

COMPARISON OF DEVELOPMENT CONTRIBUTION MODELS USED BY CITY POWER



Author & Presenter: G Jardine B-Tech: Elec Eng – Senior Engineer at City Power

1. Introduction

When it comes to providing infrastructure assets to service customers in a Municipality, section 73(2)(c) of the Municipal Systems Act, states that services must be provided in a financially sustainable manner. Development contributions is a levy charged when the capacity rights to a land parcel are increased by changing its land use. The fee is designed to recover the capital cost of the infrastructure assets required to meet the increase in demand on the existing or planned external engineering services, and to ensure that the main beneficiaries of infrastructure make an appropriate and fair contribution to that cost, without unduly burdening other ratepayers. The paper will compare three models to calculate the development contribution for a land parcel.

2. Background

The calculation of development contributions is the product of the unit impact and the unit cost. The unit impact for electrical service is the ADMD of the land parcel's capacity rights. The ADMD for the various uses were determined using national engineering norms and standards and were validated using land use and consumption data. For example, a property zoned Residential 1, allowing a single freestanding dwelling to be erected will be allocated 5kVA.

The unit cost was derived as follows.

$$\text{Unit Cost} = \frac{\text{Cost of Capital Projects} - \text{Cost of Non-Expansion Projects}}{10 \text{ Year Demand} - \text{Base Demand}}$$

Where:

Cost of Capital Projects is the cost of infrastructure projects that were identified in the network development plans and masterplans to be implemented in the next 10 years to meet the anticipated load growth

Cost of Non-Expansion Projects is the cost of infrastructure projects addressing infrastructure backlogs and the renewal of existing assets that are planned in the next 10 years

10 Year Demand is the anticipated future demand based on the 10-year load forecast

Base Demand is the base demand of the 10-year load forecast

The unit cost works out at a Rand per kVA value and this unit cost was calculated for the various points of connection on the network.

The calculations in the tables for the various models are calculated as follows.

$$\text{Total Cost} = \text{Development Contribution} + \text{Network Capacity fee}$$

Where:

Development Contribution is Entitled Capacity x Unit Cost @ Point of Connection

Network Capacity Fee is the Entitled Capacity x Revised Unit Cost @ Point of Connection

In Model 1, the development contribution uses the primary substation as the point of connection, this means that the contribution only covers the infrastructure from the primary substation and upstream infrastructure. If the land parcel was serviced on infrastructure that was downstream from primary substation, then the pro-rata share of the cost of the distribution and reticulation networks is not recovered.

Model 2 tries to address the short comings and challenges of having a fixed rate for all points of connection. The model uses the point of connection on the network to determine the rate at which the development contribution was calculated. This model charges a lower rate the higher upstream the development was connected, thus allowing for the recovery of the full pro-rata share of its capital investment on the external engineering services. This model also allows developers who have to install link services to connect higher up the network to pay lower contributions.

Around 2010, the decision was made to include a network capacity fee component to the service connection cost. This fee allowed for the recovery the capital cost of the bulk engineering services where the capacity of the service connection exceeded the capacity rights entitled by the zoning.

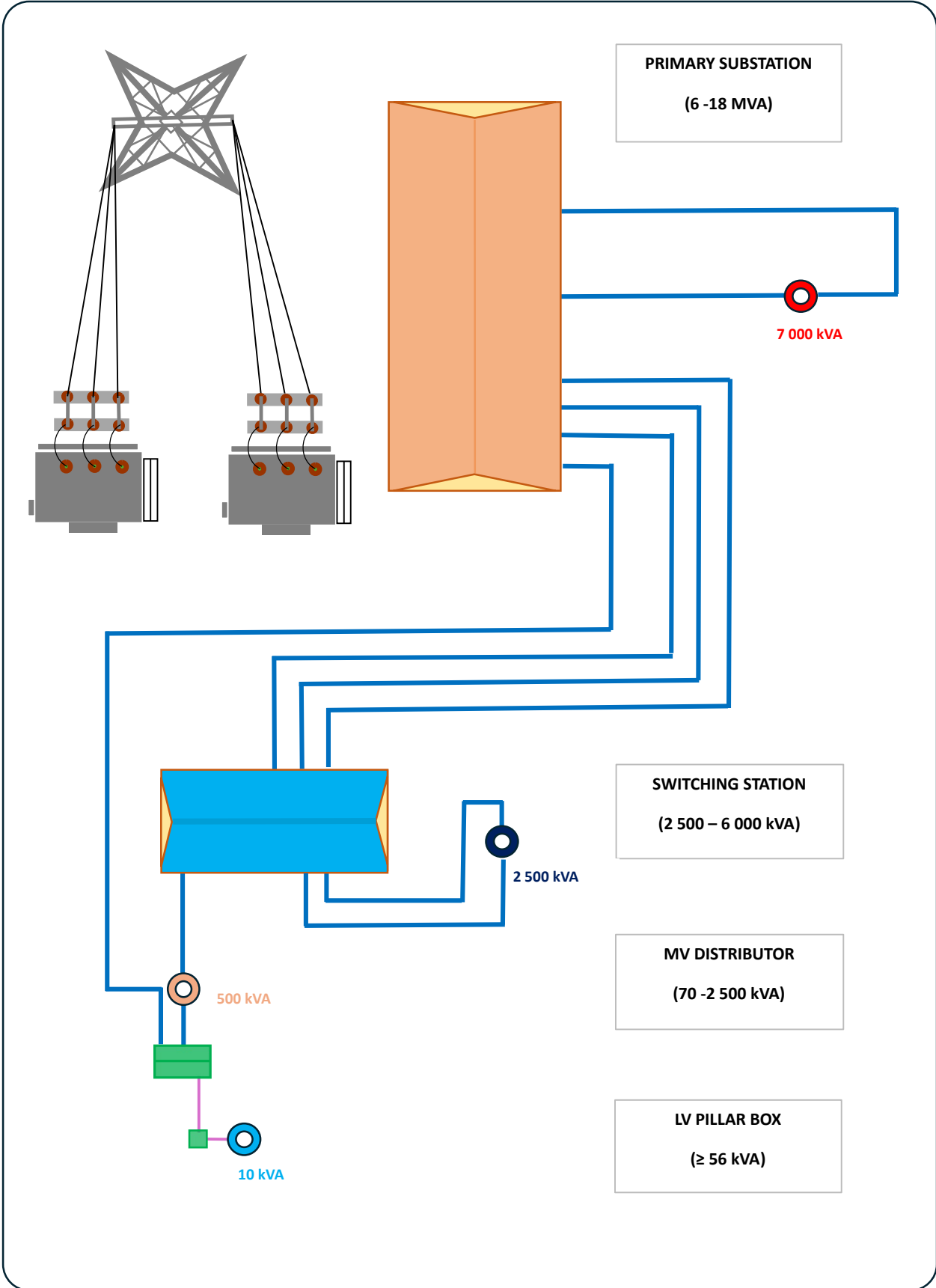
Model 2 has its advantages but there are some gaps that have become recurring problems with it. Model 3 is a hybrid of Model 1 and 2. The development contribution is calculated at the primary substation and a reduced network capacity fee will be charged as part of the service connection. This model should resolve some the problems of Model 2 while keeping it advantages.

3. Case Study

To illustrate the models and the calculation of the development contributions and network capacity fee, four sizes of entitled capacity of the land parcel will be used, these will be 10kVA, 500kVA, 3 000kVA and 7 000kVA. The rates that will be used in the comparison are taken from the City Power 2024/25 approved connection fees. The table below shows where each will be connected on the network.

Entitled Capacity (kVA)	Point Of Connection	Approved 2024/25 Unit Cost (R / kVA)
10	Low voltage network	R 5,065
500	Medium voltage distributor	R 4,035
2,500	Switching station	R 2,900
7,000	Primary substation	R 1,793

The diagram below illustrates the point of connection on the network.



PRIMARY SUBSTATION
(6 - 18 MVA)

7 000 kVA

SWITCHING STATION
(2 500 – 6 000 kVA)

2 500 kVA

MV DISTRIBUTOR
(70 - 2 500 kVA)

500 kVA

LV PILLAR BOX
(≥ 56 kVA)

10 kVA

Using Model 1 to calculate the development contributions for each of these entitled capacities. In this model the development contribution was calculated at the primary substation and there was no network capacity fee charged as part of the service connection

Entitled Capacity (kVA)	Development Contribution	Network Capacity Fee	Total Cost
10	R 17,930	-	R 17,930
500	R 896,500	-	R 896,500
2,500	R 4,482,500	-	R 4,482,500
7,000	R 12,551,000	-	R 12,551,000

Advantages

- The advantage of using this model is that it is easy to calculate the development contribution.

Disadvantages

- The pro-rata cost of the downstream network infrastructure is excluded from the calculation.
- Should the planning tribunal grant a discount on the development contributions it further reduces the recovery of the capital cost to install bulk engineering services.
- If a developer installs link services and requests a rebate, the rebate is taken from pro-rata capital cost of the upstream infrastructure.

Using Model 2 to calculate the development contribution the unit rate will be determined by the point of connection on the network.

Entitled Capacity (kVA)	Development Contribution	Network Capacity Fee	Total Cost
10	R 50,650	-	R 50,650
500	R 2,017,500	-	R 2,017,500
2,500	R 7,250,000	-	R 7,250,000
7,000	R 12,551,000	-	R 12,551,000

Advantages

- The pro-rata share of the capital cost to install the bulk engineering services upstream from the point of connection is recovered.
- It allows developers to get a rebate on link services if the point of connection changes.

Disadvantages

- If a developer installs link services to connect to the network where capacity is available, but the point of connection is unchanged (for e.g. if both points are on the medium voltage network), the model doesn't allow an offset of the development contribution.
- Some developers apply for the electrical service connection prior to the approval of the land parcels new zoning, they are charged the network capacity fee as part of the service connection cost. When the development contribution is calculated, there should be a nil cost, but there are instances where the full development contribution is levied, and the developer pays the development contribution twice.
- Should the planning tribunal grant a discount on the development contributions it further reduces the recovery of the capital cost to install bulk engineering services
- Developers contest the point of connection, and these rebate applications end up at the planning tribunal to adjudicate on the matter and any discount effects the recovery of the capital cost of bulk engineering services.
- It requires the planning engineer to confirm the point of connection so that the development contribution can be calculated.

Model 3 can eliminate some of these disadvantages and make it easier for the development contribution to be determined since the point of connection would be the primary substation. The connection cost and maximum capacity fee are published as part of the connection fees so the cost for the developer can be calculated. The development contribution is calculated using the unit rate for a connection at the primary substation. The network capacity fee unit rate is then determined by using the difference in the unit rates between the downstream points of connection and the primary substation rates.

Entitled Capacity (kVA)	Development Contribution	Network Capacity Fee	Total Cost
10	R 17,930	R32,720	R 50,650
500	R 896,500	R112,1000	R 2,017,500
2,500	R 4,482,500	R276,7500	R 7,250,000
7,000	R 12,551,000	-	R 12,551,000

Advantages

- The capital cost to install the bulk engineering service upstream from the point of connection is recovered.
- It allows developers to get a rebate on link services if the point of connection changes.
- all parties will be able to determine the developer contribution,
- reduce the risk of a developer paying the development contribution twice,
- reduce the number of developers challenging the calculation of development contributions,
- reduce the number of developers requesting an offset/ discount on the development contributions payable,
- allow developers who install link services to connect to the external engineering services to get an offset when the point of connection is unchanged.
- Should the planning tribunal grant a discount on the development contributions it will only impact on the recovery of the capital cost to install bulk engineering services from the primary substation up

Disadvantages

- Where a developer installs the link service the pro-rata share of the capital cost of the services installed may be much less than the network capacity fee, in these cases the developer will have to be charged a portion of the network capacity fee to ensure the pro-rata share of the capital cost of the upstream services are recovered.
- There will have to be a two-tier network capacity fee, once for land parcels with the capacity rights and one for connections exceeding the capacity rights.

The table below shows the under recovery between Model 1 and Models 2 and 3. It makes financial sense to opt for Model 2 or 3.

Entitled Capacity (kVA)	Model 1	Model 2 & 3	Under Recovery
10	R 17,930	R 50,650	R 32,720
500	R 896,500	R 2,017,500	R 1,121,000
2,500	R 4,482,500	R 7,250,000	R 2,767,500
7,000	R 12,551,000	R 12,551,000	-

4. Conclusion

All the models discussed in this comparison have their short comings. Some time after a model is implemented it should be assessed to determine that it is fit for purpose, the once off and repeated problems must be noted, and the model should be reviewed to make improvements to address the problems.

APPENDIX

5. Abbreviations

The definitions of the abbreviations, acronyms and terms used in this paper are as follows;

- **“SPLUMA”** is the Spatial Planning And Land Use Management Act. Act number 16 of 2003
- **“Land use scheme”** is the City of Johannesburg Land Use Scheme of 2018
- **“Planning By-law”** is the City of Johannesburg Municipal Planning by-law of 2016
- **“ADMD”** is the acronym of After Diversification Maximum Demand. ADMD is the simultaneous maximum demand of a group of households divided by the number of consumers, expressed in apparent power (kVA)
- **“bulk engineering services”** means capital infrastructure assets associated with that portion of an external engineering service which is intended to ensure delivery of municipal engineering services for the benefit of multiple users or the community as a whole, whether existing or to be provided as a result of development in terms of a municipal spatial development framework (as defined in the Spatial Planning and Land Use Management Act)
- **“connection fee”** means the connection charge associated with the costs of providing a standard supply, it is designed to recover the cost of providing services to customers.
- **“developer”** means an applicant, as defined in the Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013), whose land development application is approved, in whole or in part, by the person or body authorised to do so in terms of applicable legislation;
- **“development contribution”** means a charge levied by a Municipal Planning Tribunal or authorised official in terms of section 40(7)(b) of, and contemplated in section 49 of, the Planning and Land Use Management Act, which must -
 - contribute towards the cost of capital infrastructure assets needed to meet increased demand for existing and planned external engineering services;
 - with the approval of the Minister, contribute towards capital infrastructure assets needed to meet increased demand for other municipal engineering services not prescribed in terms of the Spatial Planning and Land Use Management Act

- **“engineering service”** means a system for the provision of water, sewerage, electricity, municipal roads, storm water drainage, gas and solid waste collection and removal required for the purpose of land development
- **“entitled capacity”** means the capacity allocated to a land parcel based on the approved zoning i.e. the impact the zoning will have on the bulk engineering services
- **“external engineering service”** means an engineering service situated outside the boundaries of a land area and which is necessary to serve the use and development of the land area
- **“internal engineering service”** means an engineering service within the boundaries of a land area which is necessary for the use and development of the land area and which is to be owned and operated by the municipality or service provider
- **“link engineering service”** means an external engineering service required to connect an internal engineering service to a bulk engineering service and includes the land required for the link engineering service
- **“network capacity fee”** means the fee that a developer is charged when the capacity of the connection being applied for exceeds that entitled capacity of the approved zoning of the land parcel
- **“point of connection”** means the electrical node on the electrical network at which the internal / link engineering service is physically connected to City Power’s assets
- **“service connection”** means the physical point on the electrical network where electricity is supplied to the customer
- **“zoning”** when used as a noun, means the set of requirements regulating the development of land and setting out the purposes for which the land may be used ; and the land use development requirements applicable in respect of the said land use, as determined by the this land use scheme