434	B4	18 205	133 140	22 904 736	676 821	24 766 216	2 663
Umzimkhulu	KZN435	B4	35 228	289 378	42 492 378	1 309 716	26 596 154	2 007
Sisonke	DC43	C2	85 920	167 413	26 012 639	4 126 730	12 693 150	500
<b>Mpumalanga</b>								
Albert Luthuli	MP301	B4	35 736	217 248	47 438 127	1 328 576	47 243 271	2 693
Msukaligwa	MP302	B2	25 048	178 957	116 037 918	3 841 982	36 447 569	6 248
Mkhondo	MP303	B3	27 489	179 565	102 100 472	3 561 507	25 771 862	4 788
Pixley Ka Seme	MP304	B3	13 719	119 004	52 014 215	1 777 418	15 191 204	5 037
Lekwa	MP305	B3	17 699	181 880	83 320 391	2 293 165	15 677 174	5 733
Dipaleseng	MP306	B3	8 159	253 861	34 426 295	1 057 152	11 198 529	5 752
Govan Mbeki	MP307	B1	45 743	146 674	102 682 529	1 208 733	52 642 900	3 425
Gert Sibande	DC30	C1	173 593	138 329	110 935 083	4 982 329	15 672 832	759
Victor Khanye	MP311	B3	13 196	225 807	57 535 542	1 709 702	15 052 739	5 647
Emalahleni	MP312	B1	61 347	143 687	151 622 157	1 621 068	56 654 358	3 424
Steve Tshwete	MP313	B1	32 480	144 753	84 072 900	858 261	42 511 102	3 928
Emakhazeni	MP314	B2	8 727	210 317	39 090 661	1 338 587	19 962 016	6 944
Thembisile	MP315	B4	52 070	200 662	76 550 324	1 935 853	29 959 385	2 087
Dr J.S. Moroka	MP316	B4	45 726	196 234	61 366 424	1 699 991	28 998 148	2 018
Nkangala	DC31	C1	213 546	121 634	148 546 177	6 129 040	16 017 523	800
Thaba Chweu	MP321	B3	22 250	185 269	93 853 981	2 882 688	15 236 013	5 041
Mbombela	MP322	B1	102 611	216 205	200 359 566	2 711 431	78 664 346	2 748
Umjindi	MP323	B3	12 683	200 211	55 728 520	1 643 195	10 814 872	5 392
Nkomazi	MP324	B4	75 363	237 393	96 890 095	2 801 852	113 207 789	2 828
Bushbuckridge	MP325	B4	107 789	200 669	134 185 290	4 007 362	125 573 586	2 449
Ehlanzeni	DC32	C1	320 696	137 237	182 288 281	9 204 363	28 235 307	686
<b>Limpopo</b>								

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Greater Giyani	LIM331	B4	51 561	243 079	63 542 071	1 916 929	43 847 958	2 125
Greater Letaba	LIM332	B4	48 556	236 378	58 062 025	1 805 212	38 043 021	2 021
Greater Tzaneen	LIM333	B4	84 077	226 142	110 141 410	3 125 790	78 282 841	2 281
Ba-Phalaborwa	LIM334	B3	26 714	196 481	112 563 897	3 461 135	22 006 500	5 174
Maruleng	LIM335	B4	20 075	244 676	24 654 324	746 353	21 625 457	2 355
Mopani	DC33	C2	230 983	134 661	70 759 575	11 094 099	36 253 404	512
Musina	LIM341	B3	16 263	247 860	57 897 787	2 107 045	13 768 884	4 552
Mutale	LIM342	B4	19 546	234 271	24 190 172	726 665	18 272 010	2 222
Thulamela	LIM343	B4	124 228	230 962	157 735 891	4 618 526	100 543 711	2 118
Makhado	LIM344	B4	103 762	224 041	135 841 068	3 857 661	123 426 302	2 538
Vhembe	DC34	C2	263 799	160 420	80 482 921	12 670 223	67 383 311	609
Blouberg	LIM351	B4	33 705	249 301	40 605 636	1 253 065	20 298 451	1 852
Aganang	LIM352	B4	26 394	263 928	33 086 950	981 278	14 578 510	1 853
Molemole	LIM353	B4	23 488	237 489	29 409 853	873 239	16 380 523	1 997
Polokwane	LIM354	B1	117 875	214 220	221 385 330	3 114 781	74 893 323	2 542
Lepele-Nkumpi	LIM355	B4	45 504	169 543	59 342 770	1 691 747	39 519 958	2 214
Capricorn	DC35	C2	246 966	155 069	82 229 602	11 861 775	37 926 717	535
Thabazimbi	LIM361	B3	12 518	143 030	67 423 387	1 621 884	15 320 261	6 751
Lephalale	LIM362	B3	17 694	177 393	83 568 520	2 292 475	15 683 582	5 749
Mookgophong	LIM364	B3	6 936	228 701	27 101 478	898 635	10 140 698	5 532
Modimolle	LIM365	B3	10 258	212 055	45 654 530	1 329 012	11 289 006	5 701
Bela Bela	LIM366	B3	11 974	229 970	50 472 768	1 551 342	13 954 634	5 529
Mogalakwena	LIM367	B2	57 968	208 144	219 120 163	8 891 641	53 569 156	4 861
Waterberg	DC36	C1	117 348	117 379	72 808 960	3 368 042	13 679 169	767
Ephraim Mogale	LIM471	B4	27 004	254 511	32 986 938	1 003 966	29 275 802	2 352
Elias Motsoaledi	LIM472	B4	47 251	217 457	61 474 997	1 756 674	42 847 093	2 250
Makhudutamaga	LIM473	B4	52 752	232 986	65 567 746	1 961 207	25 280 979	1 764
Fetakgomo	LIM474	B4	16 729	253 138	22 896 075	621 943	13 256 569	2 213
Greater Tubatse	LIM475	B4	60 062	208 318	87 567 049	2 232 994	27 955 765	1 964
Greater Sekhukhune	DC47	C2	203 798	176 201	64 153 734	9 788 409	31 459 751	518
<b>North West</b>								
Moretele	NW371	B4	38 650	255 225	50 717 898	1 436 914	18 635 675	1 838
Madibeng	NW372	B1	103 196	215 959	201 622 688	2 726 892	47 199 320	2 440
Rustenburg	NW373	B1	109 391	197 998	251 823 310	2 890 577	240 167 268	4 526
Kgetlengrivier	NW374	B3	10 708	264 620	39 860 701	1 387 368	8 486 313	4 669
Moses Kotane	NW375	B4	51 100	206 819	73 592 219	1 899 778	43 363 795	2 330
Bojanala Platinum	DC37	C1	313 044	91 334	207 605 359	8 984 761	32 328 070	795
Ratlou	NW381	B4	21 759	271 269	26 086 877	808 953	20 287 848	2 181
Tswaing	NW382	B3	22 188	234 334	80 470 037	2 874 722	12 126 868	4 313
Mafikeng	NW383	B2	55 301	217 487	231 835 946	8 482 546	49 699 304	5 248
Ditsobotla	NW384	B3	29 718	173 090	117 505 087	3 850 365	27 825 375	5 026
Ramotshere Moiloa	NW385	B3	29 686	254 208	107 965 617	3 846 117	14 975 504	4 280
Ngaka Modiri Molema	DC38	C2	158 652	198 688	53 045 344	7 620 066	28 073 817	561
Naledi	NW392	B3	11 897	222 843	49 339 966	1 541 437	17 368 692	5 755
Mamusa	NW393	B3	10 530	254 093	39 412 706	1 364 274	10 986 429	4 940

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Greater Taung	NW394	B4	38 229	242 684	47 223 226	1 421 255	36 293 893	2 228
Lekwa-Teemane	NW396	B3	10 012	225 361	40 274 772	1 297 200	12 930 688	5 466
Kagisano + Molopo	NW397	B4	22 287	252 693	27 605 201	828 600	12 844 063	1 863
Dr Ruth Segomotsi Mompoti	DC39	C2	92 955	155 147	29 150 681	4 464 642	7 789 970	447
Ventersdorp	NW401	B3	10 715	207 575	38 817 841	1 388 300	8 081 179	4 526
Tlokwe	NW402	B1	31 684	189 865	65 568 864	837 221	47 020 858	3 586
City Of Matlosana	NW403	B1	72 298	191 143	143 284 296	1 910 416	90 527 290	3 263
Maquassi Hills	NW404	B3	14 893	241 430	53 710 373	1 929 510	13 856 048	4 683
Dr Kenneth kaunda	DC40	C1	129 589	128 256	83 717 878	3 719 372	13 698 047	781
<b>Gauteng</b>								
Ekurhuleni Metro	EKU	A	575 090	270 988	1 210 908 729	29 580 844	970 940 063	3 846
City Of Johannesburg	JHB	A	772 245	254 086	1 726 571 972	39 721 907	1 676 917 432	4 459
City Of Tshwane	TSH	A	455 057	231 592	1 108 775 259	23 406 747	1 071 956 625	4 844
Emfuleni	GT421	B1	134 376	309 823	264 864 372	3 550 788	336 717 003	4 506
Midvaal	GT422	B2	17 074	185 005	87 740 482	2 618 927	29 605 680	7 037
Lesedi	GT423	B3	18 227	184 027	84 834 207	2 361 475	16 265 658	5 686
Sedibeng	DC42	C1	169 676	141 252	114 011 441	4 869 916	57 887 414	1 043
Mogale City	GT481	B1	69 067	213 404	145 723 500	1 825 051	83 559 765	3 349
Randfontein	GT482	B2	22 769	177 178	120 698 066	3 492 542	43 849 475	7 388
Westonaria	GT483	B2	25 642	217 302	114 196 093	3 933 160	32 310 043	5 875
Merafong City	GT484	B2	33 716	169 433	185 256 610	5 171 677	55 931 251	7 312
West Rand	DC48	C1	151 195	126 817	109 607 673	4 339 478	29 462 909	949
<b>Total</b>				<b>54 990 239</b>	<b>24 005 446 651</b>	<b>789 254 869</b>	<b>14 838 077 087</b>	



