

CITY OF TSHWANE

BUILT ENVIRONMENT PERFORMANCE PLAN



Sub-Section B – Spatial Planning and Targeting

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ACRONYMS

MCA – Multi Criteria Analysis
TOD – Transit Orientated Development
BEPP – Built Environment Performance Plan
CAPEX – Capital Expenditure
CaPS – Capital Planning System
CIDMS – Cities Infrastructure Delivery and Management System (National Treasury)
CIF – Capital Investment Framework
CITP – Comprehensive Integrated Transport Plan
COT – City of Tshwane Metropolitan Municipality
C-PLAN – Gauteng Conservation Plan
DORA – Division of Revenue Act (Act 2 of 2013)
EIM – Economic Impact Module (CaPS)
GDP – Gross Domestic Product
GDS – Growth and Development Strategy
GIS – Geographic Information Systems
GSDF – Gauteng Spatial Development Framework
GVA – Gross Value Added
IDP – Integrated Development Plan
IRPTN – Integrated Rapid Public Transport Network
KPA – Key Performance Area
MFMA – Municipal Financial Management Act
MSCOA – Municipal Standard Chart of Accounts
MSA – Municipal Systems Act (Act 32 of 2000)
MSDF – Metropolitan Spatial Development Framework
MTREF – Medium Term Revenue and Expenditure Framework
NDPG – Neighbourhood Development Partnership Grant
NLTA – National Land Transport Act (Act 5 of 2009)
NSDP – National Spatial Development Perspective
OPEX – Operational Expenditure
RSDF – Regional Spatial Development Framework
SDBIP – Service Delivery and Budget Implementation Plan
SED – Strategic Executive Director
SIPDM – Standard for Infrastructure and Procurement Delivery Management
SHSDP – Sustainable Human Settlement Development Plan
SPLUMA – Spatial Planning and Land Use Management Act (Act 16 of 2013)

UDF – Urban Development / Design Framework

URS – User Requirement Specification

B Spatial Planning and Project Prioritisation

Contextualisation

Spatial targeting is the deliberate focus of a particular action on a particular spatial area, and in a legislative and performance measurement environment it is a useful tool to help achieve objectives more efficiently. Spatial targeting is only possible once the spatial distribution of potential beneficiaries is known as well as the scope of your actions.

In terms of the municipal environment, and specifically the BEPP, spatial targeting therefore refers to the deliberate focus of capital investment in spatially targeted areas in order to achieve municipal objectives more efficiently. Spatial targeting is thus focussed on optimising the spatial distribution of current and future capital investment in terms of the spatial distribution of beneficiary areas, economic nodes and integration zones (current and future).

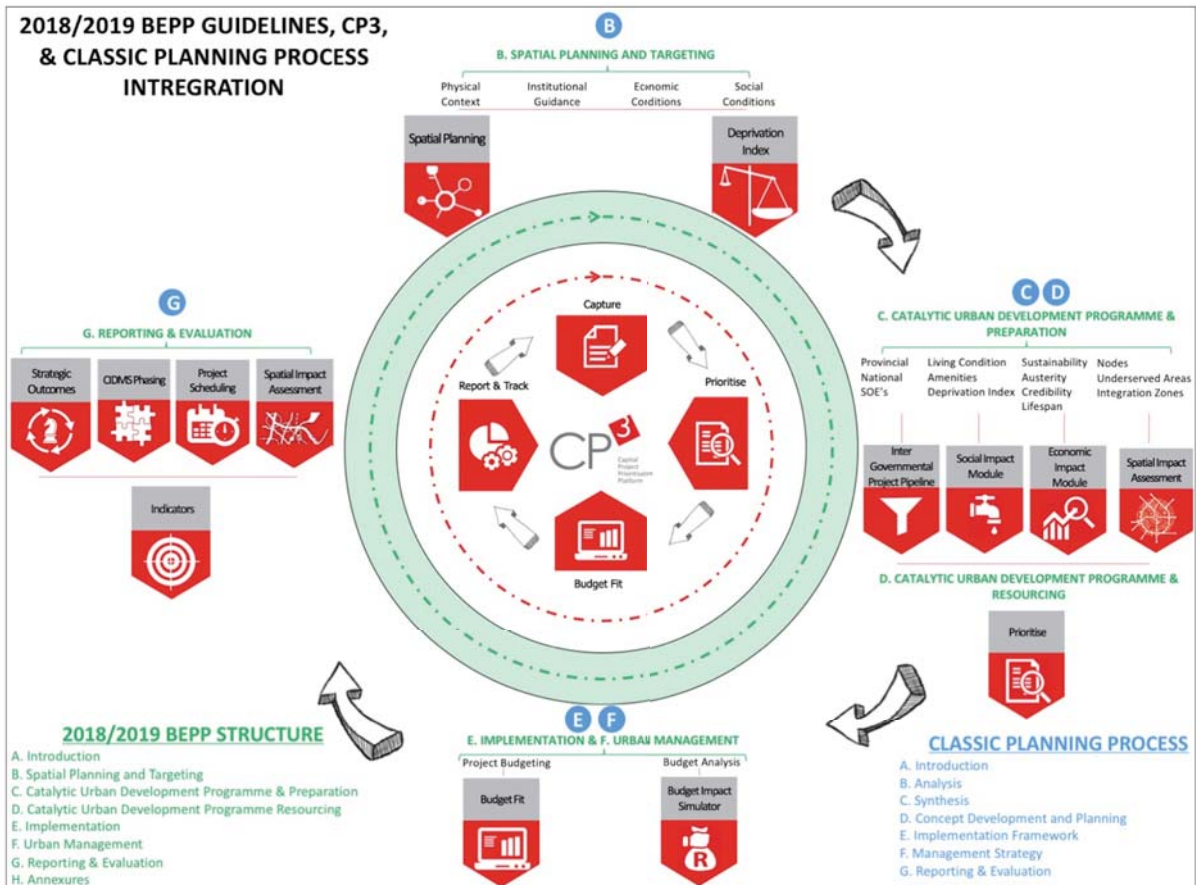
To respond to the National Development Plan 2030 approach towards spatially targeted investment, the City of Tshwane has not only identified Integration Zones but has also included spatial criteria into the Capital Planning and Prioritisation model which will be discussed in this section.

This section is compiled in such a way that it comprises of two components. Firstly, the process of identifying the Urban Network Structure from which spatial targeting areas are derived and secondly, the prioritisation methodology applied to municipal projects across the city in order to strive towards a sustainable and efficient urban form.

Spatial targeting can be best understood using the basic spatial structuring elements¹ of South African cities. This section will start by summarising the City's understanding of the Urban Network Structure, followed by an analysis that describes the City's Urban Network Structure. Once the City's Urban Network Structure has been described, parallels will be drawn between the transport network (IRPTN), household distribution (Human Settlements Plan and CSIR UrbanSim Results) and economic opportunities (City of Tshwane Development trends analysis and CSIR UrbanSim Results). The identification of spatial targeting areas will then be concluded by describing the Integration Zones at the hand of the Urban Network Structure.

Capital planning and project prioritisation is the mechanism that links planning theory to budgeting and implementation. This component of the section deals with the prioritisation methodology and criteria of projects which enables spatial targeting and focussed investment in order to achieve sustainable urban development and efficient capital investment.

¹ Urban Network Structure components as described by the 2018/2019 BEPP Guidelines.



B.1 Spatial Targeting

B.1.1 Urban Network Structure

The Urban Network Strategy (UNS) is a national policy directive² that informs spatial planning at both a provincial and regional scale and forms the basis of the BEPP by providing a spatial approach by which to target investment.

In recognition of the role that cities play in the fulfillment of the key government objectives and to improve the spatial transformation through coordinated public investment, National Treasury developed an Urban Network Strategy³ which enforces a pro-poor/ pro-growth approach to development of cities. This strategy is aimed at the following:

- facilitating the eradication of spatial inequality to enable the creation of liveable, sustainable, resilient, efficient and integrated human settlements; and
- shift infrastructure investments towards the creation of efficient and effective urban centers through an approach of spatial targeting of public investment, primarily infrastructure;
- identification and investment in city-wide interconnected hierarchy of strategic nodes and public transport links between and within nodes.

² National Treasury

³ The Urban Network Strategy (UNS) is a national policy directive that informs spatial planning at both a provincial and regional scale and forms the basis of the Built Environment Performance Plan (BEPP) by providing a spatial approach by which to target investment

The UNS typologies comprises of the following elements:

| Element | Description/function/role |
|------------------------------|--|
| Central Business District | An area for focused regeneration and management. |
| Urban Hubs | Includes both traditional and emerging centres of economic activity, within which mixed used development is to be encouraged and managed. |
| Smaller Nodes | Includes areas of economic activity within which mixed-use development is to be promoted. |
| Activity Corridors | Areas along rapid public transport which connect the urban hubs and the CBD, where high-density land development is to be promoted. |
| Secondary Transport Linkages | Routes that ensure the spatial integration of smaller nodes by connecting them to urban hubs. |
| Integration Zones | Areas which represent a collective of all other typologies and form the prioritised spatial focus areas for coordinated public intervention. |

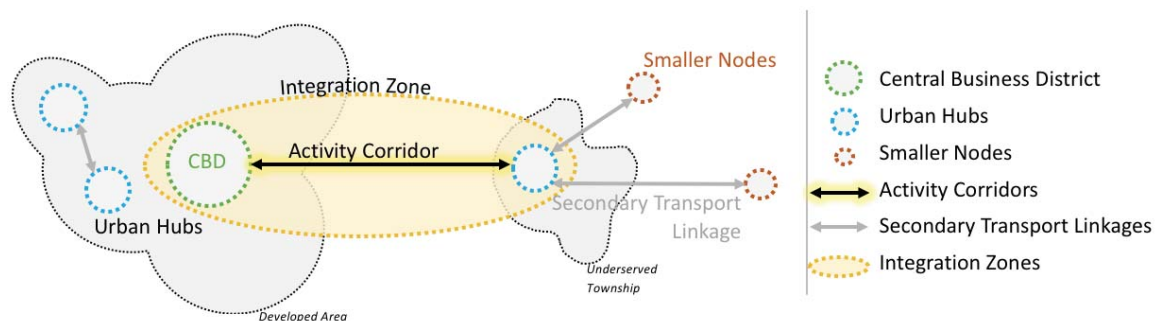


Figure B-1: The Urban Network Typology

B.1.2 Introduction of the City of Tshwane Urban Network

In order to identify the Urban Network Structure of the City, as per the 2018/2019 BEPP guidelines, the following elements will be analysed from which a synthesis will culminate to the City of Tshwane Urban Network Structure:

- Socio-Economic Analysis;
- Transport and movement pattern Analysis; and
- Population distribution and Housing Analysis.

B.1.2.1 Socio-Economic Analysis – Identification of the nodal structure

B.1.2.1.1 Deprivation Index

Basic service delivery, is not only a fundamental function and responsibility of the City but is reiterated on national level within the National Development Plan as the means to which poverty and inequality will be eliminated. The City of Tshwane has developed a Deprivation Index that measures to what extent the residents of the City are deprived of basic services and generally impoverished.

The said Deprivation Index serves to elevate projects which impact underserved areas i.e. the most deprived areas as identified by the Deprivation Index. The Deprivation Index is a spatial layer calculated from Statistics South Africa data at small area level for the Census 2011, which provides an indication of the level of impoverishment or lack of services across the municipality.

The Deprivation Index considers the following indicators:

- Household Income (25%)
- Household Size (5%)
- Household Dwelling Type (5%)
- Household Cooking (10%)
- Household Heat (5%)
- Household Light (5%)
- Household Piped Water (20%)
- Household Toilet (20%)
- Household Refuse Disposal (5%)

The spatial distribution to which the Index is linked, is based on the Municipal Small Places as per Census 2011. The figure below shows the deprived areas in the City of Tshwane as per the above indicators.

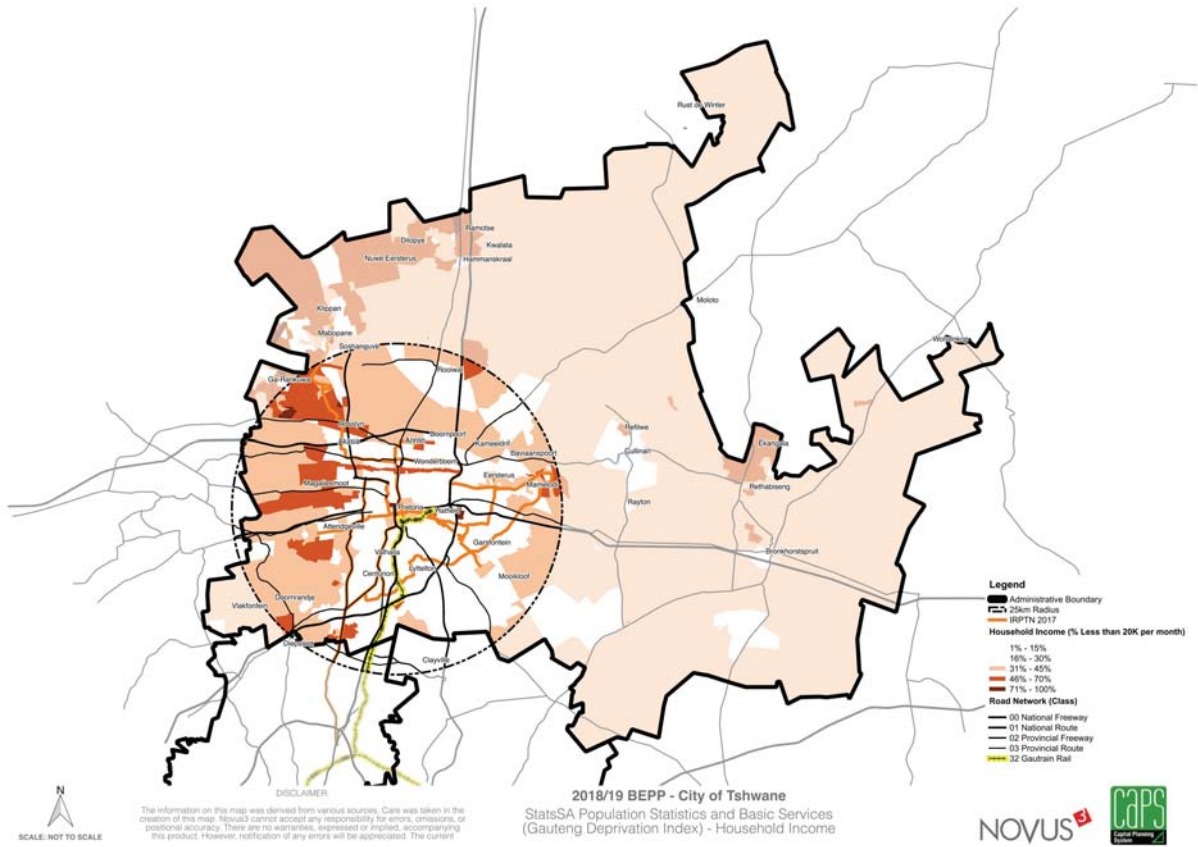


Figure B-2: City of Tshwane distribution of Household Income

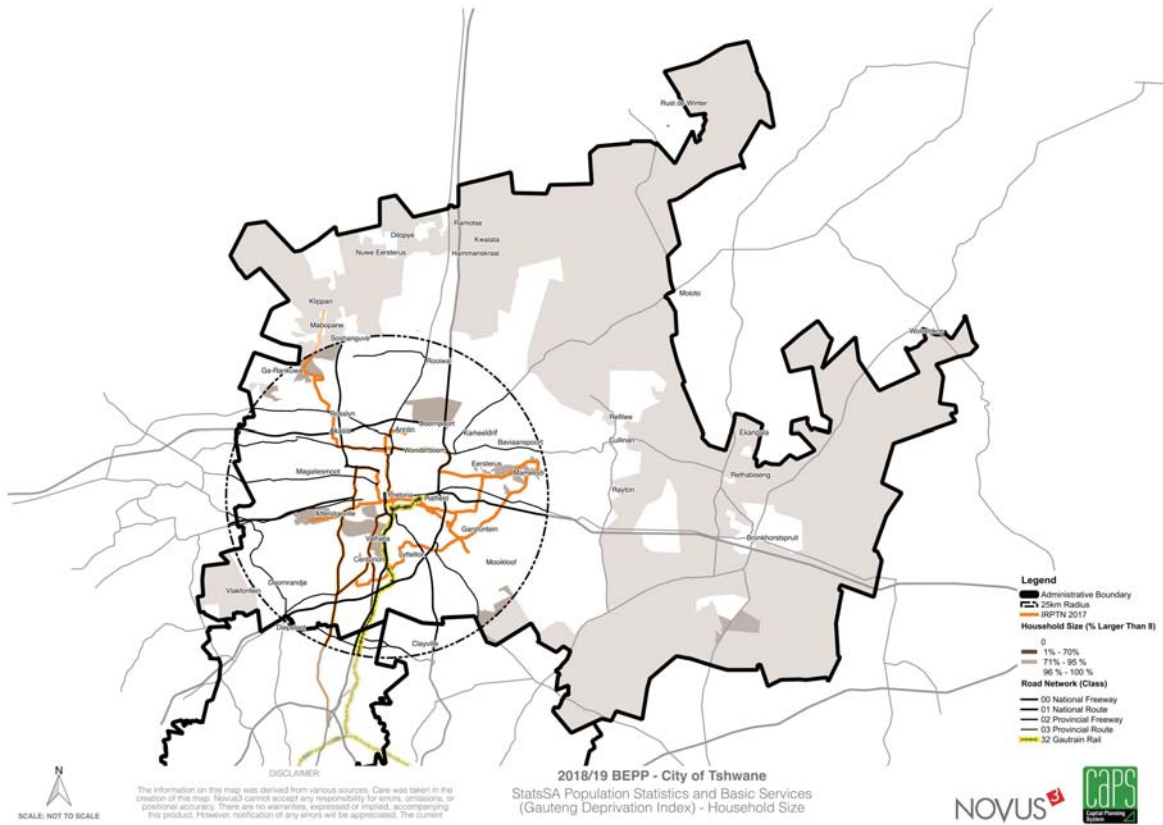


Figure B-3: City of Tshwane distribution of Household Size



Figure B-4: City of Tshwane distribution of Dwelling Type

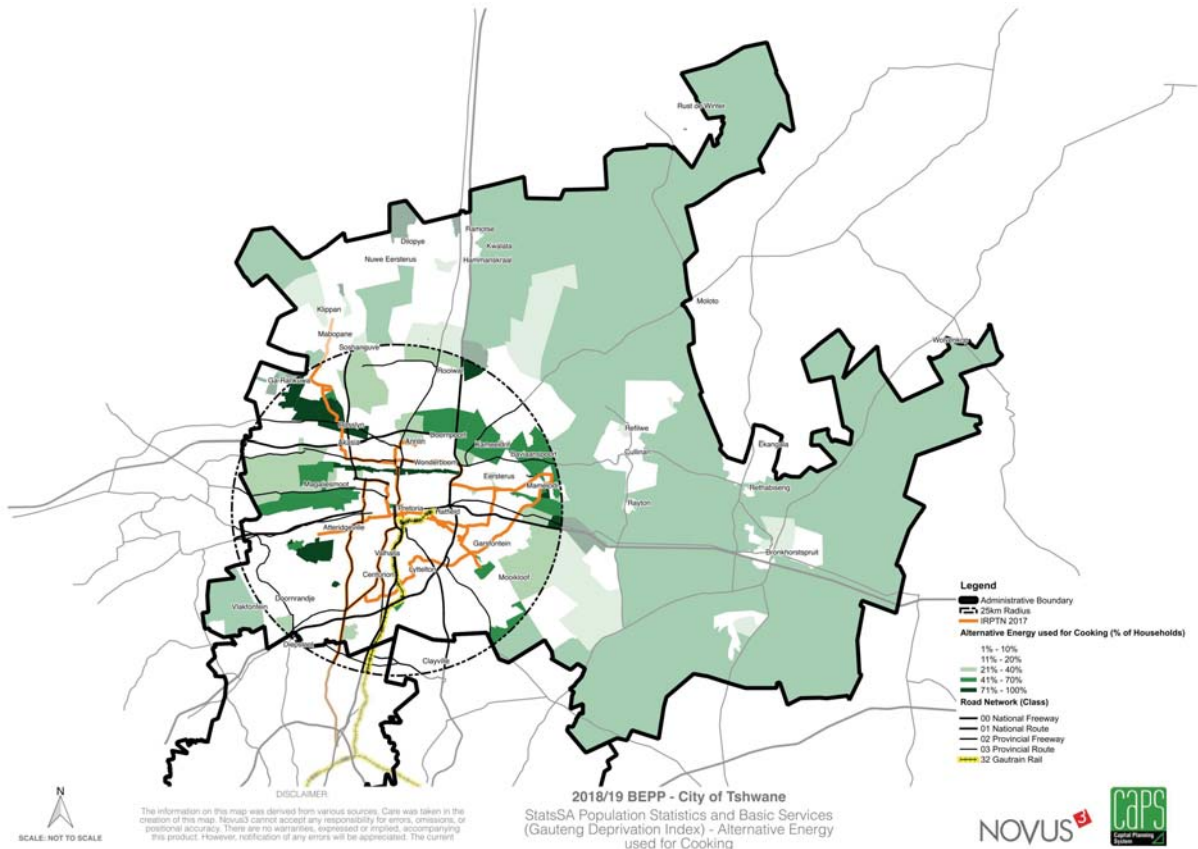


Figure B-5: City of Tshwane distribution of Household Cooking

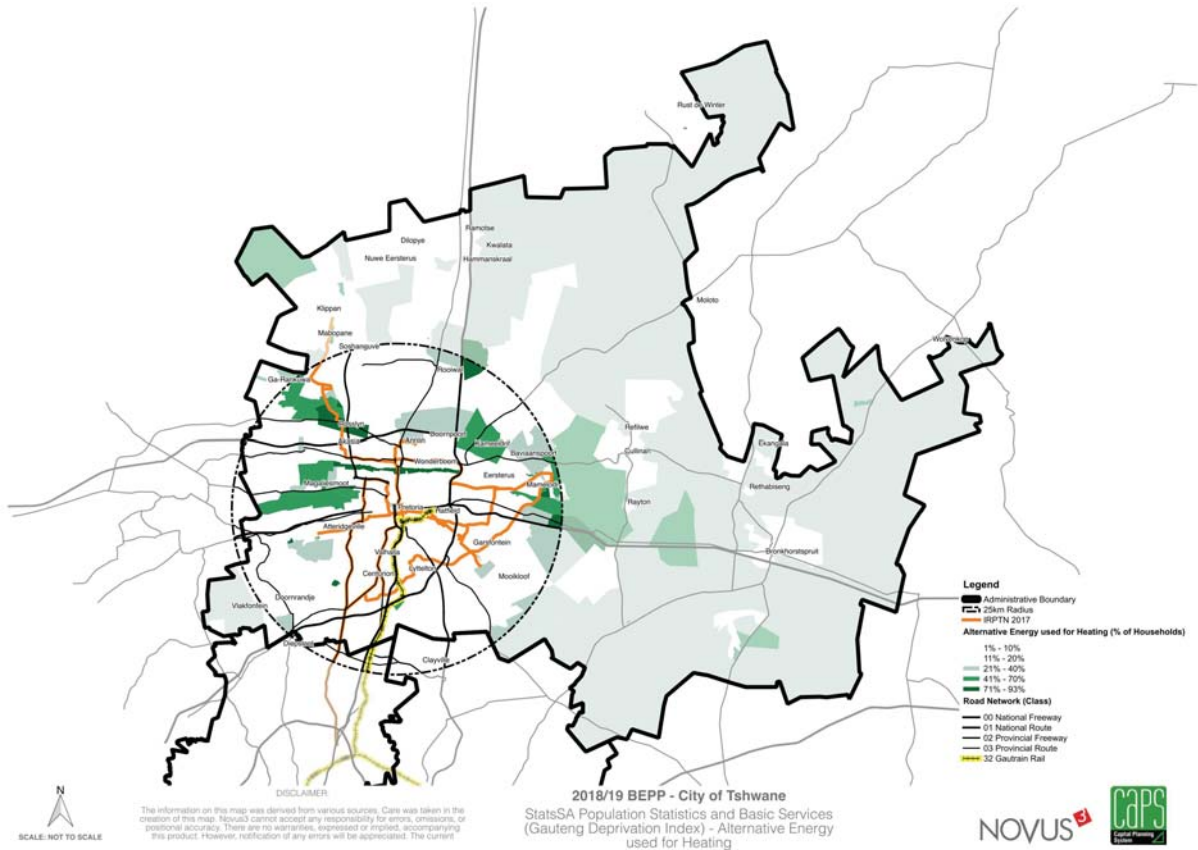


Figure B-6: City of Tshwane distribution of Household Heat

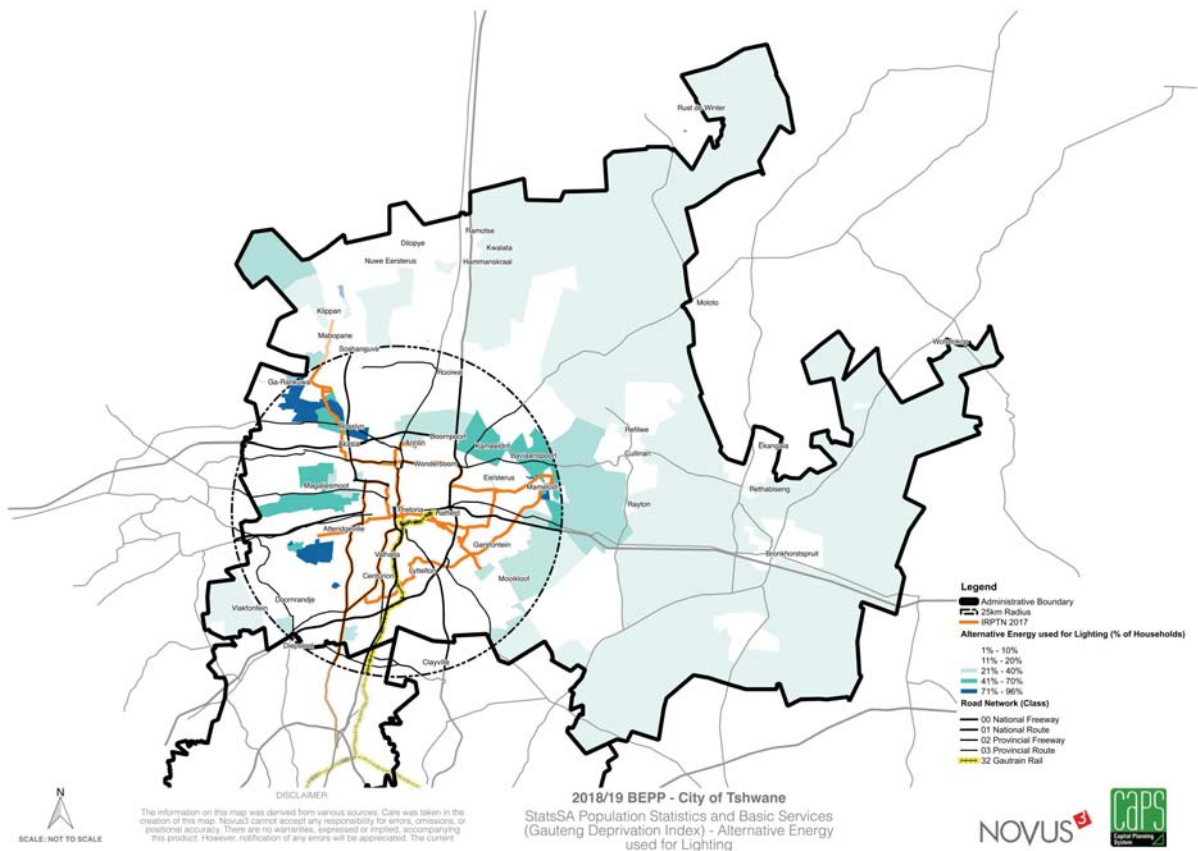


Figure B-7: City of Tshwane distribution of Household Light

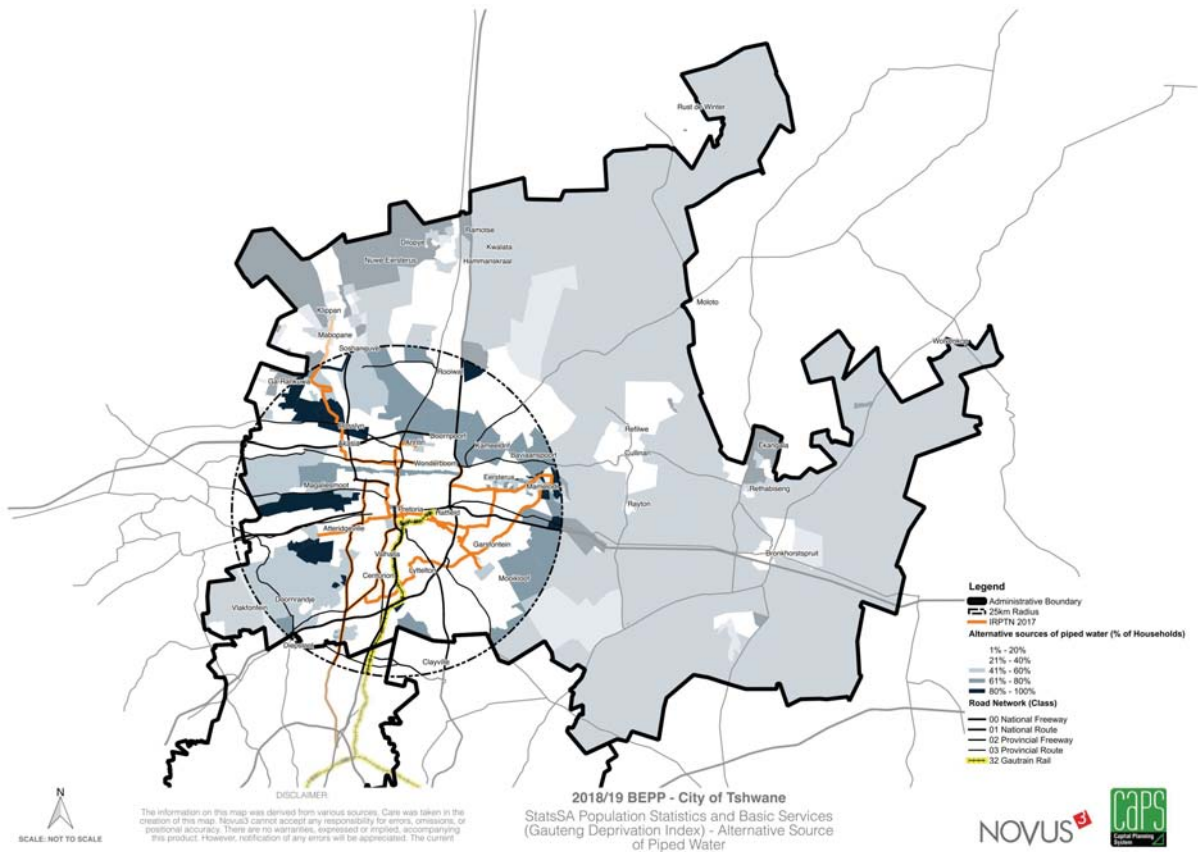


Figure B-8: City of Tshwane distribution of Household Piped Water

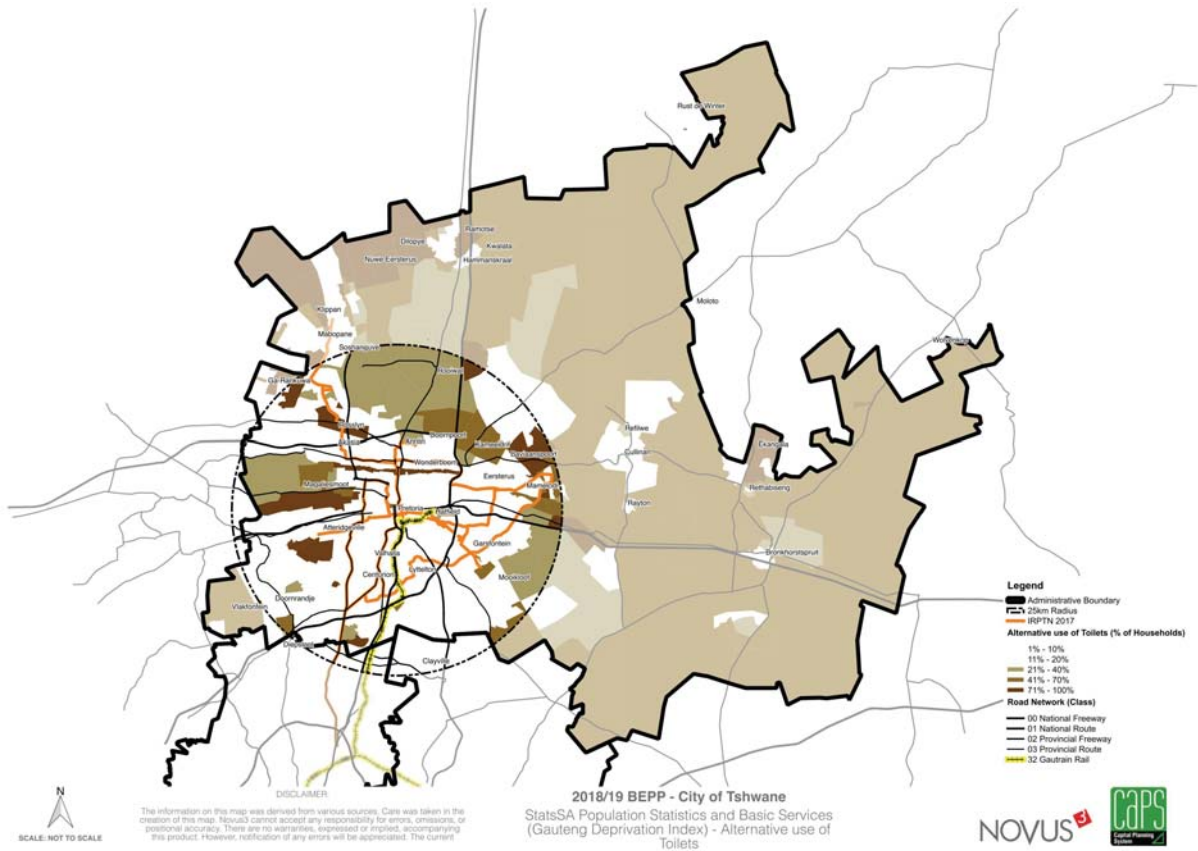


Figure B-9: City of Tshwane distribution of Household Alternative Toilet

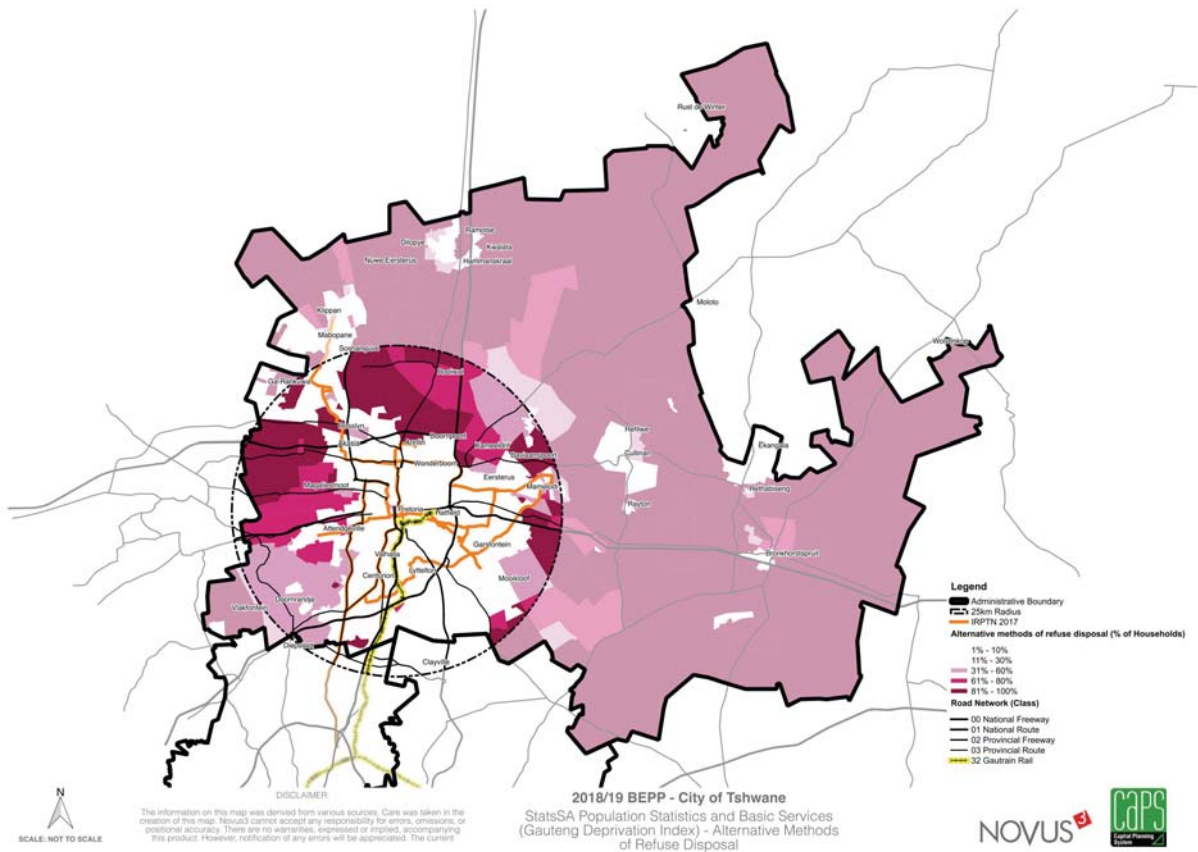


Figure B-10: City of Tshwane distribution of Refuse Disposal

The described indicators are combined based on specific weights in order to build the Deprivation index. The figure below shows the deprived areas in the City of Tshwane as per the combined Index.

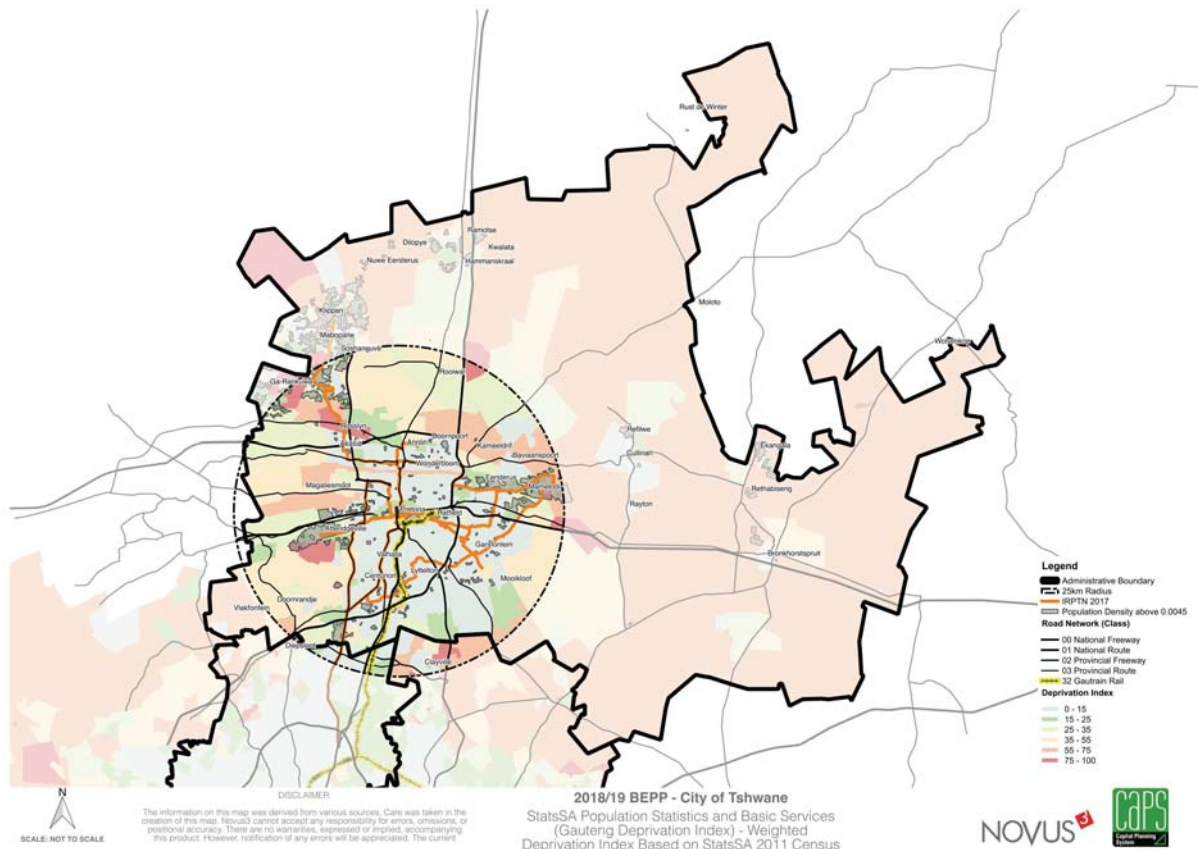


Figure B-11: City of Tshwane distribution of Deprivation Areas

From the figure one can deduce that the Underserved Townships such as Atteridgeville, Temba, Mamelodi, Mabopane and Soshanguve are areas which are the most deprived and, in this context, has the least amount of basic services available. Areas such as the CBD, Pretoria East and Centurion area is of the least deprived areas in the City, with pockets of poverty scattered around the latter grouping of areas.

B.1.2.1.2 Social Facility Needs

The City has conducted an analysis on the distribution of basic social facilities in relation to population distribution. The following basic social facilities were considered in this preliminary analysis⁴:

- Primary Schools
- Secondary Schools
- Community Parks
- Community Library
- Fire Stations
- Ambulance
- Clinics
- District Hospitals

⁴ The City has approached the CSIR to conduct a detailed survey and analysis.

This analysis is based on Christallers Central Place Theory Model which implies some fundamental assumptions which are inaccurate. These assumptions assume amongst others that service provision should be based on proximity and not on travel patterns. The former assume that the determining factor of facility provision is the place of residence whereas the latter assumes the determining factor of facilities as being a function of convenience and preference. It has been found that even though various facilities are provided in underserved areas, they are not being utilised even though they are closest to the population. This typically implies that facilities of preference should rather be expanded and upgraded rather than providing more facilities.

Even though the fundamental approach of Christallers theory is inaccurate, it is still an indication to see if the ratio between population and facility provision are acceptable. The following figures shows the correlation between social facility provision and population distribution.

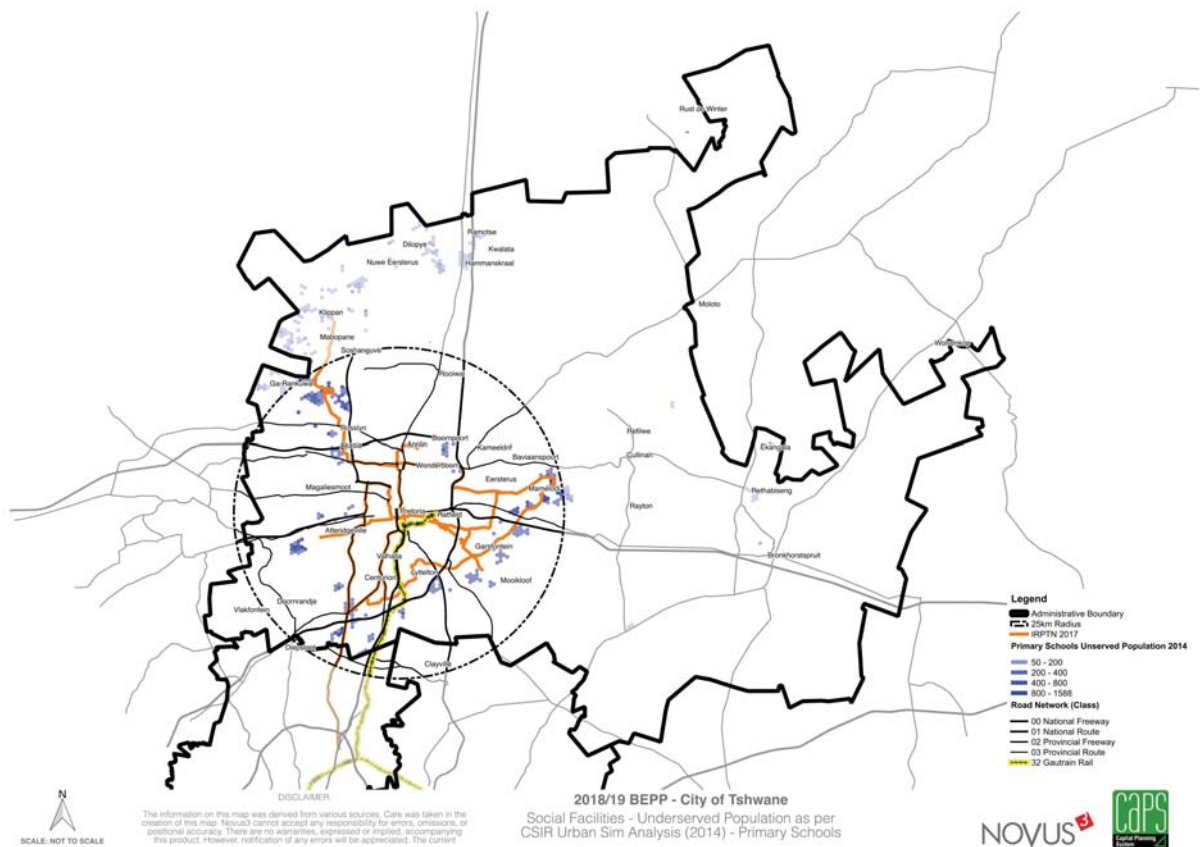


Figure B-12: City of Tshwane population distribution with regards to Primary Schools

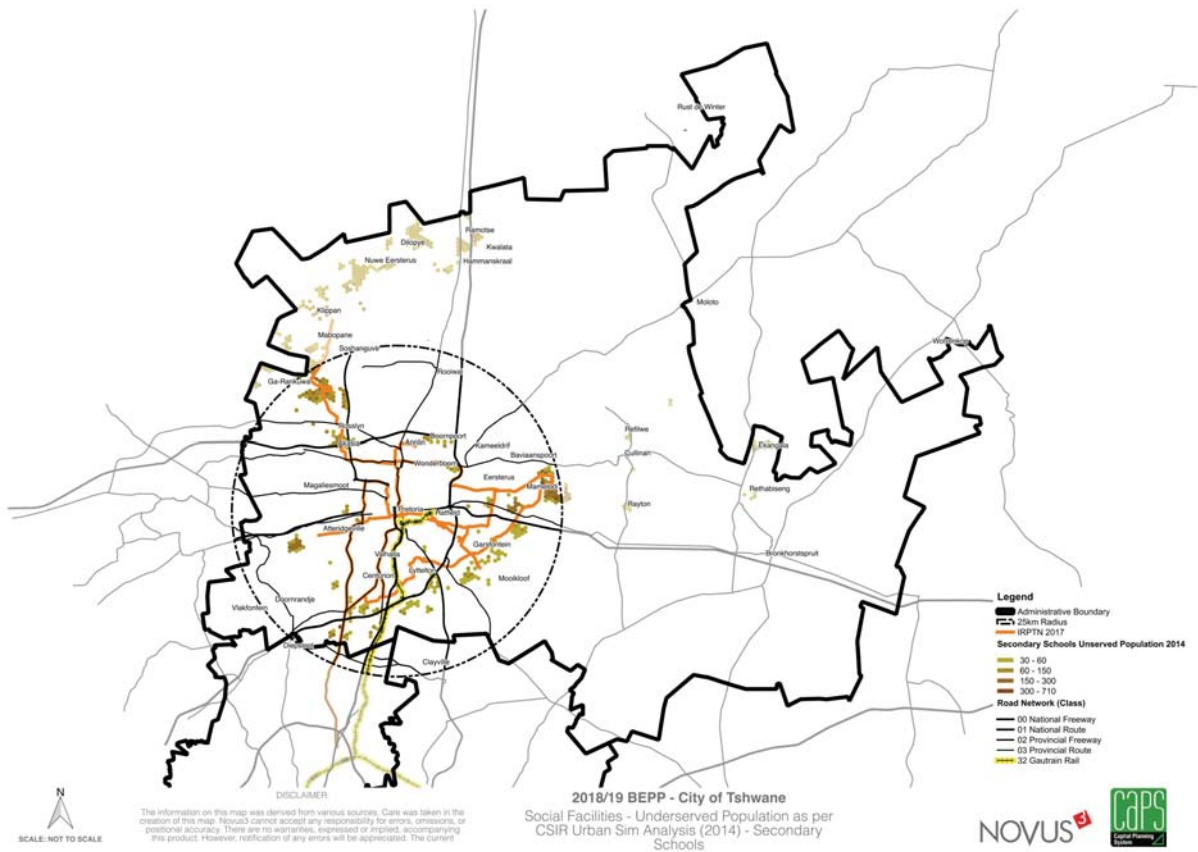


Figure B-13: City of Tshwane population distribution with regards to Secondary Schools



Figure B-14: City of Tshwane population distribution with regards to Community Parks

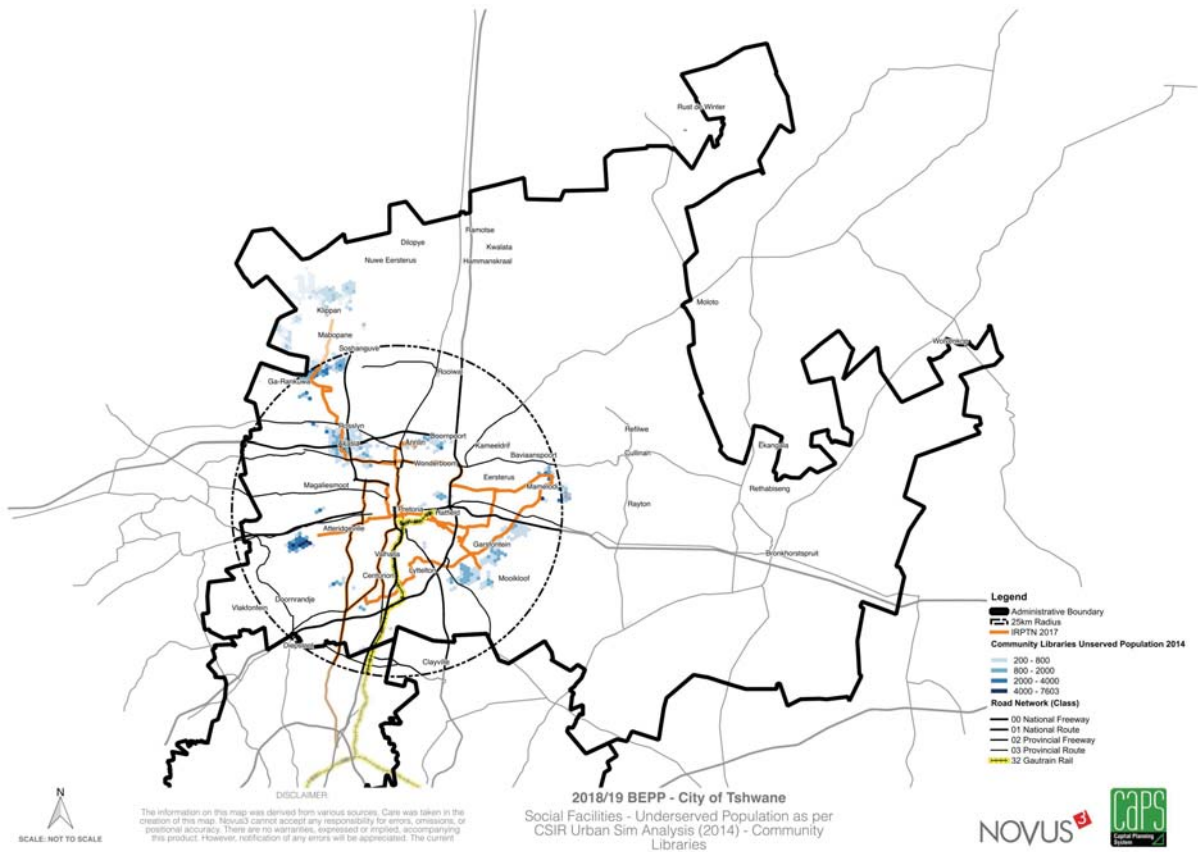


Figure B-15: City of Tshwane population distribution with regards to Community Libraries

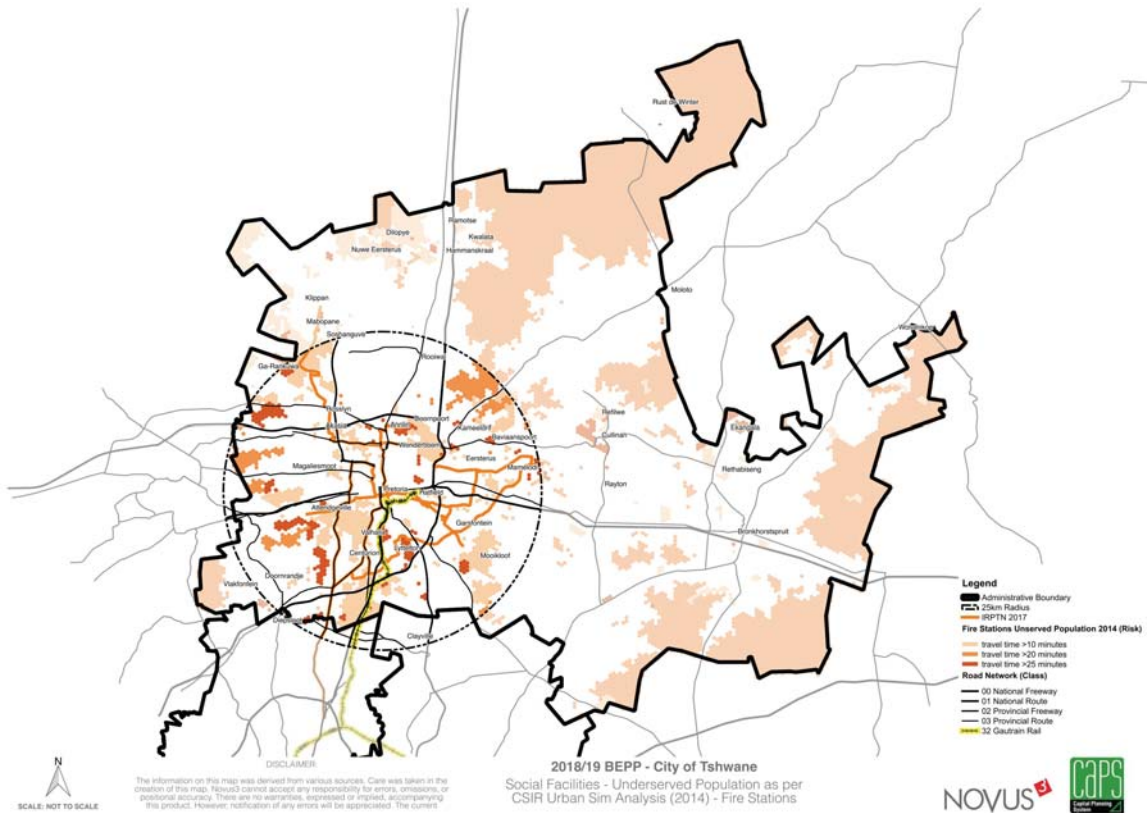


Figure B-16: City of Tshwane population distribution with regards to Fire Stations



Figure B-17: City of Tshwane population distribution with regards to Ambulance Services



Figure B-18: City of Tshwane population distribution with regards to Clinics

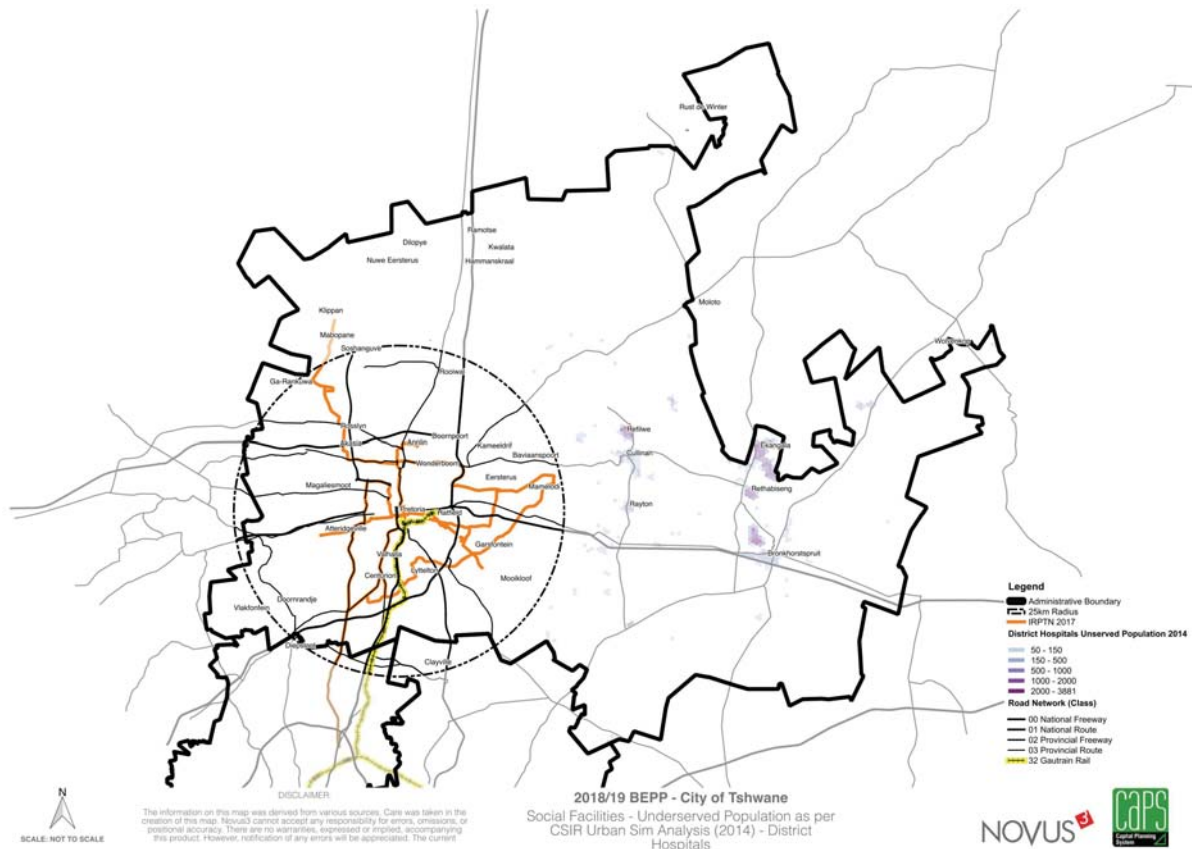


Figure B-19: City of Tshwane population distribution with regards to District Hospitals

B.1.2.1.3 Urban network pressure

In 2016 the CSIR⁵ assisted the City of Tshwane to amongst others identify household distribution and growth in line with the City's spatial agenda as well as economic opportunities that will be created in the same period across the city. The CSIR undertook this exercise with an Urban Simulation Model, otherwise referred to as UrbanSim.

The CSIR's study evaluated three scenarios of which the optimal growth scenario has been accepted for the purpose of this document. The selected scenario, Trend scenario with higher population growth, represents what most stakeholders in the simulation process would regard as a given. This scenario is based on a less conservative demographic and employment projections.

According to the study undertaken by the CSIR, urbanisation, population growth and the provision of economic infrastructure became the key considerations for the 'remaking of the Capital City'. As such, thinking about how to address the future of each of these components to realise a future vision becomes critical.

Current planning directives and tendencies nationwide is focused around people. More so, around people to consume and produce, but mostly to consume. Planning for consumable goods and services is largely based on population and demographic projections as well as

⁵ As part of the UrbanSim

economic opportunities and growth. The Gauteng Spatial Development Framework (GSDF) of 2015 is a long term spatial framework which reflects a vision and projections for the year 2055. One of the most significant projections is that the population of Gauteng will grow from its current population of approximately 13 million people (Statistics South Africa, 2014) to a projected growth of 30 million people. This means requirements for more jobs, more housing, more natural resources, more technology and more infrastructure.

The City of Tshwane has been expanding in a sporadic manner not exclusively due to sprawl, but also due to expanding boundaries between 2001 and 2011. These have been political decisions and not planning decisions. As a result, the city form is sprawled and discontinuous. At a size of 6 368 km² and a population of just over three million people, Tshwane’s population density averages 471 people per km².

Between 1946 and 1996, the geographic area formerly delineated as Tshwane experienced slightly higher population growth as it does now, averaging around 3.7 percent over the 50 years. But then between 1996 and 2001, as in all the other metros of the country, Tshwane experienced a leap of growth, averaging around 18.02 percent the 5 years.

B.1.2.1.3.1 Projected Population Densities

The following figure shows the projected population distribution in the City in 2030.

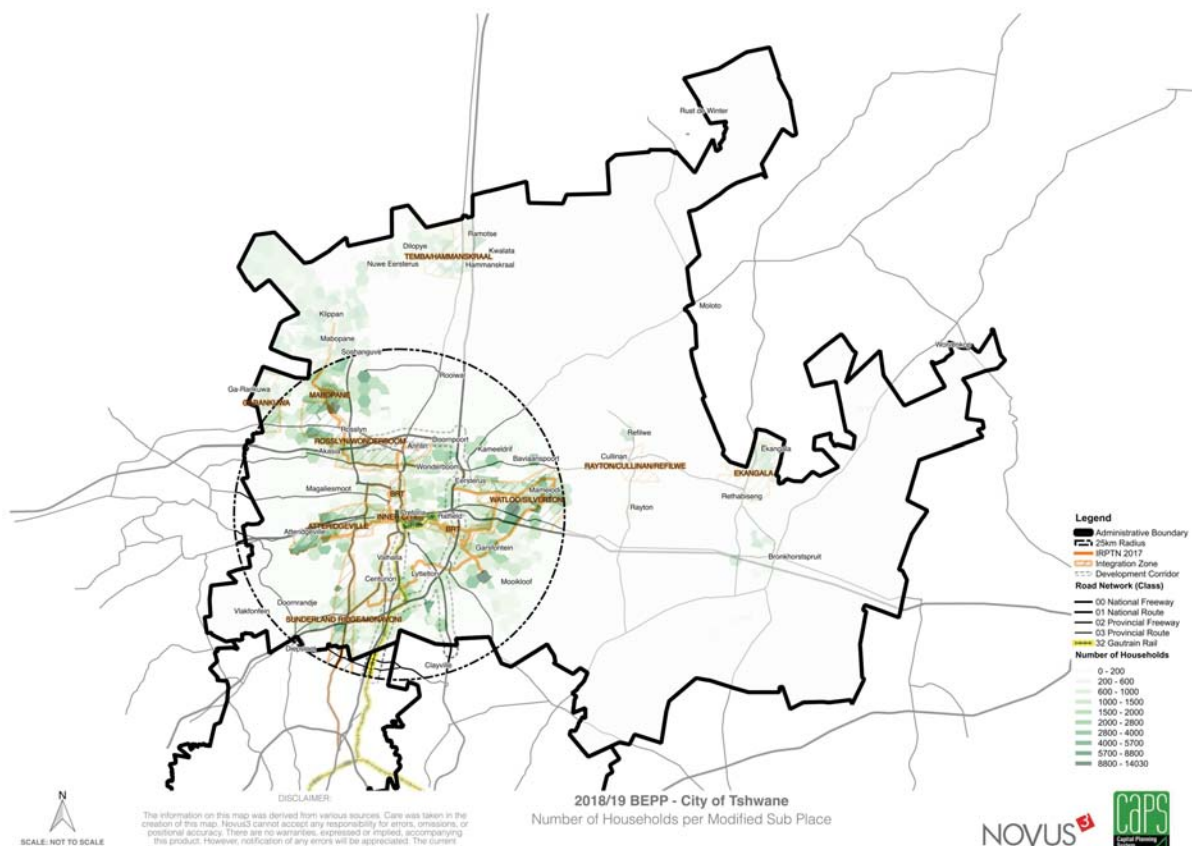


Figure B-20: Number of household per modified sub place, CSIR

According to the results of the urban simulation undertaken by the CSIR, based on the trend (status quo) scenario with higher population growth rates, the following areas are expected to have the highest number of households:

- Atteridgeville
- CBD
- Irene
- Mamelodi
- Mooikloof
- Rosslyn
- Soshanguve
- Temba

The projections made by the CSIR show that the current urban distribution of households will follow current spatial formations, but with higher densities. To understand the areas that is expected to have the highest growth pressures it would be valuable to investigate the expected growth rate across the City.

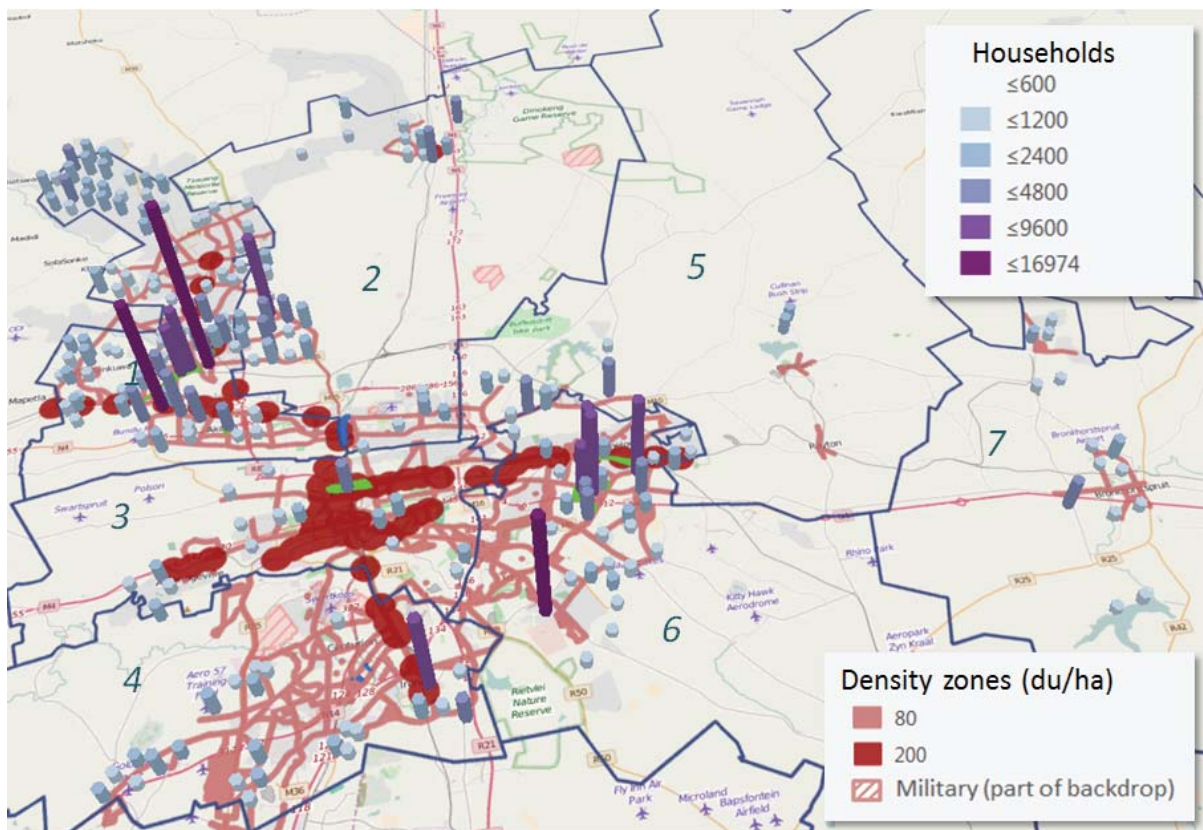


Figure B-21: Projected growth in households per modified sub place between 2011 and 2030,CSIR

The areas identified as the areas with the largest household growth rate between 2011 and 2030 are as follow:

- Irene
- Mamelodi
- Mooikloof
- Rosslyn

- Soshanguve
- Temba
- Winterveldt

The projected growth in households shows clearly that the population density of the city is to expand in the north-western quadrant of the city, as well as on the eastern to south-eastern periphery. To address the urban sprawl to east, and the influx of people to the north, the city will have to intervene in such a way in which the denser household areas are linked to the areas with most employment opportunities to increase the sustainability of the city structure.

B.1.2.1.3.2 Projected Employment Opportunities

The following figure shows the projected employment opportunities in the City. According to the results of the Urban Simulation, based on the trend (status quo) scenario with higher population growth rates.

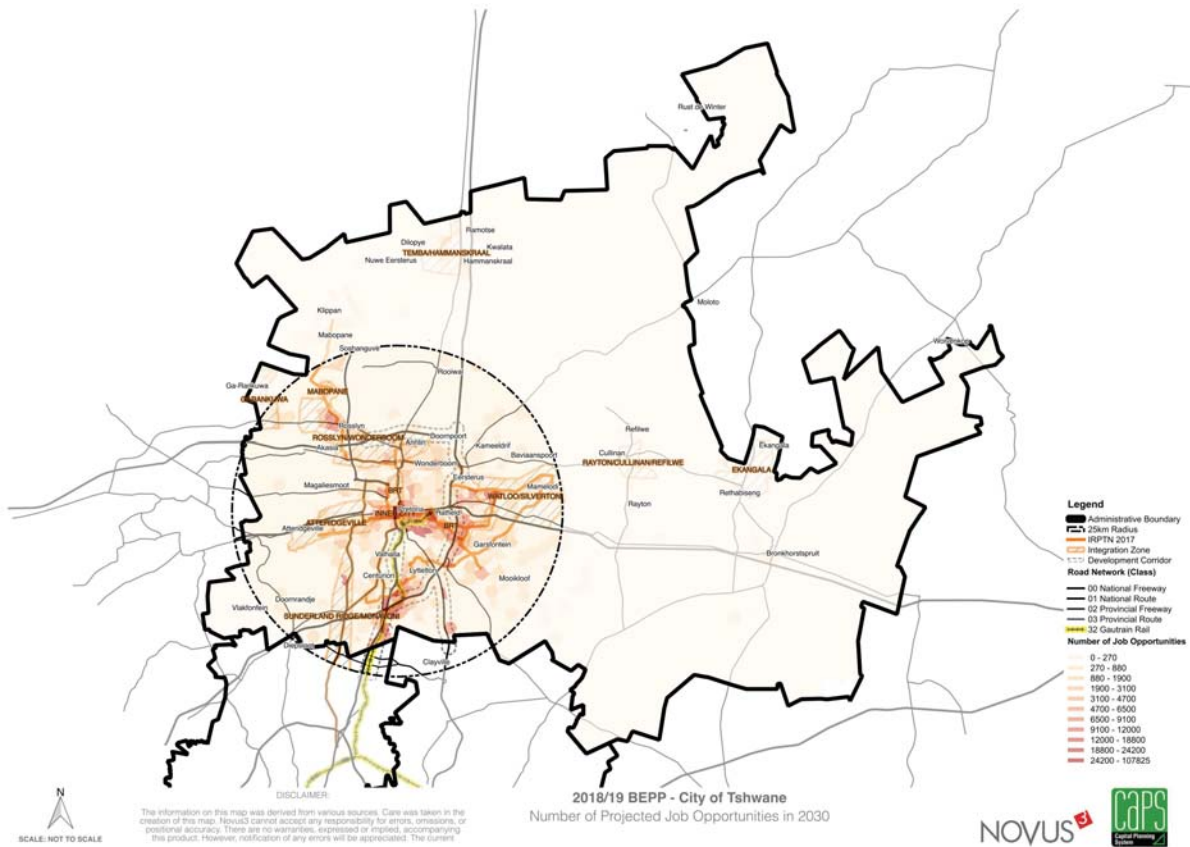


Figure B-22: Projected growth in employment opportunities per modified sub place, CSIR

The following nodes has the highest number of jobs:

- CBD
- Centurion
- Mamelodi
- Menlyn
- Soshanguve
- Akasia

The model run by the CSIR show a very high level of employment opportunities in the Inner City. This result is to be expected based on the UNS concept. The growth model is based on the successful implementation of the Tshwane Inner City Regeneration Strategy (TICRS) which is aimed at repositioning National Department headquarters within the Inner City and re-establishing the City of Excellence as the Capital of South Africa. Other than the CBD, significant nodes such as Menlyn Maine and Centurion also boast large number of job opportunities followed by Mamelodi, Soshanguve and Akasia.

It is important to keep in mind though that these projections are based on current infrastructure realities specifically in terms of transport. Any specific intervention that will create new capacity or new linkages may therefore result in a different projected outcome.

To better understand the projections made by the CSIR it is useful to investigate the nodes which will experience large growth rates in terms of employment opportunities. The growth rate will not only show where development pressure will be experienced in the next few years, but it will also show where the areas are that should link with the nodes identified through the expected household model. The figure below shows the growth rate of employment opportunities:

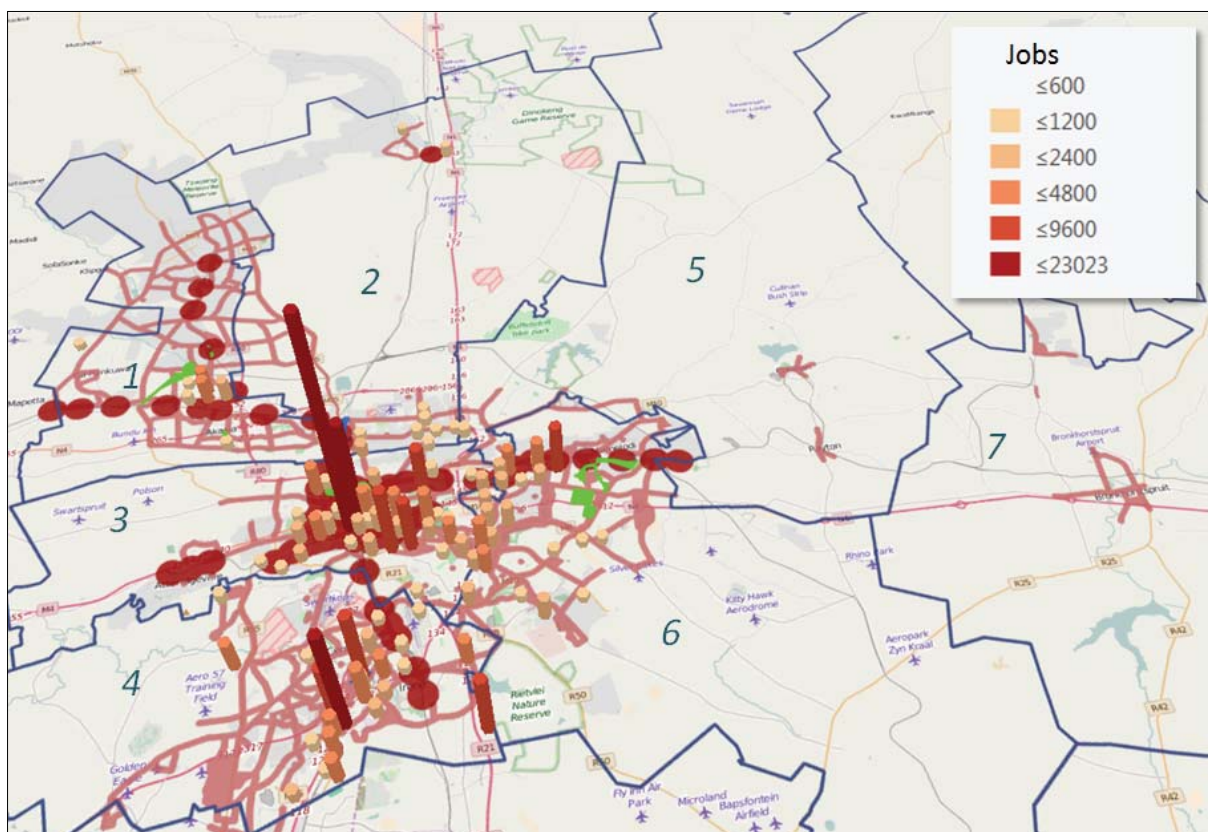


Figure B-23: Projected growth in employment opportunities per modified sub place between 2011 and 2030 CSIR

The following areas are areas with the highest growth rate of employment opportunities in the City of Tshwane according to the CSIR:

- CBD
- Centurion

- Mamelodi
- Menlyn
- Soshanguve

The area expected to experience the largest growth of employment opportunities is the Inner City of Tshwane (CBD) as a result of the Tshwane Inner City Regeneration Strategy. Other developments that will contribute to the realisation of this expected growth model is the development of Menlyn Maine and the development of Centurion CBD. Economic opportunity growth patterns tend to grow towards the south, where it links with other economic power houses in the province such as Midrand, Sandton and Johannesburg. Other areas that will have a significant growth in economic opportunities – but not nearly as to the degree of the Tshwane and Centurion CBD – is Mamelodi and Rosslyn. Growth to the north of the Magalies Mountain range is restricted by transport capacity that is currently incapable to deal with additional demand.

B.1.2.1.4 Household distribution versus economic opportunity distribution

The CSIR has identified areas where growth in household number and growth in economic opportunities can be expected for the next ten to twenty years. To create the ideal Urban Network Structure as defined by National Treasury, areas where high volumes of households are expected should be linked to areas where high volumes of employment opportunities are expected. The following figure evaluate the correlation between household distribution and economic opportunity distribution.

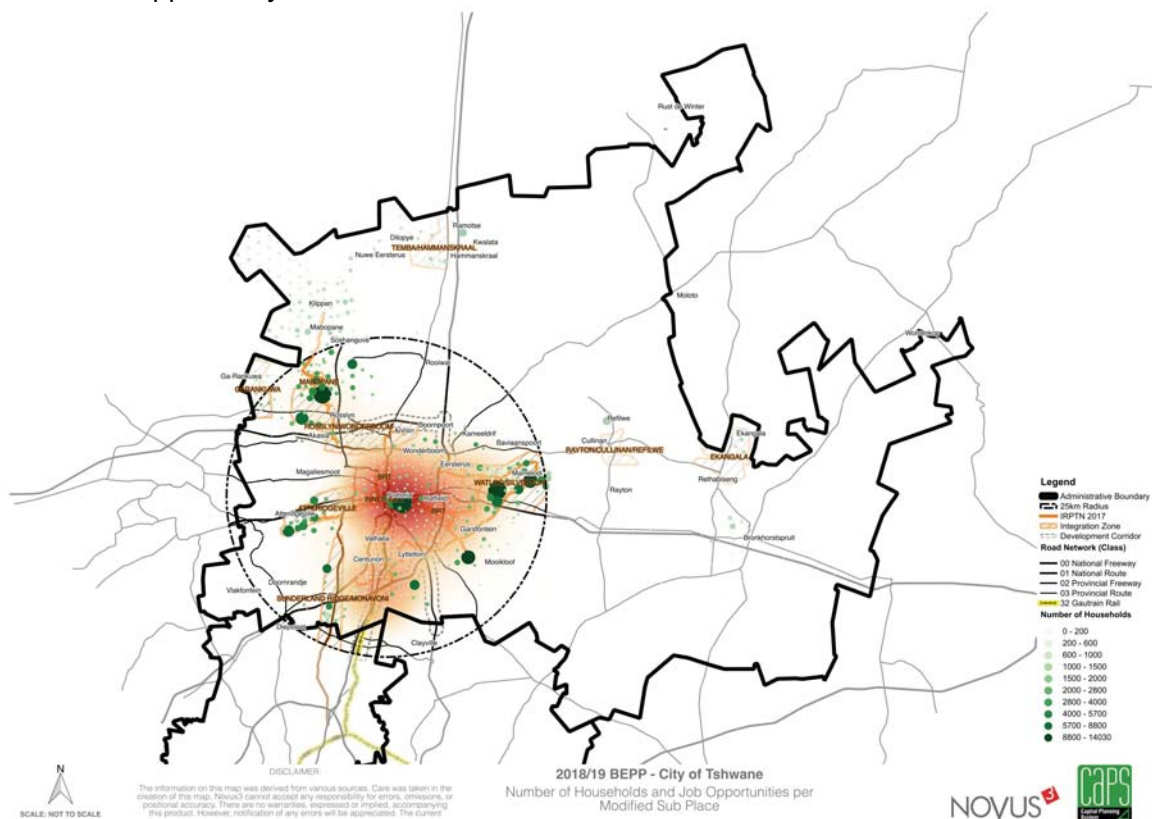


Figure B-24: Number of Households versus Job opportunities per modified sub place, CSIR



Figure B-25: Number of Job opportunities versus households per modified sub place, CSIR

The two figures above shows a clear spatial disjoint between places of living and places of working – typically representing a city facing urban sprawl with economic centres in the middle of the spatial configuration and high household volumes on the outskirts of the urban spatial structure. To overcome this disjoint between places of living and places of working, the City has started to implement the IRPTN.

The IRPTN of the City of Tshwane however links expected housing demand with economic opportunities but still fail to link the growing economy in the southern parts of the city.

B.1.2.2 Transport and movement pattern Analysis – the backbone of activity corridors

The City of Tshwane’s (CoT) Integrated Rapid Public Transport Network (IRPTN) refers to the rapid component of its overall Integrated Public Transport Network (ITPN). Whilst the ITPN covers all transport routes and modes (including rail, bus, minibus-taxis, metered taxis and non-motorised transport); the IRPTN covers the heavy rail (metro rail), rapid rail (Gautrain), Light Rail Transit (LRT), Bus Rapid Transit (BRT) and Quality Bus Services (QBS).

The City’s IRPTN Operational Plan was prepared in 2014 for a period of 25 years (taking it up to the year 2037). The purpose of the plan is to provide the City with a strategy pertaining to

the proposed future status of the rapid transit component of the City's integrated public transport network. Whilst the plan principally conveys detailed information on the routes identified as suitable for rapid transit, it also addresses aspects such as phasing of the routes, mode specification, station locations, types and sizes, operational parameters, guidelines for implementation, associated and supportive land-use planning and cost estimations.

For the purposes of this report, the focus will be on the identified routes, modes, stations and phasing contained within the IRPTN. It is important to note that since the preparation of the 2014 report, there have been some changes to the IRPTN route, in relation to the alignment of some of the A Re Yeng Tshwane Rapid Transit (TRT) routes, as well as the introduction of a Bus Rapid Transit (BRT) Light service on some of the planned TRT routes. Details on these changes can be found in the CoT 2016-2028 A Re Yeng Operational Plan of October 2016.

B.1.2.2.1 IRPTN: A Re Yeng Tshwane Rapid Transit

The City's Tshwane Rapid Transit (TRT) makes up a substantial portion of the total IRPTN. The modes of choice for the TRT is Bus Rapid Transit (BRT). Currently, two TRT trunk routes are operational namely:

- Between Pretoria CBD and Hatfield; and
- between Pretoria CBD and Rainbow Junction.

The City plans to have six TRT trunk lines operational by 2028, accompanied by complementary and feeder systems. See the figure below for the TRT operational roll out, and the following table for the TRT project phasing and "go live" dates, as per the 2016-2028 A Re Yeng Operational Plan.



Figure B-26: TRT Operational Roll Out

Table B-1: A Re Yeng TRT Project Phasing and Go Live Dates

| Infrastructure construction Phasing | Construction area description (from) | Construction area description (To) | BRT Line | Construction Start Date | Significant Construction Completion Date | “Go Live” date |
|-------------------------------------|--------------------------------------|-------------------------------------|-------------|-------------------------|--|----------------|
| Phase 1A | CBD | Hatfield | BRT Line 2A | January 2013 | Completed | Q4 2014 |
| Phase 1B | Mayville | Hatfield via CBD | BRT Line 1A | April 2013 | Completed | Q2 2016/17 |
| Phase 1C | Wonderboom | Mayville | BRT Line 1A | September 2014 | Completed | Q2 2016/17 |
| Phase 1D | Hatfield | Menlyn | BRT Line 2B | November 2016 | October 2018 | Q3 2018/19 |
| Phase 1E | Menlyn | Denneboom Station | BRT Line 2C | November 2016 | May 2018 | Q3 2018/19 |
| Phase 1F | Rainbow Junction | Akasia | BRT line 1B | June 2018 | August 2019 | Q2 2019/20 |
| Phase 1G | Rainbow Junction | Akasia | BRT Line 1C | June 2018 | August 2019 | Q2 2019/20 |
| Phase 1H | CBD | Atteridgeville | BRT Line 3 | October 2018 | March 2020 | Q24 2019/20 |
| Phase 1I | Denneboom | Mahube Valley | BRT Line 2 | November 2019 | April 2021 | Q2 2020/21 |
| Phase 1A (of Phase 2 network) | Deneboom | Rainbow Junction | BRT Line 4 | July 2021 | June 2023 | Q2 (2023/24) |
| Phase 2A (of Phase 2 Network) | Mahube Valley | Garsfontein | BRT Line 5A | July 2023 | December 2024 | Q4 (2024/25) |
| Phase 2B (of phase 2 Network) | Menlyn (Atterbury Road) | Garsfontein (Solomon Mahlangu Road) | BRT Line 11 | October 2024 | June 2025 | Q1 (2025/26) |
| Phase 2C (of Phase 2 Network) | Garsfontein (Solomon Mahlangu) | Centurion CBD | BRT Line 5B | April 2025 | December 2026 | Q4 (2026/27) |
| Phase 3 (of Phase 2 Network) | Pretoria CBD | Olivenhoutbosch | BRT Line 6 | January 2027 | June 2028 | Q2 (2028/29) |

As mentioned previously in this chapter, the IRPTN network, in particular along the TRT network sections, have undergone some planning changes since the IRPTN study of 2014. The changes in the proposed TRT route alignment are as follows:

- Line 3 in the Atteridgeville area is shortened and ends in the centre of Atteridgeville.
- Two complementary routes are introduced between Rainbow Junction and the Pretoria CBD, one each along Steve Biko Road and Es'kia Mphahlele Drive. This is intended to provide additional capacity to the north-south movement that the trunk route along Paul Kruger Road services.

A further change to the TRT system is the proposal of a BRT Light system along some of the previously proposed TRT trunk routes. This was done in response to low ridership and the high financial and time-related costs of implementing and operating a full BRT trunk service along those particular routes. Although not yet approved as a strategy, the BRT Light is proposed as a lower specification service, with the main BRT Light features being:

- The service will not have right of way (BRT trunk service has right of way); this reduces the capacity of the service by approximately half;
- The service will operate mainly in mixed traffic with dedicated bus lanes on small portion of the route (BRT trunk service operates on a dedicated lane);
- The service stations will be of a lower order, without doors, and located on the left-hand kerb of the road (BRT truck service stations are higher order and located in the median); and
- The service will be fed complementary services run by the TRT, with feeder services possibly being provided by the minibus taxi industry (BRT trunk services have both complementary and feeder services operated by the TRT).

To realise the ideology of the Urban Network Structure as a remedy for the dispersed, underserved, deprived residue of the inherited Urban Network Structure and to unlock economic opportunities, the City must stimulate development along Activity Corridors i.e. the Integration Zones. However, the City is constrained financially and should prioritise investment in the Activity Corridors.

The following figure shows the total planned IRPTN network as described in the table above which in the long term should inform the identification and formulation of the Activity Corridors. The activity Corridors in return should act as a prioritisation mechanism, elevating projects within these areas to a higher priority for financial investment.



Figure B-27: City of Tshwane Potential Activity Corridors

Table B-2: Categorization of Potential Activity Corridor

| BRT Line | Integration Zone | Infrastructure construction Phasing |
|---------------------|-------------------------------|-------------------------------------|
| Activity Corridor 1 | Line 2A Line 1A | Phase 1A Phase 1B Phase 1C |
| Activity Corridor 2 | Line 2B Line 2C Line 2D | Phase 1D Phase 1E Phase 1I |
| Activity Corridor 3 | Line 1B Line 1C | Phase 1F Phase 1G |
| Activity Corridor 4 | Line 3 | Phase 1H |
| Activity Corridor 5 | Line 4 | Phase 2.1 |
| Activity Corridor 6 | Line 5a Line 11 | Phase 2A Phase 2B |
| Activity Corridor 7 | Line 5B | Phase 2C |
| Activity Corridor 8 | Line 6 | Phase 3 |

Activity Corridor 1 is located along BRT line 2A and line 1A which runs from Pretoria Central to Hatfield, and Hatfield to Mayville via Pretoria Central respectively. It links The Metropolitan Node of Hatfield with The Urban Core (CBD) and Capital Park after which it extends to the north up to Rainbow Junction. Considering various factors such as expenditure to date, assets under construction, spatial targeting and densification it only makes sense from a financial sustainability point of view as well as a spatial targeting and development sustainability point of view, that Line 2A and Line 1A should function as the Activity Corridor as per the Urban Network Structure Ideology described earlier in this section.⁶ The other potential integration zones are still dependant on the roll-out plan of the IRPTN and will not be regarded as Activity Corridor's until further notice.

B.1.2.2.2 Heavy Rail (Metro Rail)

The Metro Rail service is owned and operated by Passenger Rail Agency South Africa (PRASA). The CoT and PRASA agreed on the principle that rail would form the backbone of the IRPTN; any future network planning would be based on this principle. It is important to bear in mind that the focus of PRASA's services are planned on dedicated, right-of-way, rail-based commuter services between major nodes. See the figure below.



Figure B-28: Existing and planned PRASA rail

⁶ A Activity Corridor, as described by the Urban Network Structure ideology of National Treasury is areas along rapid public transport which connect the urban hubs and the CBD, where high-density land development is to be promoted.

Currently, the PRASA rail network links the Pretoria CBD (with its work and education opportunities) with the northern, southern, western and central areas of Tshwane (which are more residential in nature). There are limited links to the eastern areas, such as Bronkhorstspuit, Kameelfontein and Cullinan.

The planned extensions to the network will provide the following links:

| Link Number | From | To |
|-------------|-----------------|--|
| 1 | Soshunguve | Hammanskraal |
| 2 | Bronkhorstspuit | Pretoria CBD |
| 3 | Pretoria CBD | Kameelfontein and Moloto (in Mpumalanga) |

Here follows a comparison of the existing and planned PRASA rail network with the projected number of households and work opportunities in 2030, as modelled by the CSIR.

It can be seen from the figure below that the following projected residential areas will not have access to the PRASA metro rail service (existing or planned):

- The far northern areas of Tshwane (Bosplaas, Babelegi, Dilopye, Haakdoornboom);
- The far north-west area of Tshwane (Winterveldt, Tsebe, Makanyaneng);
- The area immediately north of the CBD (Montana, Sinoville, Doornpoort, Wonderboom)
- The area to the west of Atteridgeville
- The south-west area of Tshwane (Olivenhoutbosch)
- The area south-east of the CBD (Kongwini, Rietfonteing, Mooikloof, Zwavelpoort)
- Areas in the east of Tshwane (Refilwe, Ekangala, Rethabiseng)

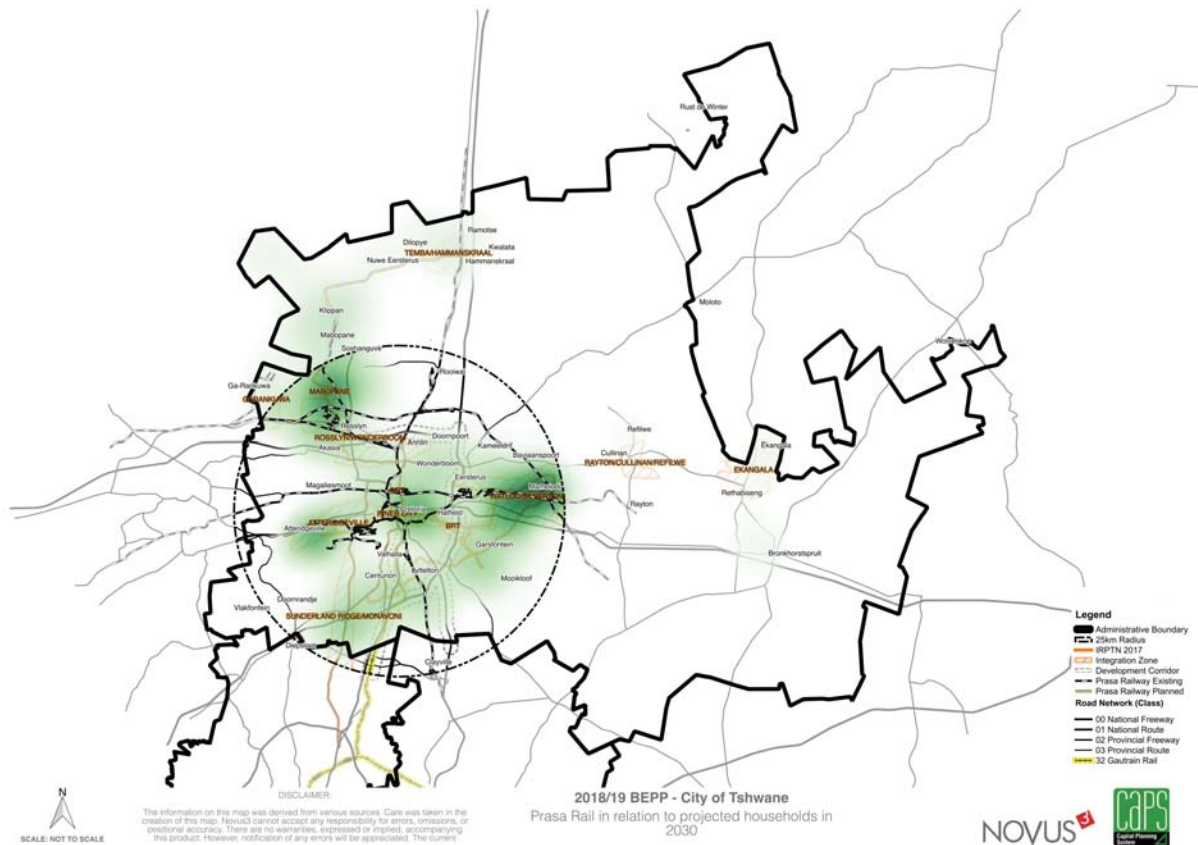


Figure B-29: PRASA rail in relation to projected households in 2030

From the findings above, it is important to make the correlation that most of these areas (except for the Montana, Doornpoort, Sinoville and Wonderboom areas) are expected to house mainly residents from the lower income brackets. Since these residents are precisely the users who require access to an affordable mode of public transport, such as the Metro Rail, the connectivity of these areas to the Metro Rail service should be a priority for the City., as per the IRPTN, PRASA and the CoT have an agreement that the City will provide services that feed the rail service – it is strongly recommended that the City provides and prioritise feeder services to the rail system in the areas mentioned above.

It can be seen from the figure below that the following projected employment areas will have not have access to the PRASA metro rail service:

- The area immediately north of the CBD (Montana, Sinoville, Doornpoort, Wonderboom)
- The south-west area of Tshwane (Olivenhoutbosch)
- The area south-east of the CBD (Waterkloof, Moreleta Park, Rietfontein, Mooikloof)

The Olivenhoutbosch area (south-west of Tshwane) was also shown to have a lack of connectivity to the rail network in the residential areas assessment above – this finding strengthens the recommendation that the City prioritise implementing feeder services from this area to the rail service.

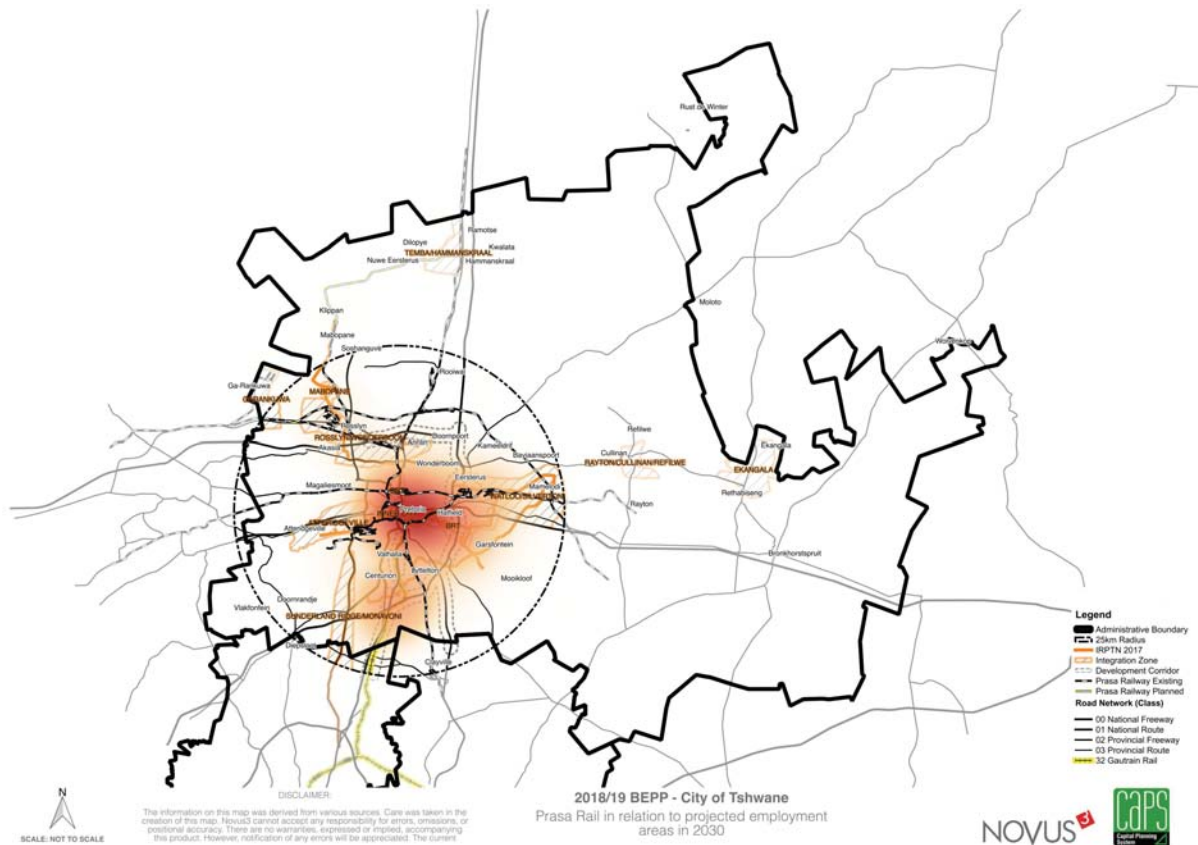


Figure B-30: PRASA rail in relation to projected employment areas in 2030

The Gauteng City-Region Integrated Infrastructure Master Plan 2030, states that PRASA is set to upgrade 19 stations, commission new urban felt and construct new railway lines; however, from the above figure, it can be deduced that a relatively small number of PRASA developments is taking place on the urban edge.

B.1.2.2.3 Gautrain Rapid Rail

The Gautrain Rapid Rail service has been operational since 2010, and links Hatfield to the Johannesburg CBD and OR Tambo International Airport via Pretoria CBD and Centurion. There is future planning in place to extend the network to link to Mamelodi and Pretoria East, and in Johannesburg to link to Fourways, Randburg, Roodepoort and Soweto.

The Gautrain also provides a bus feeder system at each of its stations. Whilst the Gautrain service does provide some connectivity between areas of high projected residential demand and projected employment opportunities, it is important to note that this service caters to a specific market segment. It is a relatively expensive service to use and therefore do not consider the immediate distribution of its services to all areas in the City – areas which might later become a priority.

The figure below shows the existing and planned Gautrain network in relation to the projected households in 2030. The network provides little connectivity to the high density residential areas as circled in red; however, it is unlikely that the predominantly low-income residents in these areas would use the Gautrain as it is cost-prohibitive. Some middle to upper income

earners in the medium to high density residential areas of Pretoria East, Centurion and Olivenhoutbosch (circled in blue) will likely make use of the planned Gautrain service.

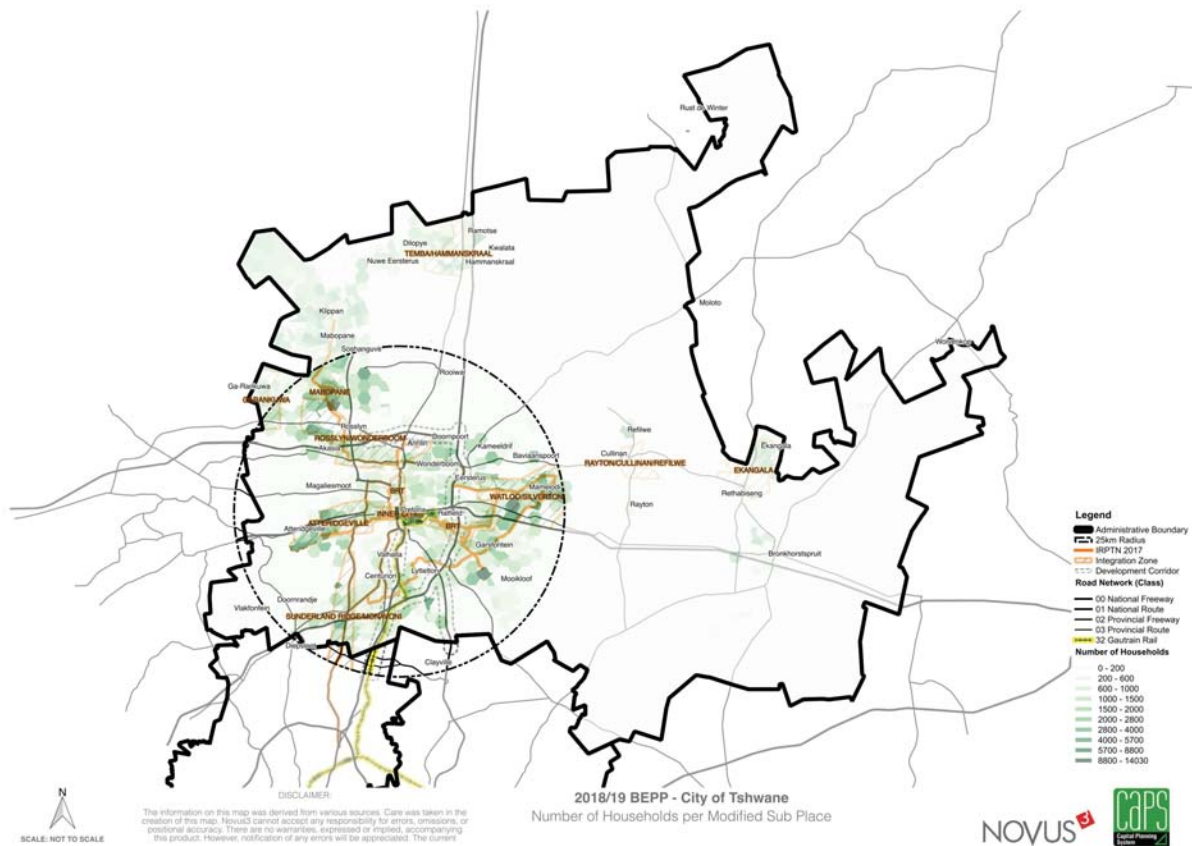


Figure B-31: Existing and Planned Gautrain network in relation to projected households in 2030

The figure below shows the reach of the existing and planned Gautrain network in relation to projected jobs in the 2030 scenario. The employment areas of Pretoria CBD, Hatfield and Centurion (circled in green) are currently serviced by the Gautrain network. The employment area around Silverton (circled in blue) will benefit from future Gautrain connectivity; it is important to stress again that the Gautrain service is cost-prohibitive and so inaccessible to lower income earners – the Silverton area is one of predominantly industrial use and so it can be assumed that the majority of employees in this area will be lower income earners.



Figure B-32: Existing and Planned Gautrain network in relation to project jobs in 2030

B.1.2.2.4 Origin-Destination Information

Origin-destination data is also known as flow data and shows the flows of people from one place to another. Origin-destination data is a specialised data input to transport modelling and planning. Given that an origin-destination analysis is a cumbersome and in-depth detailed analysis and that the scope of this document is not to undertake an origin-destination analysis, this section will only consider the two most basic components of an Origin-destination data set namely the points of origin of trips in the city versus the points of destinations in the city.⁷

B.1.2.2.5 Points of Origin

From the figure below, it is clear that most trips originates in areas such as Mamelodi, Centurion and Shosanguve. Other significant points of origin includes the inner City, Pretoria east, Atteridgeville and Akasia/Wonderboom. This metric gives an indication as to where the population resides and where trips originates.

⁷ It is important to note that no direct correlation should be drawn between the two data sets as this data type should be viewed in pairs in order to determine routes. This analysis simply shows where the population resides as certain times of day.

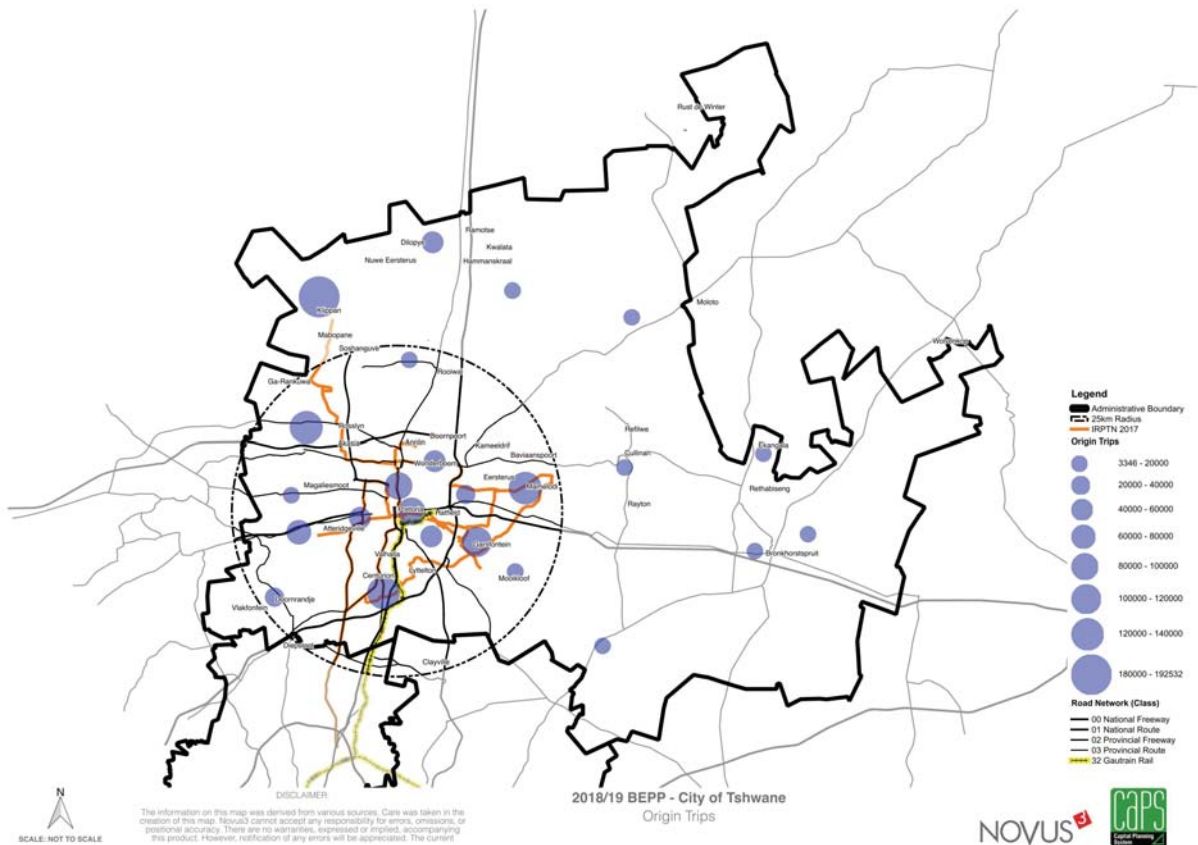


Figure B-33: Points of trip origins and destinations in the City of Tshwane



Figure B-34: Points of trip destinations in the City of Tshwane

B.1.2.2.6 Origin-Destination guidelines

From the figure below, one can see the most common origin-destination pairs. The thicker the lines, the more trips between the start and end point of those lines. Typical lines include links between:

- Akasia and Wonderboom
- Atteridgeville and Lotus Garden
- Centurion and Olivenhoutbosch
- Garankua and Shohanguve
- Garsfontein and Moraleta
- Mabopane and Inner City
- Mamelodi and Hatfield

These lines informed the placement of the IRPTN and should encourage not only public transport but also capital expenditure as well as private investment within the City.



Figure B-35: Origin Destinations guidelines in the City of Tshwane

B.1.2.3 Population distribution and Housing Analysis – identification of underserved areas

In view of national, provincial and even local space economy policies, it is imperative that we ensure an investment correlation between physical economic infrastructure and targeted economic hubs, to ensure that the broadest possible opportunities for job creation and that the city's economic growth are ensured.

The BEPP assumes the position taken by the Urban Simulation undertaken by the CSIR in that if the investments are misaligned with accurate development futures, whether due to the below mentioned reasons, these investments may become superfluous white-elephants, even ghost cities, left to haunt the financial reserves of the City and detracting from the funding required to pursue impactful initiatives that will decisively reduce socio-economic inequality in the City.

- Over- or under-estimation of population growth;
- lack of understanding of demographic profiles (e.g. income groupings of the future);
- misinterpretation of area-based population growth;
- assumptions around which sectors of the economy will grow and where; and
- unmet expectations of the available workforce to meet the demands of the economy that is being pursued or even disproportionately low levels of private sector investment in public-driven initiatives.

B.1.2.3.1 City of Tshwane Human Settlements Plan

Since 1994 South Africa has embarked on several programmes towards building a better life for all by providing, amongst others, shelter and basic services for the poorest of communities in the country. As part of the system of developmental local government, and in terms of the Municipal Systems Act, municipalities are required to develop Integrated Development Plans (IDPs) that are to serve as the basis for service delivery. According to the Housing Act, 1997 section 9(1)(f), every municipality must, as part of the municipality's process of integrated development planning, take all reasonable and necessary steps within the framework of national and provincial housing legislation and policy to initiate, plan, coordinate, facilitate, promote and enable appropriate housing development in its area of jurisdiction.

The primary objective of the Sustainable Human Settlement Plan is to assist the City in achieving the very important "step 1" of providing a sound strategic context to the issue of housing supply and demand, before getting to the specific objectives pertaining to the provision of turnkey solutions for rental housing, integrated mixed housing typology solutions, eradication of informal settlements/back yard shacks, etc. Objectives of the Sustainable Human Settlements Plan (SHSP) are summarised in the table below:

Table B-3: City of Tshwane Sustainable Human Settlements Plan 2014 - Objectives

| SHSP Objectives | SHSP Outcomes | Points of Departure |
|--|---|---|
| To develop a comprehensive housing development and delivery plan for municipalities in Gauteng Department of Human Settlement providing strategic direction and guidance to the municipalities as to key housing delivery priorities and focus in terms of housing delivery in the Province. | To develop a single shared vision and housing delivery plan between various spheres of government role-players and stakeholders for the local municipality. | Provide strategic direction and guidance in terms of a single human settlement delivery plan for the local municipality. |
| To integrate the SHSP's into the Municipal Integrated Development Plans, and ensure that the SHSP becomes the housing component of the IDP. | Ensure integration of the Housing Delivery process with Provincial Departments and Local Authority initiatives. Ensure an understanding of and address the constraints within which Housing Delivery takes place at a Municipal Level. Supplement the IDP sector plans. | Provide for a single shared housing vision for the City of Tshwane. Ensure political and policy alignment. Establish a common understanding of housing delivery challenges and constraints. |
| To ensure that the SHSP's provide a consistent tool to evaluate proposals and applications at both a provincial and municipal level, through the development of a GIS based support system. | Provide a user friendly and accessible tool to all authorised users to manage and monitor housing delivery in the local municipality. | Explore and recommend tools to monitor and evaluate housing delivery on a Provincial and Municipal scale. |
| To establish a framework for housing delivery in terms of the National Housing Program and Gauteng Department of Human Settlement (GDHS) Strategic direction. | Ensure policy alignment at a National, Provincial and a Local level. | Ensure sustainable and spatially integrated housing delivery. |
| To provide both GDHS and municipalities with a tool to strategically locate future housing settlements, taking into consideration the constraints and opportunities that exist at a municipal level. | Ensure the establishment of sustainable housing developments and spatial integration and adherence to SPLUMA Principles. | Ensure relevance and effectiveness of housing delivery programs and products. |
| To identify key issues to be addressed. | Lessons Learnt and best practices regarding housing delivery in the Province. Assess effectiveness of Departmental programs and products delivery. | Provide a framework for incorporation of the SHSP's into the IDP Reviews in the form of an IDP Housing Chapter. |

The City of Tshwane produced Sustainable Human Settlement Plan for its area of jurisdiction, not only to comply with the requirements of the Department of Housing Human Settlements, but also to ensure that the City of Tshwane meets their constitutional obligation of ensuring that their residents have proper access to sustainable housing solutions. The point of departure of the Sustainable Human Settlements Plan can be summarized as follow:

- To ensure effective allocation of limited resources, financial and human, to a wide variety of potential development initiatives;
- To provide guidance in prioritising housing projects in the Tshwane area to obtain consensus for the timing and order of their implementation;
- To ensure more integrated development through coordinating cross-sector role players to aligning their development interventions in one plan;
- To ensure budget allocations to the City of Tshwane are most effectively applied for maximum impact;
- To provide effective linkages between the City of Tshwane Spatial Development Framework and the location of housing projects which include a range of social, economic, environmental and infrastructure investments;
- To ensure there is a definite housing focus in the IDP and SDF with clear direction for future housing delivery across all social and economic categories and locations in the municipality;
- To provide the City of Tshwane IDP and Budgeting process with adequate information about the housing plan, its choices, priorities, parameters as well as strategic and operational requirements;
- To ensure that the contents and process requirements of planning for housing are adequately catered for in the IDP process; and
- To ensure that there is indicative subsidy budgeting and cash flow planning at both the municipal and provincial levels.

Housing demand focuses on quantifying demand in terms of the number of units required, and more specifically, the type of demand i.e. full ownership or rental units, as well as demand for subsidised units versus bonded housing. The Locational implication of this demand is also an important factor to consider when evaluating and considering housing demand. The City has identified, by means of the Sustainable Human Settlements Plan 2014, the current demand of underserved townships. The plan differentiated between the following categories:

- In – Situ Upgrading
- Formalised
- Existing Townships
- Receiving Area



Figure B-36: Underserved Township categories, Sustainable Human Settlements Plan 2014

The spatial distribution of the underserved townships is clearly on the periphery of the city. Any development that does not stimulate economic activity within these areas, primarily Mamelodi, Atteridgeville, Olievenhoutsbosch and Soshanguve up to Temba, will reinforce the spatial inequality of the City and would demand fruitless spending by the City. On the other hand, development that enables linkages between these areas and economic opportunities, will stimulate the economy of the said areas, reducing inequality and will address spatial and economic reform in the City. This in turn will align with the City's endeavours to realign, revitalize and re-industrialise and so will unlock favourable spending by the City which will ensure the long-term sustainability of not only the human settlements but also the spatial municipality that is Tshwane.

Institutional resources include both government and the private sector. Government is responsible for the formulation of human settlement related legislation and policies, and it provides in the need for subsidised housing via a range of subsidy/housing programmes with human resources to oversee the implementation of these projects. The table below indicates the estimated housing backlog within the City.⁸

⁸ Provided by the City of Tshwane Department of Human Settlements

Table B-4: Housing Demand

| DEMAND | UNITS/STRUCTURES |
|---|---------------------------------|
| Informal Housing Counts | 155 948 households (2013 stats) |
| Backyard Units | 83 378 (2013 stats) |
| Demand Database/ Housing Needs Register | 166 832 (2017 stats) |

There is an estimated 155 948⁹ informal structures in the City of Tshwane. These informal structures exist in a total of 178 incidences/clusters of informal settlements. Since the 2013 counts, fourteen more informal settlements have been identified. Not all these units are “shacks” as many of the houses located in areas under traditional authorities are permanent in nature. Backyard units were approximately 83 378 in 2013 and it can be assumed that the majority of these represent rental demand, and more specifically affordable rental. The Demand Database as per the National Housing Need Register changes on a regular basis as and when people register on the needs register and/or qualifying beneficiaries are approved and allocated houses.

Having determined the size, location and nature of demand, it is then necessary to determine and assess the physical resources available at the respective areas of demand. Physical resources entail the assessment of availability of well-located and environmentally suitable land, and whether the land is public or privately owned. Well-located land is normally close to economic activity/job opportunities, infrastructure in the form of bulk engineering services (water, sanitation, electricity, roads and stormwater) is readily available, while access to social services and facilities (health, education, welfare, safety and security and sports and recreation) is also of critical importance in pursuance of sustainable development.

Rural and marginalized settlements have experienced continuous population growth in areas where access to land is possible and transport services are good. Population densities in these places are approaching those of urban areas, but the economic base and the infrastructure to manage the said areas are still undesirable. The City is in the process of developing the Rural Settlement Strategy aimed at retaining the existing rural/ agricultural areas. Research will also be conducted to investigate implementation of different subsidies when settlements located in these areas are implemented.¹⁰

Agri Village establishment is a relatively new Human Settlements concept in the policy environment which has a focus on self-sustaining living. The focus on the establishment of specialised centres in the form of Agri-Villages in appropriate locations will specifically help to facilitate agrarian transformation and land reform as envisioned by the Comprehensive Rural Development Programme (CRDP). The key to the success of Agri-Village development is rooted in the principle of focused and deliberate government investment spending to ensure

⁹ 2013 Survey

¹⁰ Refer to Section E of the 2018/2019 BEPP

that these centres develop to provide an extensive range of community facilities and becoming the spatial focal points of agriculturally driven LED interventions and land reform initiatives. By doing so, an Agri-Village possess the inherent potential to act as a potential secondary around which the critical mass required to initiate formal and informal local economic development can develop over time.

B.1.2.4 Development Trends

The City has conducted a development trend analysis in order to identify whether the City is actually encouraging development in the desired spatially targeted areas. The Trends analysis deals specifically with trends in the built environment from July 2012¹¹ up until July 2015.

The aim of the development trends analysis was to act as an indicator towards how successful the spatial planning in the City is. Further it would give an indication of problematic areas in terms of trends that do not align to the desired spatial patterns as foreseen by the City.

The information used for the trends analysis includes:

- Information as provided to Stats SA on a monthly basis regarding buildings completed was used for the built environment section of the report.
- The City's township and application database was used to determine future trends. Only applications submitted or approved between July 2012 and June 2015 were used to determine future trends.
- Interviews with developers and private town planners.
- Site inspections were done along corridors and at nodes.

It is important to indicate that only major development trends were investigated in this report. Major developments were regarded as retail development of more than 5000 m², offices of more than 1000 m², commercial / industrial development of more than 1000 m², higher density housing of more than 60 units per hectare and low density housing of more than 100 units. Lower density developments such as second dwelling use applications and subdivision applications did not form part of this study.

The figure below indicates the trends of housing development in the City by the Private Sector. The densification, by the densification overlay zoning within a 500m buffer zone around the TRT corridors, enables private development investments – a policy mechanism which enjoys much utilisation by the private sector based on the figure below.

¹¹ July 2012 was used as the base year due to the fact that large areas were incorporated into the City in 2012.



Figure B-37: Private Sector Housing Developments

B.1.2.4.1 Building and land use applications

The City received a total of 21 235 building plans in the Financial year 2014/2015. This is a 5% growth on the previous year when 20140 plans were received during the 2013/2014 year. Between 2012/2013 and 2013/2014, there was 3 % growth. Between 2011/2012 and 2012/2013 there was 20 % growth which can be contributed to the inclusion of the new areas (Metsweding) into the City during 2012.

Table B-5: Building Applications with the City of Tshwane: 2009 - 2015

| Financial Year | Number of Applications |
|----------------|------------------------|
| 2009 / 2010 | 10 269 |
| 2010 / 2011 | 13 495 |
| 2011 / 2012 | 16 310 |
| 2012 / 2013 | 19 529 |
| 2013 / 2014 | 20 140 |
| 2014 / 2015 | 21 235 |

Applications received are defined as Township establishment, Rezoning, Consent use, Permission, Removal of restrictive conditions, Division and Subdivision applications. The number of applications received per year was around 1400 per year between 2009 and 2012. The number then escalated to about 1700 and to 1900 for the next two fiscal years. The additional increase in numbers after 2012 is due to the inclusion of the Metsweding areas during 2012. It is expected that the number of applications received per year will remain at

the 2 000 level over the short term. Regions 4 and 6 are expected to remain the most active regions in terms of applications received.

B.1.2.4.2 Buildings completed

The table below indicates the number of buildings completed in terms of the last six years. The number of buildings constructed were constantly about 6 000 until 2012. After the inclusion of the Metsweding area, the figure grew to about 9000 buildings per year.

Table B-6: Building Applications with the City of Tshwane: 2009 - 2015

| Financial Year | Number of Applications |
|----------------|------------------------|
| 2009 / 2010 | 5 764 |
| 2010 / 2011 | 5 835 |
| 2011 / 2012 | 6 977 |
| 2012 / 2013 | 8 234 |
| 2013 / 2014 | 8 750 |
| 2014 / 2015 | 8 626 |

B.1.2.4.3 Development trends interpretation

From the development trends analysis, the following deductions can be substantiated:

- The development in the City of Tshwane between 2012 and 2015 was the highest in Gauteng as reported to Stats SA;
- The majority of the development was in line with the spatial planning of the City and was in the nodes and corridors;
- The BRT corridors were specifically active in terms of line 2 A and line 2 B. The development corridor around the N1 also received a large number of development with the focus on office developments;
- A relatively small number of development took place on the urban edge far away from public transport, but this is due to latent rights that were approved before the approval of the MSDF and RSDF in 2012;
- The applications received between 2012 and 2015 indicated a strong trend in terms of proposed developments in the nodes and corridors;
- The residential densification applications are also near existing or planned public transport facilities;
- Line 2 B received the bulk of the applications and this trend is expected to continue. The applications for office and commercial developments were mostly in nodes or corridors. The application trends area also indicates a preference for the N1 development corridor; and
- The application trends indicate that development in the short term will take place in line with the spatial planning of the city and province.

Considering the above mentioned, the dominant reality however is that the city has highly dispersed, mono-functional land use structure that affect not only public service and spatial planning but also the City's residents. Residence of Tshwane need to travel long distances to and from places of work, which turns into higher travel costs and less time and money to spend on other social, investment or recreational aspects that result in more rewarded lifestyles. Yet

many of the poorest people live in the most peripheral locations of the city and are most disadvantaged by the long travelling distances and the fact that other developments do not occur in close proximity.

Focused investment of densification¹² on IRPTN corridors by the City, more specifically the Housing and Human Settlements department, should be investigated further to ensure Social Equality and better lifestyle quality for all within the borders of the municipality.

B.1.3 Identification of Urban Network Structure

The previous parts of this section have depicted the spatial reality of the City of Tshwane. In order to report in terms of the Urban Network Structure ideology of National Treasury, this part of this section will discuss the interplay between the various elements – specifically regarding the alignment between Public Transport and Human Settlements – and will be followed by a synthesis of the analysis run which will lead to the identification of the Urban Network Structure of the City of Tshwane.

The National Development Plan 2030 states that shifting settlement patterns should be investigated to align public investment in infrastructure and services with these trends, and to develop appropriate systems of land tenure and growth management. It continues to mention that special attention must be given to areas of densification along transport corridors within previous homelands.

B.1.3.1 IRPTN versus Projected Population

The future planning process of IRPTN considered several factors using information available at the time. However, since then new studies have been completed which may have some impact on the IRPTN plan. These include the CoT's Sustainable Human Settlement Plan, completed in late 2014, and the Urban Simulation in support of the CoT's Vision 2030, undertaken by the CSIR and made available in August 2016.

This chapter will present the latest Sustainable Human Settlement Plan and the CSIR's Urban Simulation findings, in relation to the latest available IRPTN, with a view of determining how the IRPTN will connect the future residential areas with job opportunities in the City. It will also highlight any gaps in this connectivity, with recommendations on where additional future transport links should be provided.

In the figure below the existing and planned BRT network covers the projected residential areas substantially, except for the following locations:

- The far north-western area of Tshwane (Winterveldt);
- The far south-western area of Tshwane (Atteridgeville West); and
- Refilwe

The following is recommended:

- That a feeder service be planned to service the Winterveldt area which is projected to have a significant residential population in the future;

¹² Specifically, incentivized investment.

- That the TRT trunk route to Atteridgeville (Line 3) which was recently shortened, be reassessed to include services to the far west of Atteridgeville.
- That the complementary route between Pretoria, Cullinan and Bronkhorstspuit be reassessed to consider a route realignment into Refilwe.

Further, the significant projected residential density in the entire north-western Tshwane area (from Hammanskraal to Winterveldt, Soshunguve and Mabopane) will require a mass transit system to provide sufficient transport for the area. The planned BRT complementary routes are unlikely to suffice. It is recommended that, along with the extension of the PRASA Metro Rail line between Soshunguve and Hammanskraal, consideration be given to extending the Atteridgeville BRT trunk route northwards.

Additionally, the Olivenhoutbosch (in the south-west of Tshwane) benefits from future coverage of the BRT network – this part of the network should be given a higher order of priority¹³ to transport residents and employees alike between the area and the PRASA Metro Rail or the Pretoria CBD.

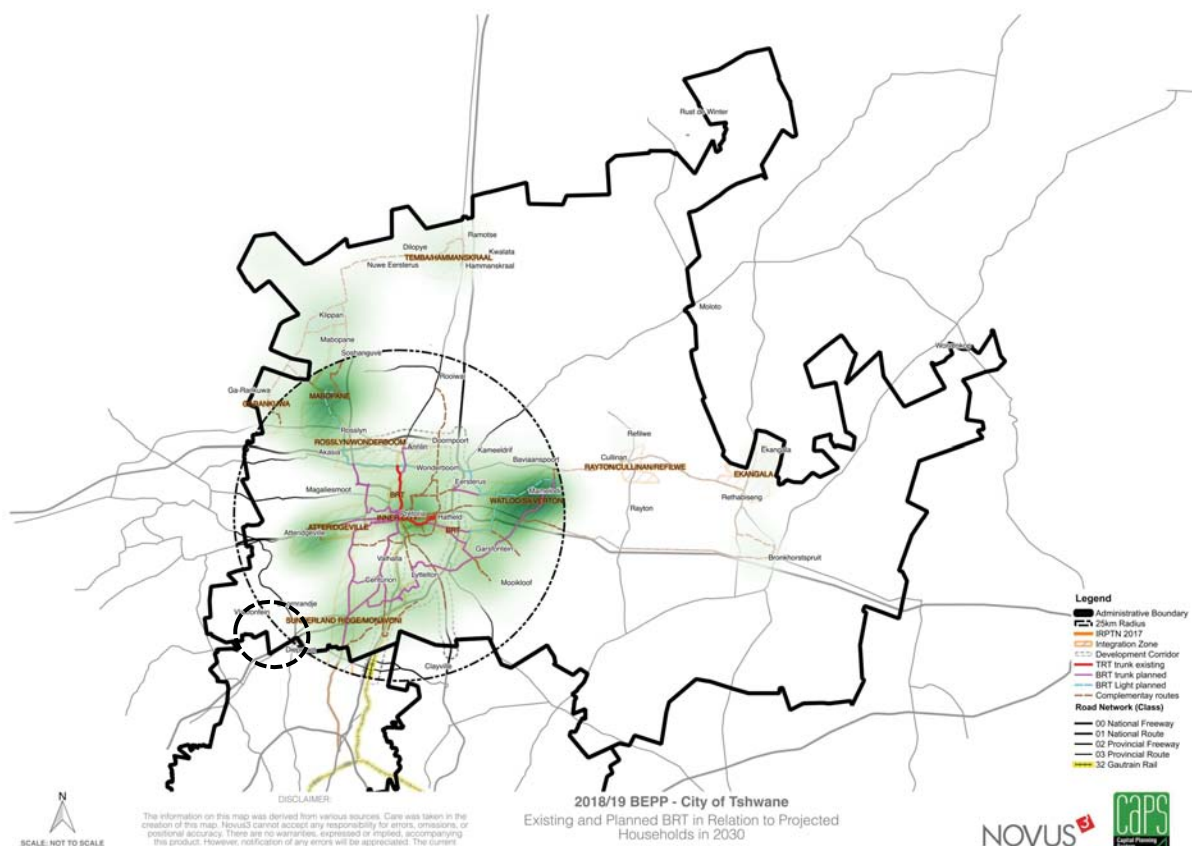


Figure B-38: Existing and Planned BRT in relation to project households in 2030

¹³ Please see the second part of this section for an elaborate discussion regarding the City's Prioritization methodology.

B.1.3.2 Alignment of Public Transport and Human Settlements

¹⁴Essentially, there are about 2 482 hectares of land suitable for residential development within the functional area of the Tshwane IRPTN. This land holds potential for 198 577 residential units at an average density of 80 units per hectare. The capacity around railway stations amounts to 65 048 units and along the BRT routes it stands at 133 529 units. Based on the nature and character of surrounding areas which the network runs through, the development potential is estimated at 77 330 (39%) low income (subsidised rental full ownership) units, 57 357 (29%) middle income units and 63 890 (32%) high income units.

The nature of development varies between redevelopment (in old areas), densification (subdivision etc.), and infill development (on green fields sites), and the typical housing typologies to be developed comprise 2, 3 and 4 storey walk-up facilities.

The table below shows the development potential per region and per income category. From this it is evident that the highest potential for low income development around the IRPTN is in Region 1 (36%), Region 3 (35%), and Region 6 with 17%.

Table B-7: IRPTN: Developable Land (Stations and Lines) – Alternative Alignment by Region

| | Developable Area | Residential Area | Residential Units | | | | Residential Units | | | |
|--------------------------|------------------|------------------|-------------------|---------------|---------------|----------------|-------------------|---------------|-------------|-------------|
| | | | High Income | Middle Income | Low Income | TOTAL | High Income | Middle Income | Low Income | TOTAL |
| IRPTN NETWORK | ha | ha | | | | | | | | % |
| Region 1 | 640 | 470 | 3 759 | 5 842 | 27 987 | 37 588 | 6% | 10% | 36% | 19% |
| Region 2 | 187 | 159 | 6 524 | 4 231 | 2 004 | 12 758 | 10% | 7% | 3% | 6% |
| Region 3 | 1339 | 848 | 15 410 | 25 277 | 27 120 | 67 807 | 24% | 44% | 35% | 34% |
| Region 4 | 509 | 381 | 16 306 | 10 150 | 4 049 | 30 505 | 26% | 18% | 5% | 15% |
| Region 5 | 93 | 55 | 804 | 585 | 3 010 | 4 399 | 1% | 1% | 4% | 2% |
| Region 6 | 711 | 569 | 21 087 | 11 271 | 13 160 | 45 519 | 33% | 20% | 17% | 23% |
| Region 7 | 0 | 0 | - | - | - | - | 0% | 0% | 0% | 0% |
| TOTAL Alternative | 3479 | 2482 | 63 890 | 57 357 | 77 330 | 198 577 | 100% | 100% | 100% | 100% |
| % | | | 32% | 29% | 39% | 100% | | | | |

Feasibility studies are currently conducted on the abovementioned land parcels to confirm the development potential. Privately owned portions have also been identified for acquiring and partnerships.

The Intervention Programme¹⁵ aimed at promoting higher density, mixed income (Inclusionary Housing) and mixed land use developments around the IRPTN and nodal network will also be

¹⁴ Source: City of Tshwane Department of Human Settlements

¹⁵ The intervention Programme essentially comprises of the following three initiative: Breaking New Ground/Inclusionary Housing; Social Housing and Community Residential Units focusing on affordable rental stock and Medium to higher density full ownership housing (fully subsidised walk-ups).

considered. This Programme supports the following two objectives as reflected in the Tshwane Spatial Development Strategy:

- to provide as many affordable housing opportunities in central parts of the city as possible, according to the higher density affordable housing model;
- provision of institutional (social) housing (rental accommodation) in central areas.

The figure below shows the spatial distribution as described above:

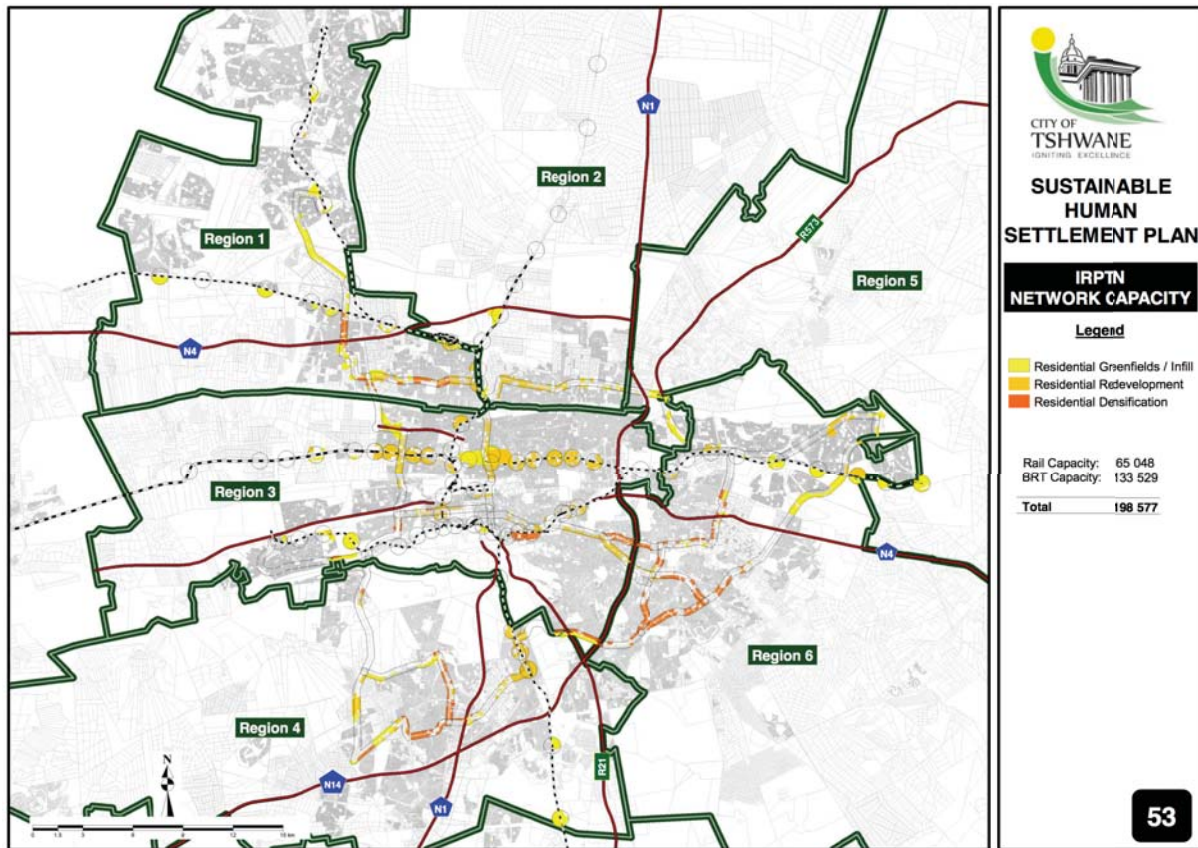


Figure B-39: Possible housing development along IRPTN, Sustainable Human Settlement Plan 2014

B.1.3.3 Alignment of Public Transport and Economic Opportunities

In figure below, the existing and planned BRT network serves the areas of work opportunities substantially. If the BRT system is completed in 2028 as planned, workers will be able to access most projected areas of employment in Tshwane by BRT.

The City’s IRPTN Network makes provision for the rollout of a public transport network which aims to link underserved townships with urban cores – a strategy that aligns with the Urban Network Structure. This concept of linkage is expanded by the City by encouraging development along the IRPTN Network by means of densification and compaction: in essence this approach aims to:

- Enable fruitful spending;
- Discouraging sprawl;
- Secure land value;
- Optimising urban infrastructure usage;

- Stimulate economic activity in areas with economic potential; and
- Conserve valuable agricultural land.

The IRPTN identifies these linkages and are referred to as Activity Corridors. The Urban Network Structure interprets the concept of activity around linkages between places of residence to economic nodes, by defining the said area as Integration Zone. Development along the Integration Zone is ideal from the City's perspective, but also hold various and diverse advantages for the citizens and users of Tshwane.

Spatial transformation is at the core of addressing the issues faced. While the tendency has been to suggest that transport can lead to spatial restructuring, the reality is more complex. Transport and land use are dependants of each other. Public transport can serve as a catalyst to land intensification but will not automatically achieve spatial restructuring. The investments and ongoing densification of the corridors alongside the said public transport intervention needs to be matched by the City to ensure spatial transformation by means of social equality.

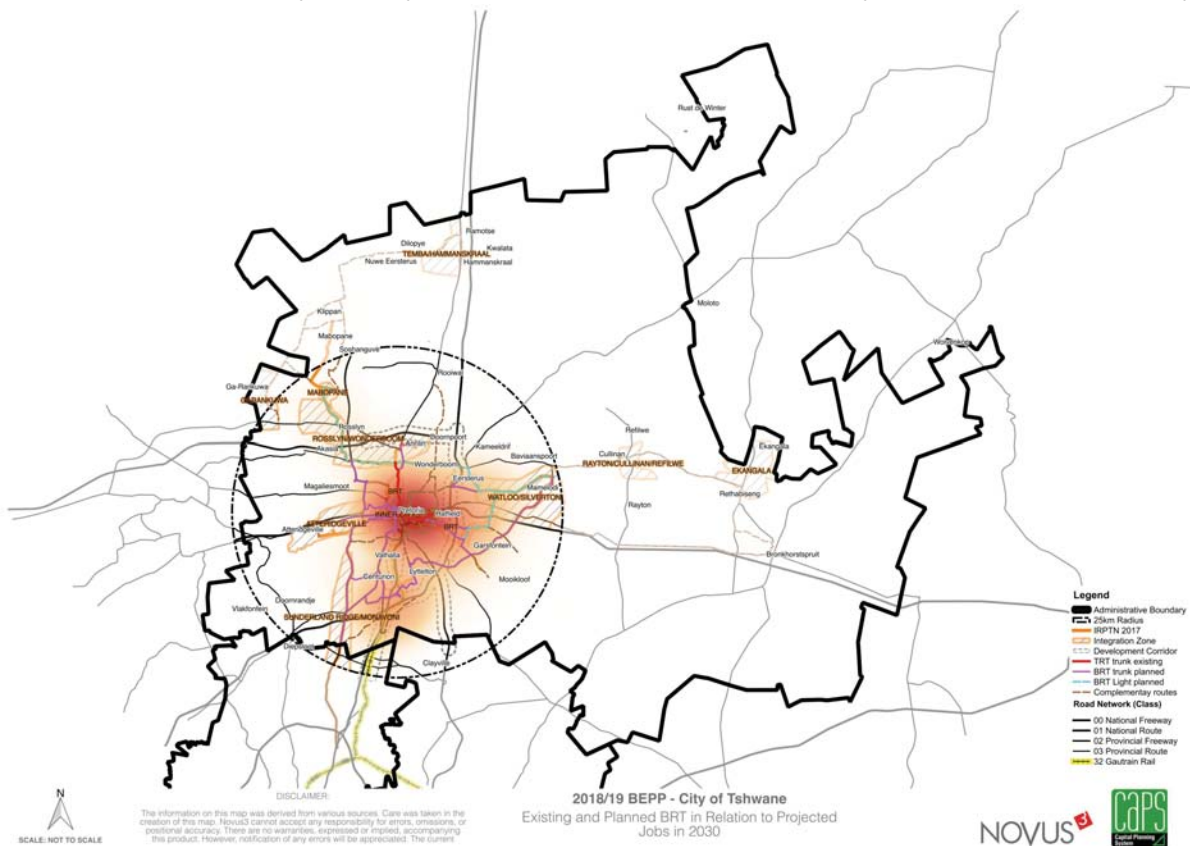


Figure B-40: Existing and Planned BRT Network in relation to projected jobs in 2030

B.1.3.4 Synthesis of Urban Network Identification Process

As described earlier, spatial targeting is the deliberate focus of a particular action on a particular spatial area, and in a legislative and performance measurement environment it is a useful tool to help achieve objectives more efficiently. Spatial targeting is only possible once the spatial distribution of potential beneficiaries is known as well as the scope of your actions.

The City has not only shown the spatial distribution of its people it serves, but also the characteristics of the said people. The City has continued to show services provided to the various areas and has elaborated on the relationship between the residing population and the

infrastructure provided. The City also discuss the aforementioned not only in terms of the status quo, but in terms of the projected population distribution across the city and the economic opportunity distribution.

The following table serves a summary of the complex synthesised process, combining various elements pertaining to:

- Socio Economic Characteristic;
- Transport Networks and Movement Patterns;
- Population Distribution and Housing Provision; and
- Development Trends.

The above-mentioned analysis elements therefore inform the Urban Network Structure of the City which are the City’s Spatial targeting framework.

B.1.3.5 Urban Network Structuring Elements

B.1.3.5.1 Central Business District

The Central Business district are defined as an area for focused regeneration and management. The figure below shows the location of the City of Tshwane’s Capital Core.



Figure B-41: City of Tshwane – Capital Core

Areas include:

- Inner City

The Tshwane Inner city is identified as the Capital Core as it is the city's first order node amongst all metropolitan nodes. Traditionally, the inner city is also the Central Business District (CBD) of major cities. Tshwane is no different. Historically, the inner city was the geographic heart and centre of what is now the Tshwane area. Over time, though, due to the extension of the Tshwane boundaries, the Inner City is no longer geographically central, but still plays a very important role with regards to the concentration of retail, office and government buildings to be found in the area.

B.1.3.5.2 Urban Hubs

Urban Hubs includes both traditional and emerging centres of economic activity, within which mixed used development is to be encouraged and managed. The figure below shows the location of the City of Tshwane's Urban Hubs.



Figure B-42: City of Tshwane – Urban Hubs

Areas include:

- Akasia
- Bronkhorstspuit
- Brooklyn
- Centurion
- Menlyn
- Rosslyn
- Wonderboom

Identified as primary nodes of the highest order. Metropolitan nodes accommodate the highest degree of specialisation services and offer a wide range of these services. Often, metropolitan nodes will have regional and/or provincial relevance. Equally important is that these nodes serve as economic hubs and focal points for employment opportunities. The role of the public sector in such nodes is to manage the pace of growth, provide infrastructure in line with the growth management plan and maintain the urban environment. Such localities are also where the most extensive land use rights, including densities, are likely to be supported, also in line with the growth management strategy

B.1.3.5.3 Smaller Nodes

Smaller Nodes includes areas of economic activity within which mixed-use development is to be promoted. The figure below shows the location of the City of Tshwane's Smaller Nodes.

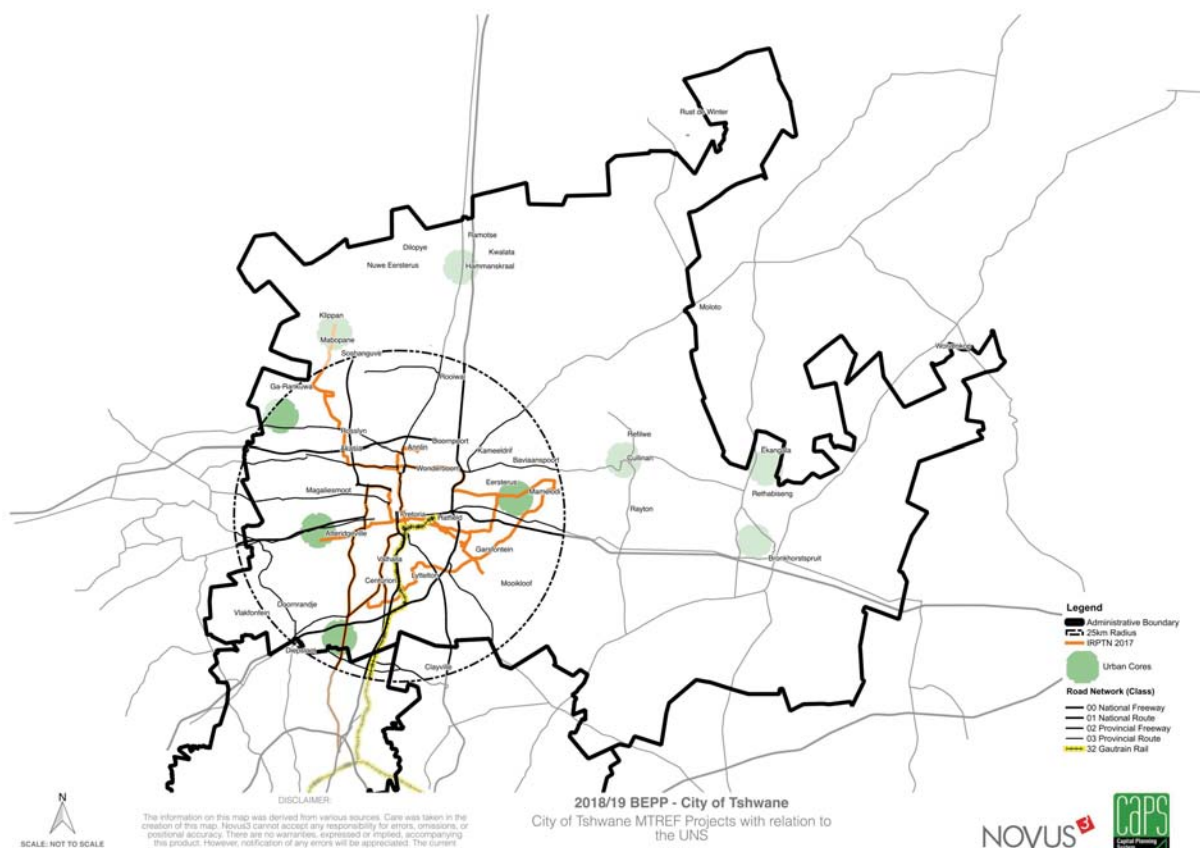


Figure B-43: City of Tshwane – Smaller Nodes

Areas include:

- Akasia
- Bronkhorstspuit
- Cullinan
- Ekangala
- Garankuwa
- Hammanskraal
- Hazeldean
- Irene

- Mabopane
- Mamelodi
- Monvia
- Olivenhoutbosch
- Rayton
- Refilwe
- Roslyn
- Silverton
- Sunderland Ridge
- Temba
- Watloo
- Wonderboom
- Woodlands

former township areas are a result of forced relocation programmes. Inevitably, these townships grew to accommodate large populations of low income or unemployed people. The economic circumstance was clearly evident in the quality of the physical environment. Under the new government which was established in 1994, these township areas were identified, not as a blight in the urban fabric as previously thought of, but as beacons of opportunity, through the human capital that was concentrated within the various communities of the townships. Due to the great need that often belies such nodes, Tshwane needs to play a more active role in social and economic restructuring, especially in view of the limited private investment, relative to Metropolitan cores. The Neighbourhood Development Programme (NDPG) is a lead City programme and the main instrument 'township renewal'. Zithobeni ((in the former Kungwini), Ekangala (in the former Kungwini) and Refilwe (in the former Nokeng Tsa Taemane); are identified as Urban Cores in the MSDF of the City of Tshwane.

B.1.3.5.4 Marginalised Areas

Marginalised areas are areas, primarily residential in purpose with related land uses, which are in decline and/or where people are deprived. They are typically informal settlements and dormitory residential townships in need of redress. The figure below shows the location of the City of Tshwane's Marginalised Areas.



Figure B-44: City of Tshwane – Marginalised Areas

Areas include:

- Eersterust
- Ekangala
- Garankuwa
- Hammanskraal
- Mabopane
- Mamelodi
- Olivenhoutbosch
- Soshanguve
- Temba

B.1.3.5.5 Activity Corridors

Activity Corridors are described as areas along rapid public transport which connect the urban hubs and the CBD, where high-density land development is to be promoted. The figure below shows the location of the City of Tshwane’s Activity Corridors.

Areas include:

- Brooklyn
- BRT Phase 1
- Hatfiled
- Menlyn



Figure B-45: City of Tshwane – Activity Corridors

B.1.3.5.6 Integration Zones

Integration Zones are areas which represent a collective of all other typologies and form the prioritised spatial focus areas for coordinated public intervention. The figure below shows the location of the City of Tshwane’s Integration Zones.



Figure B-46: City of Tshwane – BEPP Integration Zones

Areas include:

- Akasia
- Atteridgeville
- Bronkhorstspuit
- Brooklyn
- BRT
- Cullinan
- Ekangala
- Garankuwa
- Hammanskraal
- Hatfield
- Inner City
- Mabopane
- Mamelodi
- Menlyn
- Monovia
- Olivenhoutbosch
- Rayton
- Refilwe
- Roslyn
- Silverton
- Sunderland Ridge
- Temba

- Watloo
- Wonderboom

B.1.3.5.7 Combined UNS



Figure B-47: City of Tshwane – Combined UNS

B.1.4 Parallels between the City’s Planning framework and the Urban Network Structure

To conclude this part of the section, it is important to understand how the BEPP Urban Network Structure relates to the City’s official Spatial Development Framework. The following figure explains the relationship between the City’s planning framework and the Urban network structure in terms of the Urban Network Structure:

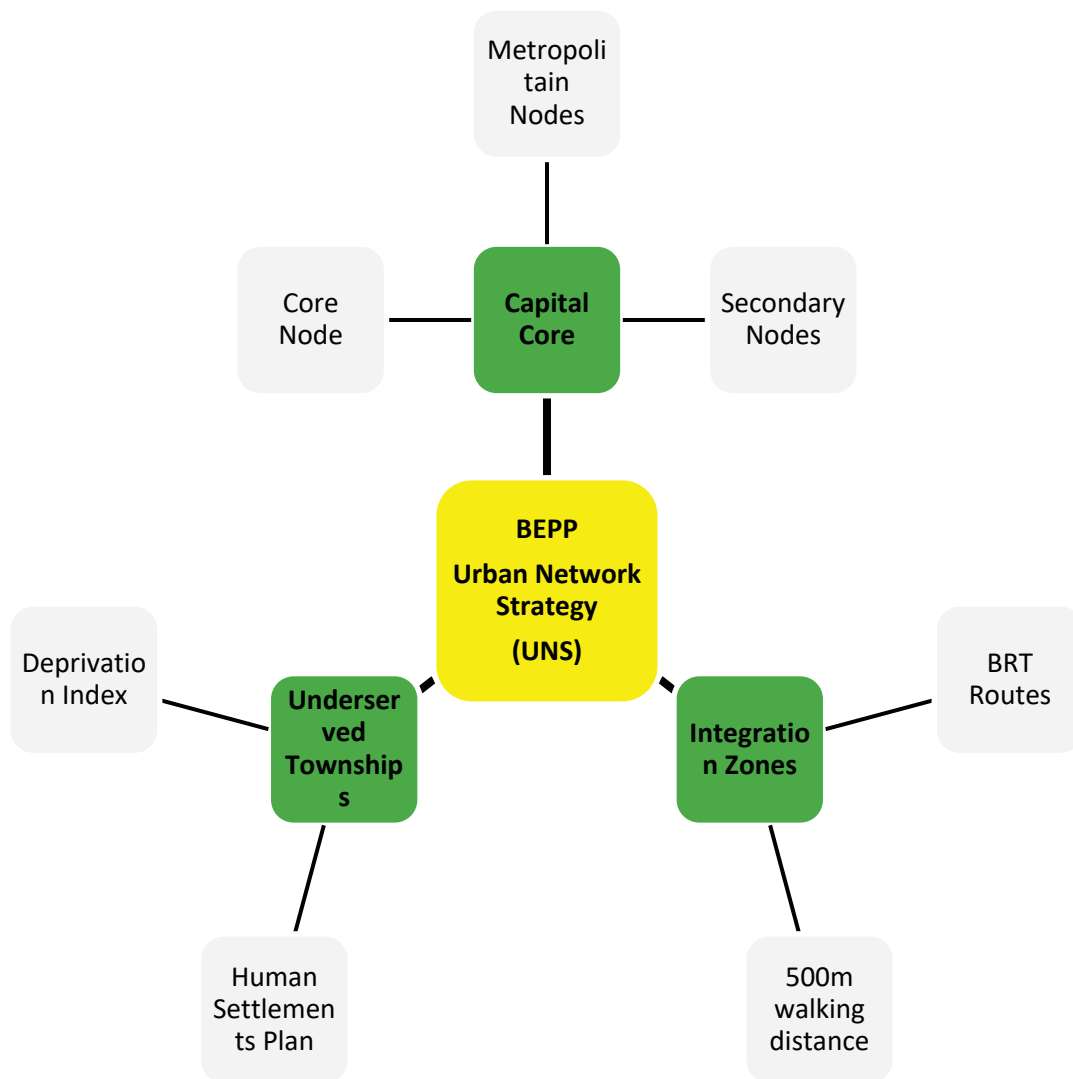


Figure B-48: Relationship between the City’s planning framework and the BEPP Urban Network Structure

The City of Tshwane current spatial framework, as required by the municipal Systems Act (2000), is the Tshwane Metropolitan Spatial Development Framework (MSDF) of 2012¹⁶. The MSDF has defined a hierarchy of nodes. The nodal typologies as per the Spatial Development Framework are as follows:

- Metropolitan Nodes: these are primary nodes of the highest order. These nodes accommodate the highest degree of service specialisation and offer the widest range of services. Often, metropolitan nodes will have regional/provincial relevance. In the context of Tshwane, Metropolitan nodes are those nodes within the City benefiting from the investment of the private sector. Equally important is that these nodes serve as economic hubs and focal points for employment opportunities. The role of the public

¹⁶ A new Spatial development Framework for the City of Tshwane is being developed, but will only be of effect at the end of this financial year.

sector in such nodes is to manage the pace of growth, provide infrastructure in line with the growth management plan and maintain the urban environment. Such localities are also where the most extensive land use rights, including densities, are likely to be supported, also in line with the growth management strategy.

- Urban Cores: former township areas were a result of forced relocation programmes. Inevitably, these townships grew to accommodate large populations of low income or unemployed people. The economic circumstance was clearly evident in the quality of the physical environment. Under the new government which was established in 1994, these township areas were identified, not as a blight in the urban fabric as previously thought of, but as beacons of opportunity, through the human capital that was concentrated within the various communities of the townships. Due to the great need that often belies such nodes, Tshwane needs to play a more active role in social and economic restructuring, especially in view of the limited private investment, relative to Metropolitan cores. The Neighbourhood Development Programme (NDPG) is a lead City programme and the main instrument 'township renewal'. Zithobeni, Ekangala and Refilwe are presented as Urban Cores.
- Emerging nodes: over the past few years, certain economic, social and/or residential opportunities have begun to emerge in various localities in the city. The realisation of these localities into fully fledged nodes will depend on a number of factors. While the future of these nodes is uncertain, the potential for greater development is clear. Identifying future urban areas also provides an opportunity to plan for the provision of new infrastructure and timely planning for growth that is sustainable. Cullinan is presented as Emerging nodes.

The City identified nodes as described above as follows:

Figure B-49: City of Tshwane nodal hierarchy

| Node | Areas within Node | |
|----------------------------|--|---|
| The Capital Core | CBD | |
| Metropolitan Nodes | Akasia; Kolonnade; Brooklyn; Hatfield; Menlyn; Centurion; Bronkhorstspuit | |
| Urban Cores | Hamanskraal/Temba; Mabopane/Soshanguve; Ga-Rankuwa; Atteridgeville/Saulsville; Mamelodi; Ekangala; Refilwe Zithobeni; Olievenhoutbosch | |
| Emerging Nodes | Soshanguve/Kopanong; Pretoria North/Rainbow Junction; Hazeldean; Woodlands; Wingate Park; Irene; Monovani. | |
| Specialised Activity Areas | Industrial Estates | Babelegi; Ga-Rankuwa; Rosslyn; Kelksoord; Kirkney; Hermanstad; Pretoria Industrial; Sunderland Ridge; Rooihuiskraal; Irene; Hennospark; Samcor Park; Waltloo; Silvertondale; Koedoespoort; Silverton; Ekandustria. |
| | Research, Innovation, Education and Technology Institutes | Council for Scientific and Industrial Research (CSIR) and Innovation Hub (Blue IQ); Highveld Technopark; Human Science Research Council (HSRC); George Mukhari Academic Hospital; Onderstepoort Research Laboratory/Vetinary Institute; Steve Biko Academic |

| Node | Areas within Node |
|---------------|---|
| | Hospital; Tshwane University of Technology; University of Pretoria; Thaba Tshwane |
| Airports | Waterkloof Air Force Base; Zwartkop Air Force Base |
| Tourism Nodes | Dinokeng Nature Reserve; Cullinan |



Figure B-50: Tshwane Nodal Hierarchy as per MSDF (2012)

According to the MSDF (2012), the following definitions apply to the spatial structuring elements of the City of Tshwane’s movement network:

- **Mobility Corridor:** The primary reason for the existence of this type of corridor is to move large numbers of people from one point to another in the city and often over relatively long distances. This corridor will typically move people from the peripheral areas to work opportunities and back during the day. Because of the long distances separating many people from their work opportunities there is a great need to move people around the city during peak hours in the fastest, most cost-effective manner with as little stops as possible between the origins and destinations.
- **Activity Corridor:** The integration between land use, economic activity and movement is the key function of this corridor. People do not only move between the two outer points of the corridor but also between various points along the corridor. A mature activity corridor displays most of the positive aspects associated with activity corridors, such as high residential densities and high non- residential land use intensities. Such a corridor will be most appropriate in the more central parts where several nodes with a certain degree of intensity and mix of uses already exist in relative proximity to each other.

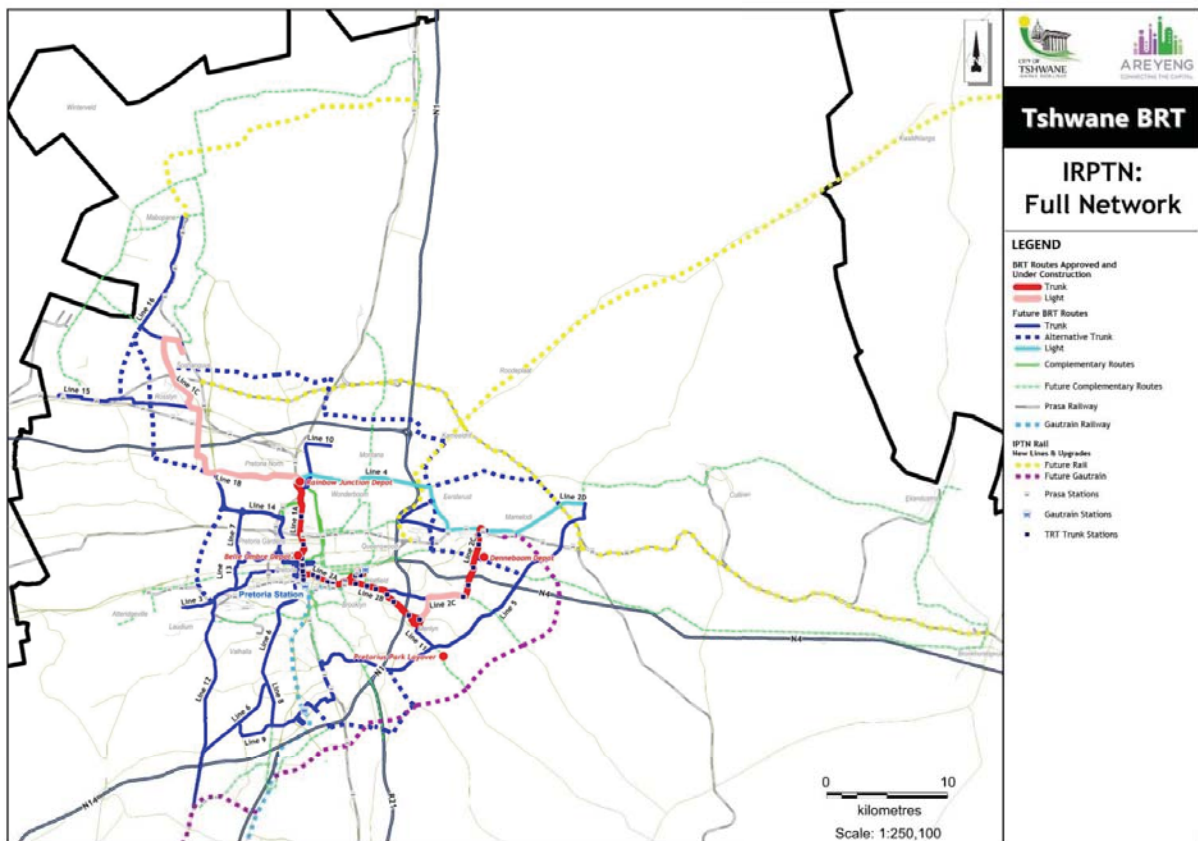


Figure B-51: Integrated Rapid Public Transport Network, A Re Yeng Operation Plan 2016-2028

The following table shows the relation between the Urban Network Structure as per National Treasury and the Tshwane Metropolitan Spatial Development Framework 2012.

Table B-8: Relationship between the UNS and the MSDF

| Urban Network Structure (National Treasury Terminology) | Tshwane Metropolitan Spatial Development Framework 2012 (City of Tshwane Terminology) |
|--|---|
| Central Business District (CBD) | Metropolitan Nodes |
| Urban Hubs | Urban Cores |
| Smaller Nodes | Emerging Nodes |
| Activity Corridors | Activity Corridor |
| Secondary Transport | Mobility Corridor |
| Integration Zones ¹⁷ | Activity Spine Mobility Spine |

¹⁷ Since the Development of the 2012 MSDF the understanding and approach toward integration Zones in the City has matured and considers various other elements additionally to the Activity Spine and Mobility Spine.



Figure B-52: MSDF 2012 in terms of Treasury's Urban Network Structure

B.2 Planning For Priority

In South Africa, the capital expenditure of a city should primarily be driven the IDP. The regulations published in MFMA Circular No. 80 (Municipal Finance Management Act No. 56 of 2003), compels all municipalities to ground their capital expenditure in the IDP process. SPLUMA Chapter 4 furthermore compels local authorities to formulate a Capital Information Framework (CIF). The meaningful allocation of capital expenditure for municipalities is however a challenging balancing act that must seek to address:

- Infrastructure backlogs,
- The restoration of human dignity,
- The creation of a safe and secure environment,
- The provision of basic services,
- The maintenance of existing assets,
- The protection of our heritage and environment,
- The creation of sustainable job opportunities,
- The boosting and creation of economic activities/opportunities and
- Strategically investing into a growing, sustainable, liveable and globally competitive city environment.

A prioritisation methodology is therefore required that will consider qualitative, quantitative and spatial priorities as articulated by municipality's strategic as well as technical leadership, and as enshrined by municipality's various strategic plans such as the MSDFs, the RSDFs and the IDP. It is recognised that the planning environment is continuously changing in response to new challenges and new dynamics gets introduced constantly due to a variety of reasons. The process of prioritisation therefore, must possess of the ability to comprehensively on-board new issues for consideration and easily, and most importantly transparently, adapt and change to the changing needs of the municipality.

The need for a mechanism to drive the strategic, yet equitable, allocation of capital within the city, stems from the following realities:

- Urbanisation, immigration and growth
"The State of South African Cities" report produced Cities Support Network in 2016, report that South African Cities are inundated by rapid urbanisation. A significant number of the population within South African cities has low levels of education resulting in high unemployment, very low incomes and poor living standards. There are not enough job opportunities for unskilled labourers in economy to address this issue adequately.

Because of this urbanisation, cities must deal with a relentless demand for infrastructure and services. Unconstrained urbanization and population growth have resulted in the demand for infrastructure and services outstripping the financial resources of cities. Given the limited resources to address these needs, prioritization of capital expenditure has become a factor of critical importance.

- The importance of the city and regional economy
One of the main drivers of economic sustainability is the creation of job-opportunities. Affecting economic changes requires a multi-pronged approach involving a range of interventions across a number of industries. From a capital expenditure perspective though, the process of prioritisation can benefit from the sophistication of a complex, macro-economic econometric model.

- Increasing Maintenance Burden

Cities are faced with the conundrum of balancing spatial, social and economic transformation, whilst maintaining the existing asset base of the city. Spatial, social and economic transformation is often associated with the provision of new, quality infrastructure in support of liveable communities either in newly demarcated development areas or as part of upgrading severely marginalized communities, with a poor service provision history and a backlog of service delivery demands.

A balanced approach to capital spending, focusing partially on the provision of new infrastructure, whilst maintaining the existing asset base and revenue stream is important. A fundamental consideration of all capital expenditure therefore must include the estimated OpEx burden that will result from the capital that is being spent. The OpEx burden is inevitable – a situation can however arise whereby the OpEx continues to grow to the extent that it starts to impact on the available CapEx.

- Coordination and Inter-dependency

Capital project preparation is often undertaken in a non-integrated way in that the different departments, divisions and agencies plan and budget for capital projects in isolation from each other. This is not necessarily intended, it is simply a consequence of a large, multi-disciplinary organisation. Departments often have their own priorities and their own methods of determining such priorities. These methods vary in terms of sophistication and detail. The provision of municipal infrastructure requires integrated project planning and preparation. Therefore, a decision support system, which facilitates the coordination and integration between planning and infrastructure provision on a project preparation as well as an institutional level is critical.

- Competing Interests

Although basic services infrastructure (i.e. water, sanitation, electricity and solid waste management) is often as high on the community delivery agenda as social facilities and amenities (i.e. clinics, libraries, community facilities etc.), these different infrastructure types do not always receive equitable capital allocation. Often, income generating capital expenditure (i.e. capital spent on infrastructure which can yield some form of monetary return) receives larger quantities of capital budget than non-income generating infrastructure. A decision support system, which allows for scenario testing in relation to the ratio of income generating and non-income generating capital expenditure, taking into account the impact that this would have on the city's financial sustainability is required.

- Spatial Transformation Agenda

The spatial vision of South African cities seeks to transform the developmental landscape to become a more inclusive, efficient and equitable. Consequently, capital spending should be earmarked to drive the spatial transformation agenda which in turn will result in a spatially transformed and economically sustainable city structure. A decision support system, which enables capital project prioritisation, reporting and tracking quantitatively, qualitatively and spatially, is required to ensure that capital spending is focused on strategic spatial structuring areas to achieve the desired city spatial form.

The complexity and interdependency of these issues is very challenging, and each year, new considerations and priorities are introduced. The need for a system that assist in the facilitation of such a process, together with additional benefits of record-keeping, tracking and reporting is therefore evident.

The prioritisation process facilitated by a system, should be easy to understand and interpret whilst allowing for accessibility and input by its users on any level of detail required. Given the diverse range of different departments and divisions within the typical South African municipality and the divergent needs stemming from each department, it is essential that the prioritization methodology lends itself towards participation and allows for easy calibration by key decision makers.

In the process of prioritization, the importance of a multitude of considerations must be emphasized. Although it is commonly accepted that the municipality's IDP should be the primary driver of priorities, there are however many other metrics that should be considered in the process. Some of these considerations are briefly highlighted.

The first fundamental to consider is funding that is available for implementation and how this capital is sourced. This informs of the affordability of implementing the list of capital needs. In a municipal environment, capital is sourced from a number of places. Among these sources are bonds and loans. The affordability and the debt thresholds set by the MFMA are important considerations in this process.

Technical inputs stemming from the municipality's asset management system or from other technical reports or processes represent another important aspect to consider in the process of prioritization. These technical inputs often do not align optimally with IDP objectives but are important all the same due to age, wear or other important reasons. Other technical aspects such as the technical interdependence of projects also play an important role. This will have the consequence that projects that appear to be of a lower priority, may be elevated in importance if they are enablers of other, important projects.

The economic, socio-economic and environmental impacts also represent impact lenses that casts an important perspective on project impacts. There are various methods and models to determine these impacts to varying degrees of accuracy. Within a service delivery framework, it is essential that these elements be included in the prioritization process.

Lastly and very importantly, the spatial alignment of a project to a municipality's strategic or political objectives needs to be included in prioritization process. The assumption is often erroneously made that these spatial aspects are adequately captured by the IDP process. The reality is however more complex and dynamic. Spatial priorities are often revealed throughout the IDP cycle by new processes such as the development of Strategic Development Frameworks (SDFs).

B.2.1 Purpose of a Capital Prioritisation Model

The Capital Prioritisation Model (CPM) of the City of Tshwane is a systematic and objective methodology that provides a way to sort a diverse set of items / projects into an order of importance based on each project's alignment to the strategic, developmental, social, economic, environmental and financial objectives of the municipality. The CPM identifies each project's relative importance by deriving a numerical value representative of the project's priority.

The model provides a means for ranking projects (or project requests) based on criteria that are the most important to focus on first in terms of meeting the Metros overarching developmental objectives and strategies. This also assists in promoting co-ordinated and aligned departmental planning and budgeting.

Project prioritisation can therefore be described as a process for assessing a project against a number of variables such as, economic, social, environmental, legislative and financial variables, in order to determine a capital project's alignment with or contribution to such variables. It provides for a systematic and objective assessment of an ongoing or completed project. All the impacts associated with a capital project are identified, and where possible, costs and benefits valued in monetary terms, so as to ensure that project prioritised and selected by government will provide the maximum net benefit to the community, economy and environment – the balancing effect.

B.2.2 Capital Prioritisation Model Mathematical Framework

The prioritisation process should be easy to understand and interpret whilst allowing for accessibility and input by its users on any level of detail required. Given the diverse range of different departments and divisions within the municipality and the divergent needs stemming from each, it was deemed essential that the methodology lends itself towards participation and allows for easy calibration by key decision makers.

To fully take into account all factors relevant in deciding which projects to receive priority, the utility analysis method is used that takes all the relevant system constraints into account.

“Utility analysis is in effect a semi-quantitative means of ‘trading off’ the effects of implementing any given scheme, that is, the relative desirability of achieving a given set of goals and objectives and the degree to which this target system is fulfilled, are combined to give a measure of how far each scheme will go in meeting all or any of the goals and objectives, and so provides the answer to the question of effectiveness of the scheme. The distinguishing feature of utility analysis is that it can handle financial, quantitative and qualitative effects simultaneously. Consequently, all of the impacts or effects of a project which can be envisaged can be included in the analysis.” – Evaluation of Transportation Projects – Utility Analysis; JV Baxa; January 1981; CSIR.

A utility analysis provides a structured input for the decision-maker. It provides an indication to the overall effectiveness with which alternatives will satisfy the complex target system. The process begins by defining the problem in a structured way. As already mentioned, the problem definition can incorporate diverse inputs which covers quantitative, qualitative and

financial factors. Firstly, certain goals that should ultimately be addressed, must be established. For each of these goals, relevant objectives then must be established. Each objective requires a specific input, which will be modelled based on a predetermined method or value function, to provide an output. The following basic steps apply:

- Define the relative preferences for each goal that was set out;
- Define relative preferences for each objective that was set out;
- Weight each criterion that was set up to reflect their relative importance.

By following these steps, each alternative can be 'scored' to attain a measurement of performance that can be translated into a number of points. The points system with which each criterion is weighted, as indicated on the matrix of utilities, is a number between 0 and 100.

The complexity of the number of issues that had to be taken into account in the model from the municipality's point of view, required that the model methodology had to be adapted to allow for more than one level of "objectives". Importantly, these objectives all contribute towards a fundamental set of goals. These goals possess of the ability to influence the way in which projects will be rated rather dramatically. The benefit of this is that the municipality now has the ability to fix the fundamental considerations on this level, to ensure that it manifests in prudent financial management whilst still ensuring that the radical transformation as contained in the various city strategies, manifests itself at this level.

The figure below shows the basic structure of the model. More about the actual criteria that will be used is discussed later in this document.

The application of this methodology in CAPS had to find a balance between complexity and simplicity. This is required to ensure participation in the process by a very broad range of departments and divisions within departments. Not all departments are technically focussed to the same level of sophistication – as is the case with the infrastructure departments. It is therefore necessary to find criteria and measurements that do not exclude such department.

This approach offers a significant advantage in that the "principles" of prioritisation becomes important debating points, instead of individual merits projects. Projects emanating from different departments do not have "common ground" to enable a meaningful one-to-one comparison. Using this model though, provides a platform where all projects, irrespective of their origin or sophistication, is subjected to the same principles.

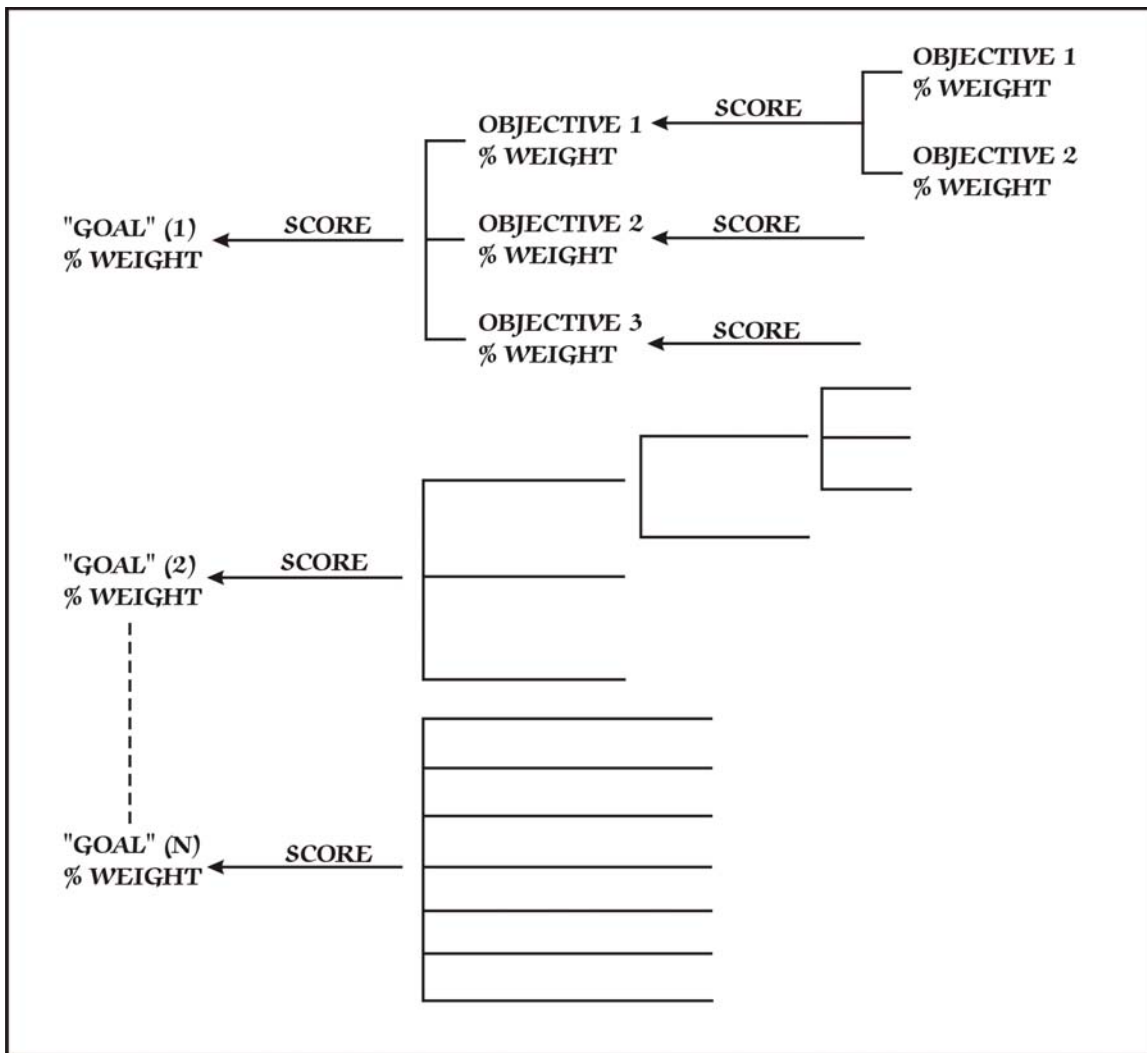


Figure B-53: Capital Prioritisation Model Mathematical Framework

B.2.3 Capital Prioritisation Model High-level Structure

The CPM allows for projects to be ranked or scored between two mutually exclusive branches, namely (Refer to Figure B-54):

- Spatially Mapped
- City Wide or Administrative Head Quarters

These two model branches are mutually exclusive, which means that any project can only pass through one of the two branches and can never be scored on both branches. Projects which have spatial locations (i.e. works and affected areas) are evaluated through the “Spatially Mapped” branch of the model, whereas unmapped projects marked under the MSCOA regional segment as “City Wide” or “Admin HQ” are evaluated through the “City Wide / Admin HQ” branch of the model. This distinction is made so that City Wide and Admin HQ projects are not artificially penalised under the “Spatial” branch of the prioritisation model.

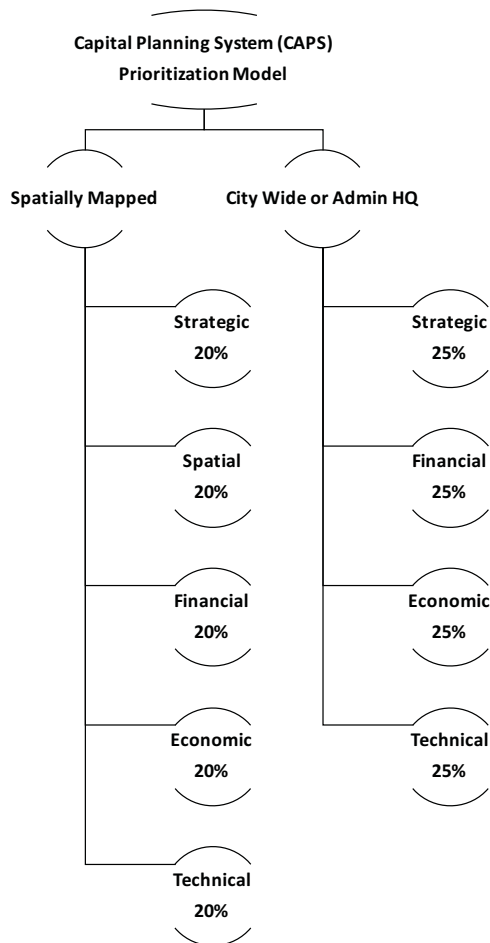


Figure B-54: Capital Prioritisation Model High Level Structure

Once it has been determined whether a project is spatially mapped or city wide, the project evaluation takes place according to the following themes or goals:

- Strategic alignment
- Spatial alignment
- Financial alignment
- Economic alignment
- Technical alignment

It is evident from the high-level tree structure above that the “Spatial alignment” theme is only utilised under the “Spatially Mapped” scorecard.

B.2.4 Capital Prioritisation Model Criteria

The capital prioritisation model criteria will be discussed in more detail under the five (5) themes or goals of the model, namely:

- Strategic alignment
- Spatial alignment
- Financial alignment
- Economic alignment
- Technical alignment

B.2.4.1 Strategic Alignment

The strategic alignment goal or theme of the prioritisation model evaluates the degree to which projects in the municipal capital budget aligns with the organisational policy and developmental objectives as well as strategic outcomes set out in various strategic documents of the municipality. These documents could include the organisations vision and mission statements, strategic plans, state of the city address, planning documents and other manifestos. The policy alignment score is calculated within three distinct categories, namely:

- Strategic Outcomes
- Deprived areas and basic services

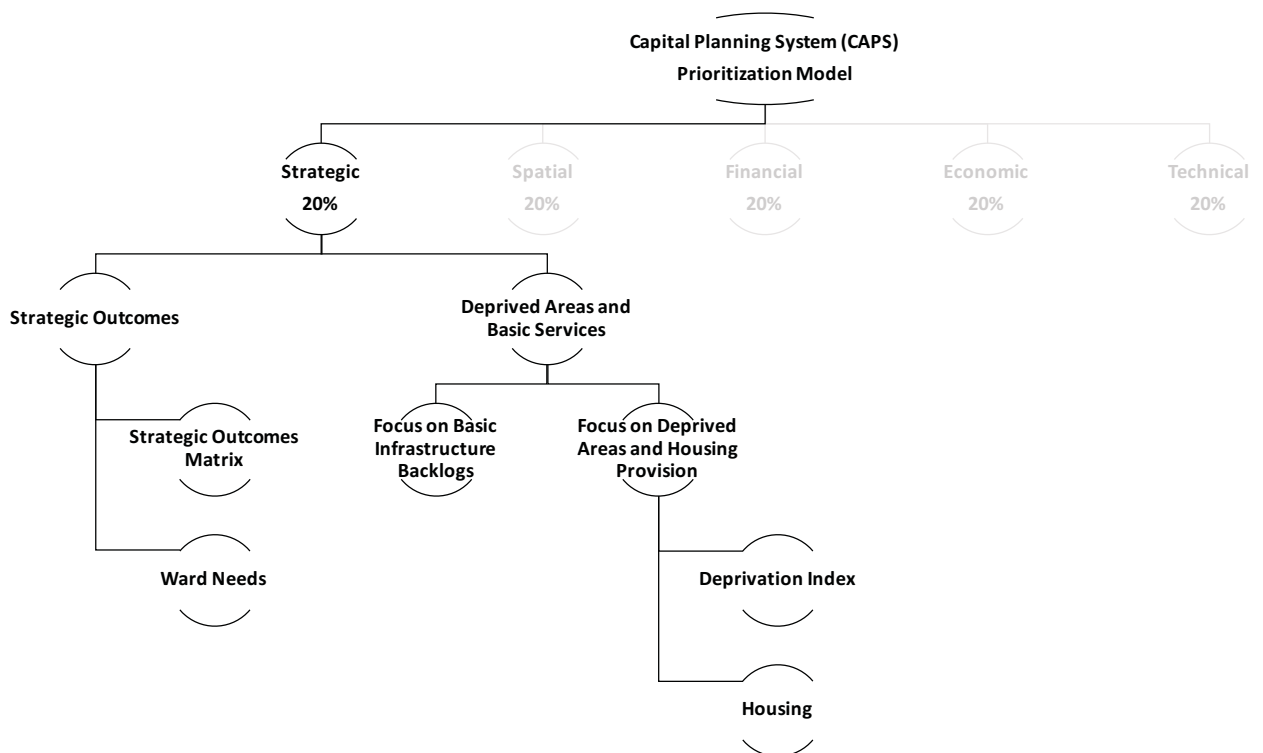
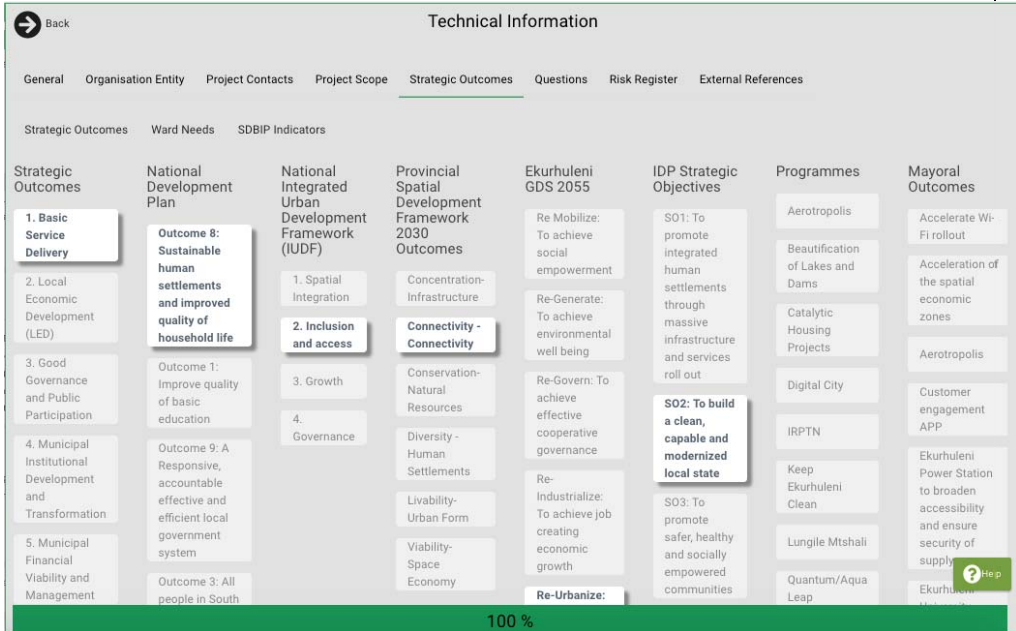


Figure B-55: Strategic Alignment

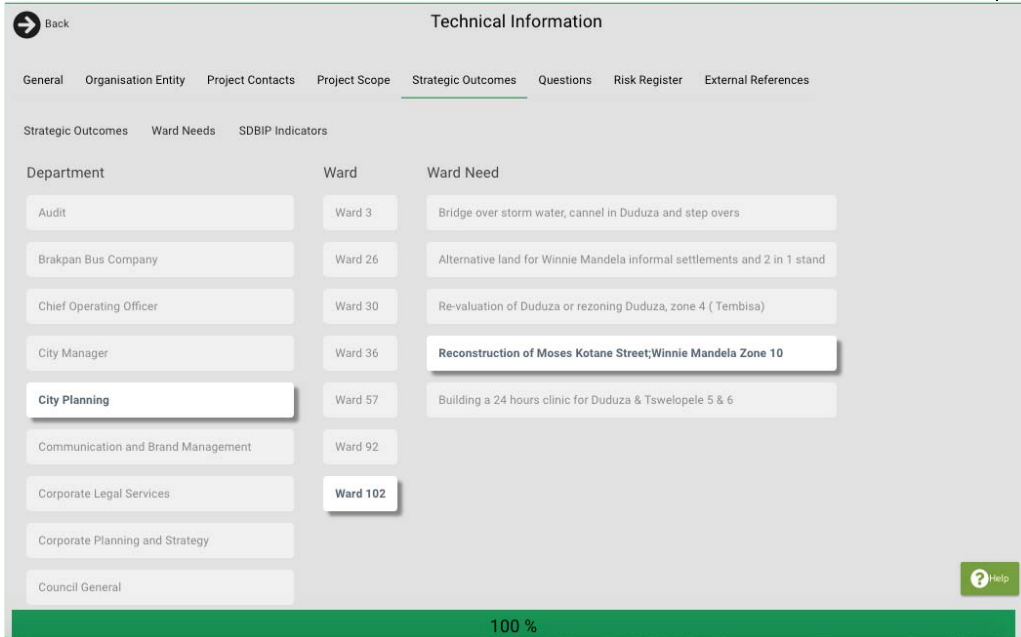
B.2.4.1.1 Strategic Outcomes

Table B-9: Strategic Outcomes Alignment

| Category | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|---|---|----------------------------------|---|------------|------------------|---------------------------|---|------------------------|------------------------------|--|---|--------------|--------------------------|-------------------------------------|---|-------------------------|-----------------------------|--|---|----------------------------------|--|---|--|-----------|--------------------------------|--|---|----------------------------|--------------|---|--------------------------------|---------------|-------------------------------|---|--------------|--------------|-------------------------|---|--|--|------------------------|--|--|-------|---|--|--|--|--------------------------|--|--|-----------------------|------------|--|--|--|--|--|--|-----------------|--|--|--|--|--|--|--|-------------------|--|
| Definition | <p>The strategic outcomes matrix measures the alignment of a project to the various strategic outcomes pronounced on through the different spheres of government. The following hierarchy of strategic outcomes is measured:</p> <ul style="list-style-type: none"> • National: Key Performance Areas • National: National Development Plan (NDP) • National: National Integrated Urban Development Framework (IUDF) • Provincial: Spatial Development Framework 2030 Outcomes • Municipal: Ekurhuleni Growth and Development Strategy (GDS) 2055 • Municipal: Integrated Development Plan (IDP) Strategic Objectives • Municipal: Integrated Development Plan (IDP) Programmes • Municipal: Mayoral Outcomes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Branch Weight | 100% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Input Variables | <p>The strategic outcomes matrix should be populated for each project using the Strategic Outcomes Matrix (shown below):</p>  <p>The screenshot shows a web-based interface titled 'Technical Information' with a navigation menu including 'Strategic Outcomes'. Below the menu is a grid of outcome categories and their sub-items:</p> <table border="1"> <thead> <tr> <th>Strategic Outcomes</th> <th>National Development Plan</th> <th>National Integrated Urban Development Framework (IUDF)</th> <th>Provincial Spatial Development Framework 2030 Outcomes</th> <th>Ekurhuleni GDS 2055</th> <th>IDP Strategic Objectives</th> <th>Programmes</th> <th>Mayoral Outcomes</th> </tr> </thead> <tbody> <tr> <td>1. Basic Service Delivery</td> <td>Outcome 8: Sustainable human settlements and improved quality of household life</td> <td>1. Spatial Integration</td> <td>Concentration-Infrastructure</td> <td>Re Mobilize: To achieve social empowerment</td> <td>SO1: To promote integrated human settlements through massive infrastructure and services roll out</td> <td>Aerotropolis</td> <td>Accelerate Wi-Fi rollout</td> </tr> <tr> <td>2. Local Economic Development (LED)</td> <td>Outcome 1: Improve quality of basic education</td> <td>2. Inclusion and access</td> <td>Connectivity - Connectivity</td> <td>Re-Generate: To achieve environmental well being</td> <td>SO2: To build a clean, capable and modernized local state</td> <td>Beautification of Lakes and Dams</td> <td>Acceleration of the spatial economic zones</td> </tr> <tr> <td>3. Good Governance and Public Participation</td> <td>Outcome 9: A Responsive, accountable effective and efficient local government system</td> <td>3. Growth</td> <td>Conservation-Natural Resources</td> <td>Re-Govern: To achieve effective cooperative governance</td> <td>SO3: To promote safer, healthy and socially empowered communities</td> <td>Catalytic Housing Projects</td> <td>Aerotropolis</td> </tr> <tr> <td>4. Municipal Institutional Development and Transformation</td> <td>Outcome 3: All people in South</td> <td>4. Governance</td> <td>Diversity - Human Settlements</td> <td>Re-Industrialize: To achieve job creating economic growth</td> <td>Re-Urbanize:</td> <td>Digital City</td> <td>Customer engagement APP</td> </tr> <tr> <td>5. Municipal Financial Viability and Management</td> <td></td> <td></td> <td>Livability- Urban Form</td> <td></td> <td></td> <td>IRPTN</td> <td>Ekurhuleni Power Station to broaden accessibility and ensure security of supply</td> </tr> <tr> <td></td> <td></td> <td></td> <td>Viability- Space Economy</td> <td></td> <td></td> <td>Keep Ekurhuleni Clean</td> <td>Ekurhuleni</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Lungile Mtshali</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Quantum/Aqua Leap</td> <td></td> </tr> </tbody> </table> <p>A progress bar at the bottom of the screenshot shows 100% alignment.</p> | Strategic Outcomes | National Development Plan | National Integrated Urban Development Framework (IUDF) | Provincial Spatial Development Framework 2030 Outcomes | Ekurhuleni GDS 2055 | IDP Strategic Objectives | Programmes | Mayoral Outcomes | 1. Basic Service Delivery | Outcome 8: Sustainable human settlements and improved quality of household life | 1. Spatial Integration | Concentration-Infrastructure | Re Mobilize: To achieve social empowerment | SO1: To promote integrated human settlements through massive infrastructure and services roll out | Aerotropolis | Accelerate Wi-Fi rollout | 2. Local Economic Development (LED) | Outcome 1: Improve quality of basic education | 2. Inclusion and access | Connectivity - Connectivity | Re-Generate: To achieve environmental well being | SO2: To build a clean, capable and modernized local state | Beautification of Lakes and Dams | Acceleration of the spatial economic zones | 3. Good Governance and Public Participation | Outcome 9: A Responsive, accountable effective and efficient local government system | 3. Growth | Conservation-Natural Resources | Re-Govern: To achieve effective cooperative governance | SO3: To promote safer, healthy and socially empowered communities | Catalytic Housing Projects | Aerotropolis | 4. Municipal Institutional Development and Transformation | Outcome 3: All people in South | 4. Governance | Diversity - Human Settlements | Re-Industrialize: To achieve job creating economic growth | Re-Urbanize: | Digital City | Customer engagement APP | 5. Municipal Financial Viability and Management | | | Livability- Urban Form | | | IRPTN | Ekurhuleni Power Station to broaden accessibility and ensure security of supply | | | | Viability- Space Economy | | | Keep Ekurhuleni Clean | Ekurhuleni | | | | | | | Lungile Mtshali | | | | | | | | Quantum/Aqua Leap | |
| Strategic Outcomes | National Development Plan | National Integrated Urban Development Framework (IUDF) | Provincial Spatial Development Framework 2030 Outcomes | Ekurhuleni GDS 2055 | IDP Strategic Objectives | Programmes | Mayoral Outcomes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Basic Service Delivery | Outcome 8: Sustainable human settlements and improved quality of household life | 1. Spatial Integration | Concentration-Infrastructure | Re Mobilize: To achieve social empowerment | SO1: To promote integrated human settlements through massive infrastructure and services roll out | Aerotropolis | Accelerate Wi-Fi rollout | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Local Economic Development (LED) | Outcome 1: Improve quality of basic education | 2. Inclusion and access | Connectivity - Connectivity | Re-Generate: To achieve environmental well being | SO2: To build a clean, capable and modernized local state | Beautification of Lakes and Dams | Acceleration of the spatial economic zones | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. Good Governance and Public Participation | Outcome 9: A Responsive, accountable effective and efficient local government system | 3. Growth | Conservation-Natural Resources | Re-Govern: To achieve effective cooperative governance | SO3: To promote safer, healthy and socially empowered communities | Catalytic Housing Projects | Aerotropolis | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. Municipal Institutional Development and Transformation | Outcome 3: All people in South | 4. Governance | Diversity - Human Settlements | Re-Industrialize: To achieve job creating economic growth | Re-Urbanize: | Digital City | Customer engagement APP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. Municipal Financial Viability and Management | | | Livability- Urban Form | | | IRPTN | Ekurhuleni Power Station to broaden accessibility and ensure security of supply | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | Viability- Space Economy | | | Keep Ekurhuleni Clean | Ekurhuleni | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | Lungile Mtshali | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | Quantum/Aqua Leap | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Process | <p>Given that the strategic outcomes do not have different weights of importance across the different spheres of government, the scoring process of strategic outcomes utilises the extent to which a project aligns to strategic outcomes across all spheres of government. In other words, if a project aligns to strategic outcomes across all spheres of government, the progress bar will return 100% alignment. The project score is therefore deduced based on the progress bar value into scoring brackets.</p> <p>The above calculation is expressed by the following mathematical equation:</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Category | Description |
|-----------------------|--|
| | $y = \text{if}(x \geq 100, 100, \text{if}(x < 100 \text{ and } x > 90, 95, \text{if}(x \leq 90 \text{ and } x > 80, 85, \text{if}(x \leq 80 \text{ and } x > 70, 75, \text{if}(x \leq 70 \text{ and } x > 60, 65, \text{if}(x \leq 60 \text{ and } x > 50, 55, \text{if}(x \leq 50 \text{ and } x > 40, 45, \text{if}(x \leq 40 \text{ and } x > 30, 35, \text{if}(x \leq 30 \text{ and } x > 20, 25, \text{if}(x \leq 20 \text{ and } x > 10, 15, \text{if}(x \leq 10 \text{ and } x > 1, 5, 0))))))))))$ |
| Mathematical Operator | Maximum value achieved by the project on either of the two branches is passed through to the parent scoring branch. |

Table B-10: Alignment to Ward Needs

| Category | Description |
|-----------------|---|
| Definition | The ward priorities emanating from the community engagement process of the Integrated Development Plan is captured in the CAPS system according to the department responsible to address the ward need, the ward in which the ward need was identified and a description of the ward need raised by the community. The ward need matrix should be populated by each project to demonstrate the possible alignment between the ward need and the project. |
| Branch Weight | 100% |
| Input Variables | <p>The Ward Priority matrix should be populated for each project using the Ward Priority Matrix (shown below):</p>  <p>The screenshot shows a web interface titled 'Technical Information' with a 'Back' button. Below the title are several tabs: 'General', 'Organisation Entity', 'Project Contacts', 'Project Scope', 'Strategic Outcomes', 'Questions', 'Risk Register', and 'External References'. Under 'Strategic Outcomes', there are sub-tabs for 'Strategic Outcomes', 'Ward Needs', and 'SDBIP Indicators'. The main content area is a table with three columns: 'Department', 'Ward', and 'Ward Need'. The 'Department' column lists various departments, with 'City Planning' selected. The 'Ward' column lists ward numbers, with 'Ward 57' highlighted. The 'Ward Need' column contains descriptions of needs, such as 'Bridge over storm water, canal in Duduza and step overs' for Ward 3 and 'Building a 24 hours clinic for Duduza & Tswelopele 5 & 6' for Ward 57. At the bottom of the interface, a green progress bar indicates '100 %' alignment.</p> |
| Process | <p>Given that the ward priorities within the municipality all carry equal importance, the scoring process of ward priorities utilises the extent to which a project aligns to one or more ward priority. In other words, if a project aligns to one or more ward priorities, the progress bar will return 100% alignment. The project score is therefore deduced based on the progress bar value into scoring brackets.</p> <p>The above calculation is expressed by the following mathematical equation:</p> |

| Category | Description |
|-----------------------|--|
| | $Y = \text{if}(x=100, 100, \text{if}(x < 100 \text{ and } x \geq 90, 95, \text{if}(x < 90 \text{ and } x \geq 80, 85, \text{if}(x < 80 \text{ and } x \geq 70, 75, \text{if}(x < 70 \text{ and } x \geq 60, 65, \text{if}(x < 60 \text{ and } x \geq 50, 55, \text{if}(x < 50 \text{ and } x \geq 40, 45, \text{if}(x < 40 \text{ and } x \geq 30, 35, \text{if}(x < 30 \text{ and } x \geq 20, 25, \text{if}(x < 20 \text{ and } x \geq 10, 15, \text{if}(x < 10 \text{ and } x \geq 1, 5, 0))))))))))$ |
| Mathematical Operator | Maximum value achieved by the project on either of the two branches is passed through to the parent scoring branch. |

B.2.4.2 Deprived Areas and Basic Services

Table B-11: Deprivation Index

| Category | Description |
|-----------------|--|
| Definition | <p>Deprivation Index serves to elevate project scores which impact underserved areas as described in the National Treasury Urban Network Structure. The Deprivation Index is a spatial layer calculated from Statistics South Africa data at small area level for the Census 2011, which provides an indication of the level of impoverishment or lack of services across the municipality. The Deprivation Index considers the following indicators:</p> <ul style="list-style-type: none"> • Household Income (25%) • Household Size (5%) • Household Dwelling Type (5%) • Household Cooking (10%) • Household Heat (5%) • Household Light (5%) • Household Piped Water (20%) • Household Toilet (20%) • Household Refuse Disposal (5%) |
| Branch Weight | 50% |
| Input Variables | Project works location is used as the input to test the deprivation index score of each project based on the deprivation layer or area returned based on the spatial intersect between project works location and deprivation index shapefile. |
| Process | The Deprivation Index for municipality is shown below. The warmer the area (i.e. dark red) the higher the deprivation index value and consequently the level of poverty or lack of access to basic services. Projects with works locations overlapping or intersecting with areas with low levels of service delivery will receive elevated score. |

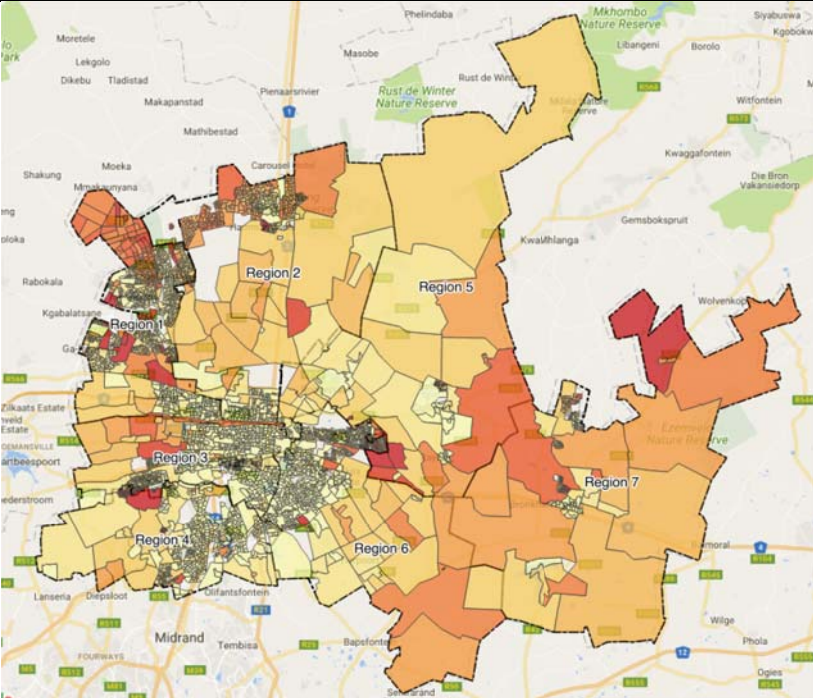
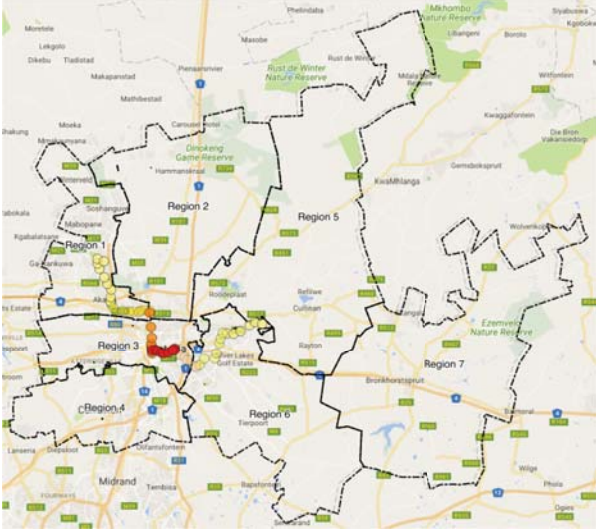
| Category | Description |
|-----------------------|---|
| |  <p data-bbox="488 958 624 1294"> 0 - 10 10 - 20 20 - 30 30 - 40 40 - 50 50 - 60 60 - 70 70 - 80 80 - 90 90 - 100 </p> <p data-bbox="488 1312 1377 1384">Projects without works locations (i.e. city wide or administrative head quarter projects) receive a base score of 50.</p> |
| Mathematical Operator | Maximum value achieved by the project is passed through to the parent scoring branch. |

Table B-12: Targeted Housing Typologies

| Category | Description |
|-----------------|---|
| Definition | <p>Transit Oriented Development (TOD) precincts have been defined in the Integrated Rapid Public Transport Network (IRPTN) plan in order to identify a hierarchy of investment priority areas towards densification and mixed-use investments. TOD precincts are used to prioritise mixed-use high-density housing developments.</p> |
| Branch Weight | <p>The different TOD phases have been weighed differently based on the anticipated implementation phasing, therefore projects focussing on implementing a precinct associated with early implementation phases of the IRPTN will receive elevated score. The following weighting applies:</p> <ul style="list-style-type: none"> • Phase 1a TOD = 100% • Phase 1b TOD = 75% • Phase 1c TOD = 50% • Phase 1d TOD = 40% • Phase 1e TOD = 25% • Phase 1f TOD = 15% |
| Input Variables | <p>Housing projects are pre-filtered during this scoring test so that housing project works locations are used as the input to test the geographic priority area score of each project based on the IRPTN TOD shapefile provided by the municipality. A score is returned based on the spatial intersect between project works location and IRPTN TOD shapefile.</p> |
| Process | <p>The IRPTN TODs for the municipality is shown below. If a the spatial intersect returns more than one IRPTN TOD area intersecting with a project works location, then the maximum score between the intersects is passed to the parent branch.</p>  <p>Projects without works locations (i.e. city wide or administrative head quarter projects) receive a base score of 50.</p> |

| Category | Description |
|-----------------------|---|
| Mathematical Operator | Maximum value achieved by the project is passed through to the parent scoring branch. |

Table B-13: Housing Projects

| Category | Description |
|-----------------------|---|
| Definition | The provision of affordable quality housing stock across a range of housing typologies and tenure options is a key focus for the City of Tshwane. Therefore, given the focus on providing new housing stock, the “Housing and Human Settlement” department is given additional priority based on the fact that they are responsible for meeting the housing stock mandate of the municipality |
| Branch Weight | 20% |
| Input Variables | Housing and Human Settlements projects are pre-filtered during this scoring test so that only housing projects receive elevated score during this test. |
| Process | All housing and human settlements project receive additional score based on their alignment with the city’s mandate of housing stock provision. |
| Mathematical Operator | Maximum value achieved by the project is passed through to the parent scoring branch. |

B.2.4.3 Spatial Alignment

The spatial alignment goal or theme of the prioritisation model evaluates the degree to which projects in the municipal capital budget aligns with the spatial development framework and other spatial targeting objectives set out in various strategic documents of the municipality (i.e. IDP, SDF, BEPP, CIF etc.). The alignment of projects to the spatial targeting areas of the municipality are scored according to the following criteria:

- Public Transport Corridors
 - IRPTN Corridors
 - TOD Precincts
- Urban Cores
- Specialised Nodes
- MSDF Nodal Hierarchy
- BEPP Integration Zones

These criteria measured under these sub-branches seek to ensure that projects within the municipal budget align with the spatial structure or spatial development objectives of the municipality.

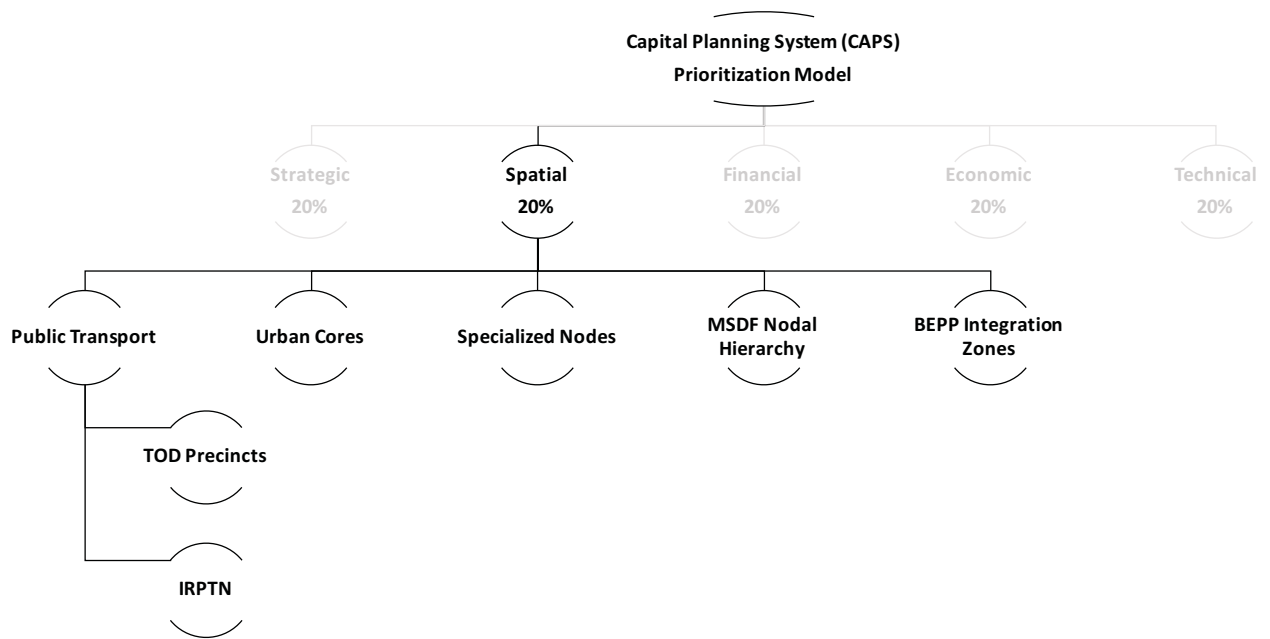


Figure B-56: Spatial Alignment

B.2.4.3.1 Public Transport

Table B-14: Public Transport – TOD Precincts

| Category | Description |
|-----------------|--|
| Definition | Transit Oriented Development (TOD) precincts have been defined in the Integrated Rapid Public Transport Network (IRPTN) plan in order to identify a hierarchy of investment priority areas towards densification and mixed-use investments. Six phases of TOD precincts have been identified based on the roll-out phasing of the IRPTN. Projects are scored based on their spatial intersect with the geographic priority areas. |
| Branch Weight | The different TOD phases have been weighed differently based on the anticipated implementation phasing, therefore projects focussing on implementing a precinct associated with early implementation phases of the IRPTN will receive elevated score. The following weighting applies: <ul style="list-style-type: none"> • Phase 1a TOD = 100% • Phase 1b TOD = 75% • Phase 1c TOD = 50% • Phase 1d TOD = 40% • Phase 1e TOD = 25% • Phase 1f TOD = 15% |
| Input Variables | Project works location is used as the input to test the geographic priority area score of each project based on the IRPTN TOD shapefile provided by the municipality. A score is returned based on the spatial intersect between project works location and IRPTN |

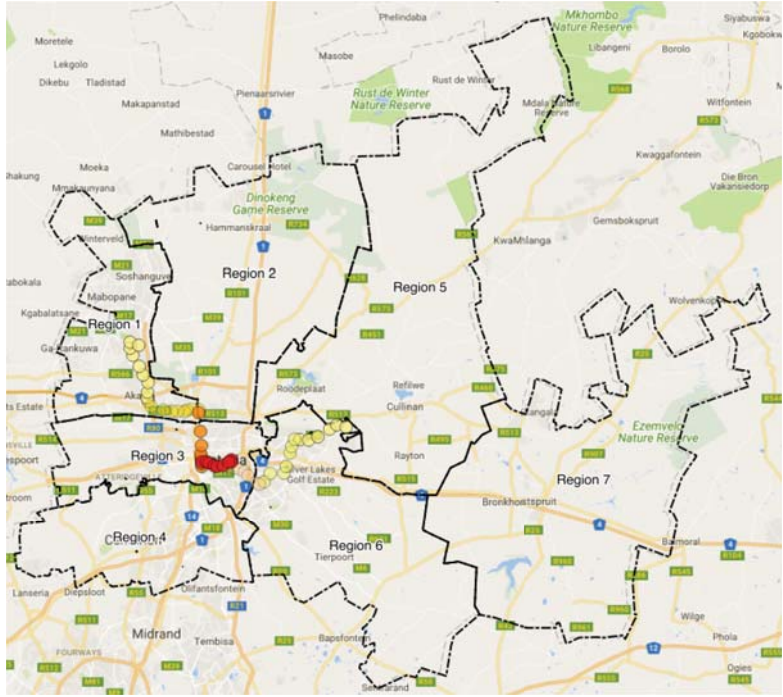
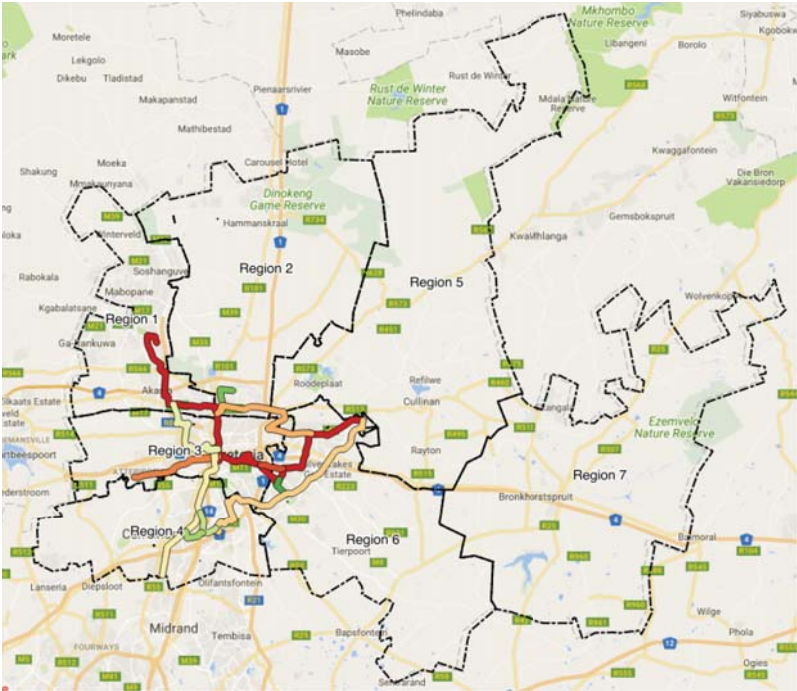
| Category | Description |
|-----------------------|---|
| | TOD shapefile. |
| Process | <p>The IRPTN TODs for the municipality is shown below. If a the spatial intersect returns more than one IRPTN TOD area intersecting with a project works location, then the maximum score between the intersects is passed to the parent branch.</p>  <p> ■ Phase 1a ToD ■ Phase 1b ToD ■ Phase 1c ToD ■ Phase 1d ToD ■ Phase 1e ToD ■ Phase 1f ToD </p> <p>Projects without works locations (i.e. city wide or administrative head quarter projects) receive a base score of 50.</p> |
| Mathematical Operator | Maximum value achieved by the project is passed through to the parent scoring branch. |

Table B-15: Public Transport – IRPTN Corridors

| Category | Description |
|---------------|--|
| Definition | Integrated Rapid Public Transport (IRPT) corridors have been defined in the Integrated Rapid Public Transport Network (IRPTN) plan in order to identify a hierarchy of investment priority areas towards densification and mixed-use investments along public transport routes. Numerous phases for the IRPT corridors have been identified based on the roll-out phasing of the IRPTN. Projects are scored based on their spatial intersect with the geographic priority areas. |
| Branch Weight | The different IRPTN corridor phases have been weighed differently based on the anticipated implementation phasing, therefore projects |

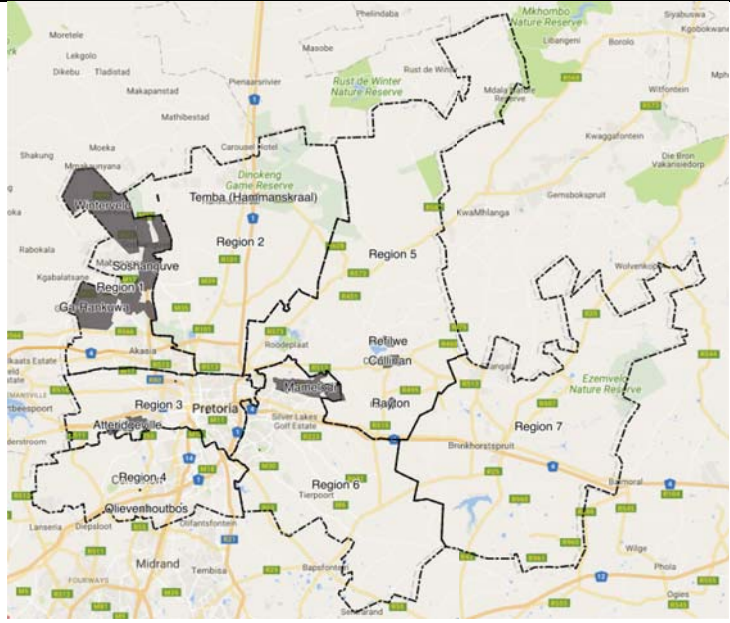
| Category | Description |
|-----------------|---|
| | <p>focussing on implementing projects along IRPTN corridors associated with early implementation phases of the IRPTN will receive elevated score. The following weighting applies:</p> <ul style="list-style-type: none"> • IRPTN Line 1 =100% • IRPTN Line 2 = 80% • IRPTN Line 4 = 60% • IRPTN Line 3 = 40% • IRPTN Line 5 = 20% • IRPTN Lines 6 - 11 = 10% |
| Input Variables | <p>Project works location is used as the input to test the geographic priority area score of each project based on the IRPTN Corridor shapefile provided by the municipality. A score is returned based on the spatial intersect between project works location and IRPTN Corridor shapefile.</p> |
| Process | <p>The IRPTN Corridor for the municipality is shown below. If a spatial intersect returns more than one IRPTN Corridor intersecting with a project works location, then the maximum score between the intersects is passed to the parent branch.</p>  <p>The map displays the IRPTN Corridors for the municipality of Midrand, South Africa. The corridors are color-coded according to their weighting, as shown in the legend below. The map includes various geographical features such as nature reserves (e.g., Mkhombo, Rust de Winter, Dinokeng, Ezemvelo), game reserves (e.g., Hammanstraal), and several regions (Region 1 through Region 7). Major roads and landmarks like Midrand, Sandton, and Fourways are also visible.</p> <ul style="list-style-type: none"> Line 01 Line 02 Line 03 Line 04 Line 05 Line 06 Line 07 Line 08 Line 09 Line 10 Line 11 |

| Category | Description |
|-----------------------|---|
| | Projects without works locations (i.e. city wide or administrative head quarter projects) receive a base score of 50. |
| Mathematical Operator | Maximum value achieved by the project is passed through to the parent scoring branch. |

B.2.4.3.2 Urban Cores

Table B-16: Urban Cores

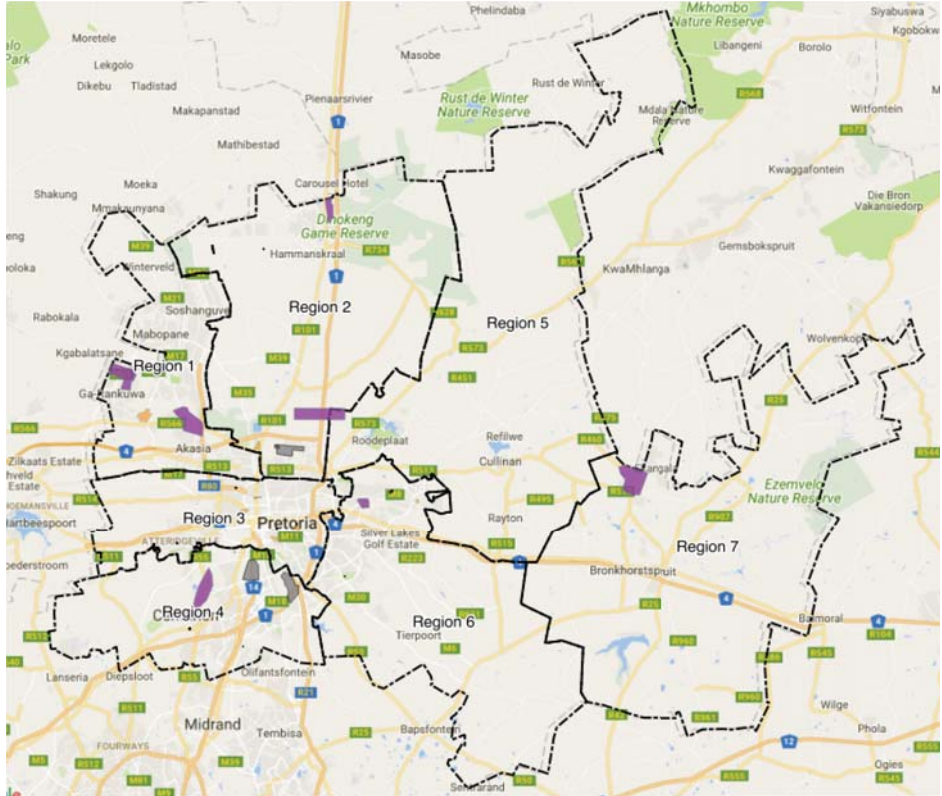
| Category | Description |
|-----------------|---|
| Definition | Urban Cores have been defined in the Built Environment Performance Plan (BEPP) in order to identify investment priority areas for capital investments to redress services and housing backlogs in underserved township areas. The Urban Core areas relate to the Underserved Township Areas of the National Treasury Urban Network Structure (UNS). Projects are scored based on their spatial intersect with the geographic priority areas. |
| Branch Weight | The Urban Cores have been weighed differently based on a development potential analysis undertaken during the Development Intervention Portfolios (DIPs) project during 2016. Therefore, projects focussing on implementing projects within Urban Cores with higher development potential will receive elevated score. The following weighting applies: <ul style="list-style-type: none"> • Mamelodi =100% • Soshanguve = 70% • Atteridgeville and Ga-Rankuwa = 57% • Olievenhoutbos = 43% • Winterveld = 38% • Refilwe = 30% • Cullinan, Rayton and Temba (Hammanskraal) = 24% |
| Input Variables | Project works location is used as the input to test the geographic priority area score of each project based on the Urban Core shapefile provided by the municipality. A score is returned based on the spatial intersect between project works location and Urban Core shapefile. |
| Process | The Urban Cores for the municipality is shown below. If a the spatial intersect returns more than one Urban Core intersecting with a project works location, then the maximum score between the intersects is passed to the parent branch. |

| Category | Description |
|-----------------------|---|
| |  <p>Urban Cores</p> <p>Projects without works locations (i.e. city wide or administrative head quarter projects) receive a base score of 50.</p> |
| Mathematical Operator | Maximum value achieved by the project is passed through to the parent scoring branch. |

B.2.4.3.3 MSDF Specialised Nodes

Table B-17: Specialised Nodes

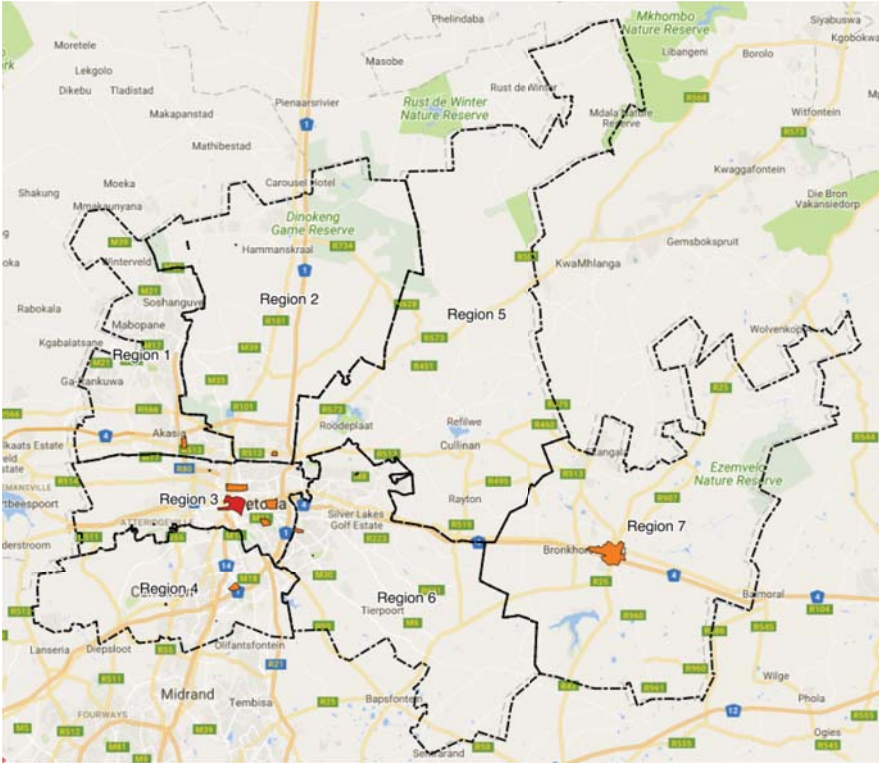
| Category | Description |
|-----------------|--|
| Definition | A number of Specialised Nodes have been defined in the Spatial Development Framework (SDF) in order to identify investment priority areas for capital investments around specialised activity precincts. Projects are scored based on their spatial intersect with these geographic priority areas. |
| Branch Weight | The specialised nodes have not been weighed differently. Therefore, all projects focussing on implementing projects within specialised nodes will receive elevated score. The following specialised nodes have been identified: <ul style="list-style-type: none"> • University Precincts (i.e. University Cities) • Airport Nodes • Industrial Nodes |
| Input Variables | Project works location is used as the input to test the geographic priority area score of each project based on the specialised node shapefiles provided by the municipality. A score is returned based on the spatial intersect between project works location and specialised node shapefiles. |
| Process | The specialised nodes for the municipality is shown below. If a the |

| Category | Description |
|-----------------------|--|
| | <p>spatial intersect returns more than one specialised node intersecting with a project works location, then the maximum score between the intersects is passed to the parent branch.</p>  <p>Projects without works locations (i.e. city wide or administrative head quarter projects) receive a base score of 50.</p> |
| Mathematical Operator | Maximum value achieved by the project is passed through to the parent scoring branch. |

B.2.4.3.4 MSDF Nodal Hierarchy

Table B-18: MSDF Nodal Hierarchy

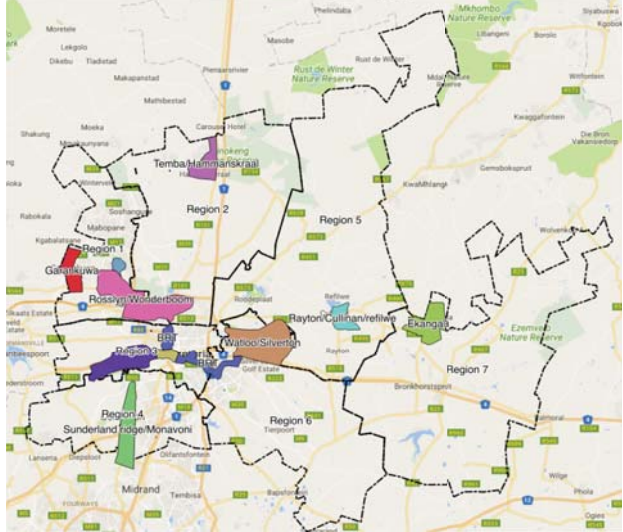
| Category | Description |
|---------------|---|
| Definition | A hierarchy of development nodes has been defined in the Spatial Development Framework (SDF) in order to identify investment priority areas for capital investments around mixed-use activity precincts. Projects are scored based on their spatial intersect with these geographic priority areas. |
| Branch Weight | The SDF nodal hierarchy has been weighed differently based on the importance or hierarchy of the nodes. Therefore, a project being implemented in a higher ranked nodal hierarchy area will receive a higher score than a project implementing in a lower hierarchy node. The following SDF nodes have been identified: |

| Category | Description |
|-----------------------|--|
| | <ul style="list-style-type: none"> • Capital Core = 100% • Metropolitan Nodes = 75% |
| Input Variables | <p>Project works location is used as the input to test the geographic priority area score of each project based on the SDF Nodal Hierarchy shapefiles provided by the municipality. A score is returned based on the spatial intersect between project works location and SDF Nodal Hierarchy shapefiles.</p> |
| Process | <p>The SDF Nodal Hierarchy for the municipality is shown below. If a the spatial intersect returns more than one SDF Nodal Hierarchy intersecting with a project works location, then the maximum score between the intersects is passed to the parent branch.</p>  <p> ■ Capital Core ■ SDF Metropolitan Nodes </p> <p>Projects without works locations (i.e. city wide or administrative head quarter projects) receive a base score of 50.</p> |
| Mathematical Operator | <p>Maximum value achieved by the project is passed through to the parent scoring branch.</p> |

B.2.4.3.5 BEPP Integration Zones

Table B-19: BEPP Integration Zones

| Category | Description |
|-----------------|--|
| Definition | <p>A hierarchy of Integration Zones has been defined in the Built Environment Performance Plan (BEPP) in order to identify investment priority areas for capital investments around key priority precincts. Integration Zones are spatial investment areas specified as part of the National Treasury Urban Network Structure (UNS). Projects are scored based on their spatial intersect with these geographic priority areas.</p> |
| Branch Weight | <p>The Integration Zones have not been weighed differently. Therefore, all projects focussing on implementing projects within Integration Zones will receive elevated score. Based on the Implementation of the outcomes of the Mayoral Strategic Planning Session, the following key areas has been identified:</p> <ul style="list-style-type: none"> • Targeted Spatial Economic Infrastructure Investment Areas <ul style="list-style-type: none"> • Rosslyn/Wonderboom Quadrant • Watloo/Silverton Quadrant • Sunderland ridge/Monavoni Quadrant • Targeted Spatial Social Infrastructure Investment Areas <ul style="list-style-type: none"> • Temba/Hammanskraal • Mabopane • Garankuwa |
| Input Variables | <p>Project works location is used as the input to test the geographic priority area score of each project based on the BEPP Integration Zones shapefile provided by the municipality. A score is returned based on the spatial intersect between project works location and BEPP Integration Zones shapefile.</p> |
| Process | <p>The BEPP Integration Zones for the municipality are shown below. If a the spatial intersect returns more than one BEPP Integration Zones shapefile intersecting with a project works location, then the maximum score between the intersects is passed to the parent branch.</p> |

| Category | Description |
|-----------------------|--|
| |  <p data-bbox="491 795 1401 875">Projects without works locations (i.e. city wide or administrative head quarter projects) receive a base score of 50.</p> |
| Mathematical Operator | Maximum value achieved by the project is passed through to the parent scoring branch. |

B.2.4.4 Financial Alignment

The financial alignment goal or theme of the prioritisation model evaluates the degree to which projects in the municipal capital budget are considered to be credible, affordable, funded, applied to expand the rateable asset base and improving the fiscal position of the municipality. The financial alignment score is calculated within four distinct categories, namely:

- Credibility
- Austerity
- Increased Rates Base
- Fiscal Deficit as a % of GDP

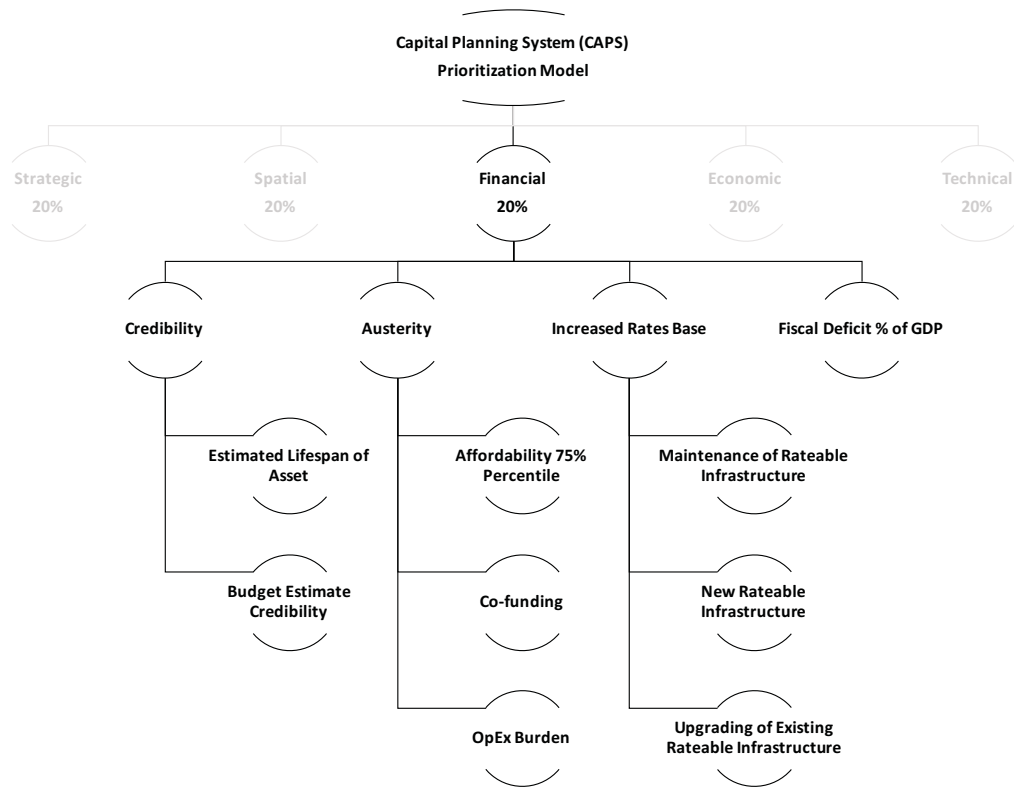


Figure B-57: Financial Alignment

B.2.4.4.1 Credibility

Table B-20: Lifespan of Asset

| Category | Description |
|-----------------|---|
| Definition | <p>A fundamental element of responsible financial planning is to consider the lifespan of the asset that will be procured should the specific capital request be approved. The longevity of the asset is something that gets considered in the process of calculating more sophisticated financial indicators such as the return on investment, the net present value, and so on.</p> <p>The diversity of capital requests within a public-sector environment is however of such a nature that the required data to perform such calculations is not readily available for the majority of projects. More rudimentary proxy criteria therefore had to be sought that would provide similar assurances from a financial perspective.</p> <p>Project owners are required to provide an estimate of the lifespan of the asset for which capital is requested, from the following options:</p> <ul style="list-style-type: none"> a. 0-2 years b. 3-10 years c. 11-20 years <li style="background-color: #006400; color: white;">✓ d. >20 years e. Not applicable |
| Branch Weight | 50% |
| Input Variables | The input variables are taken directly from the value chosen by the project owner from the following list: |

| Category | Description | | | | | | | | | | | | |
|-----------------------|--|--|-------|----------------|--|-----------------|--|------------------|--|---------------|---|-------------------|---|
| | <ul style="list-style-type: none"> a. 0-2 years b. 3-10 years c. 11-20 years <input checked="" type="checkbox"/> d. >20 years e. Not applicable | | | | | | | | | | | | |
| Process | <p>The scoring mechanism takes the form of a stepping function with each option carrying a representative score.</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center; font-size: small;">Score</th> </tr> </thead> <tbody> <tr> <td>a. 0 - 2 years</td> <td style="text-align: center;">40</td> </tr> <tr> <td>b. 3 - 10 years</td> <td style="text-align: center;">60</td> </tr> <tr> <td>c. 11 - 20 years</td> <td style="text-align: center;">80</td> </tr> <tr> <td>d. > 20 years</td> <td style="text-align: center;">100</td> </tr> <tr> <td>e. Not applicable</td> <td style="text-align: center;">0</td> </tr> </tbody> </table> | | Score | a. 0 - 2 years | 40 | b. 3 - 10 years | 60 | c. 11 - 20 years | 80 | d. > 20 years | 100 | e. Not applicable | 0 |
| | Score | | | | | | | | | | | | |
| a. 0 - 2 years | 40 | | | | | | | | | | | | |
| b. 3 - 10 years | 60 | | | | | | | | | | | | |
| c. 11 - 20 years | 80 | | | | | | | | | | | | |
| d. > 20 years | 100 | | | | | | | | | | | | |
| e. Not applicable | 0 | | | | | | | | | | | | |
| Mathematical Operator | Ranked value achieved by the project is passed through to the parent scoring branch. | | | | | | | | | | | | |

Table B-21: Budget Estimate Credibility

| Category | Description | | | | | | | | | | | | | | |
|------------------------|---|--|-------|----------------------|---|----------------------|--|------------------------|--|------------------------|--|------------------------|--|----------------------|---|
| Definition | <p>The “Credibility” of the budget that is being asked for, is measured in by testing the credibility or accuracy of the cost estimate as well as the estimated lifespan of the asset for which funding is requested. The scale provided for the evaluation of budget estimate accuracy, is the scale provided by National Treasury in terms of their CIDMS guidelines. Better accuracy is awarded as well as a longer estimated lifespan of the asset under evaluation.</p> <p>The project owner needs to indicate the accuracy of the budget estimate based on the following scale:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> a. Class 1 (-3% to 3%) b. Class 2 (-5% to 5%) c. Class 3 (-10% to 10%) d. Class 4 (-15% to 20%) e. Class 5 (-20% to 30%) f. Quotation / Tender | | | | | | | | | | | | | | |
| Branch Weight | 50% | | | | | | | | | | | | | | |
| Input Variables | <p>The input variables are taken from the predetermined drop-down list representing the National Treasury prescribed ranges as contained in their CIDMS guidelines.</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> a. Class 1 (-3% to 3%) b. Class 2 (-5% to 5%) c. Class 3 (-10% to 10%) d. Class 4 (-15% to 20%) e. Class 5 (-20% to 30%) f. Quotation / Tender | | | | | | | | | | | | | | |
| Process | <p>The scoring mechanism takes the form of a stepping function with each option carrying a representative score.</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center; font-size: small;">Score</th> </tr> </thead> <tbody> <tr> <td>• Class 1 (-3% ↔ 3%)</td> <td style="text-align: center;">100</td> </tr> <tr> <td>• Class 2 (-5% ↔ 5%)</td> <td style="text-align: center;">90</td> </tr> <tr> <td>• Class 3 (-10% ↔ 10%)</td> <td style="text-align: center;">80</td> </tr> <tr> <td>• Class 4 (-15% ↔ 20%)</td> <td style="text-align: center;">65</td> </tr> <tr> <td>• Class 5 (-20% ↔ 30%)</td> <td style="text-align: center;">50</td> </tr> <tr> <td>• Quotation / Tender</td> <td style="text-align: center;">100</td> </tr> </tbody> </table> | | Score | • Class 1 (-3% ↔ 3%) | 100 | • Class 2 (-5% ↔ 5%) | 90 | • Class 3 (-10% ↔ 10%) | 80 | • Class 4 (-15% ↔ 20%) | 65 | • Class 5 (-20% ↔ 30%) | 50 | • Quotation / Tender | 100 |
| | Score | | | | | | | | | | | | | | |
| • Class 1 (-3% ↔ 3%) | 100 | | | | | | | | | | | | | | |
| • Class 2 (-5% ↔ 5%) | 90 | | | | | | | | | | | | | | |
| • Class 3 (-10% ↔ 10%) | 80 | | | | | | | | | | | | | | |
| • Class 4 (-15% ↔ 20%) | 65 | | | | | | | | | | | | | | |
| • Class 5 (-20% ↔ 30%) | 50 | | | | | | | | | | | | | | |
| • Quotation / Tender | 100 | | | | | | | | | | | | | | |

| Category | Description |
|-----------------------|--|
| Mathematical Operator | Ranked value achieved by the project is passed through to the parent scoring branch. |

B.2.4.4.2 Austerity

Table B-22: Affordability

| Category | Description |
|------------|--|
| Definition | <p>With “Affordability”, all the project budget demands summed over the MTREF period is plotted from smallest to largest. The 75th percentile value is calculated across this range of values. This value is used as an approximation of what may be considered as the turning point in the budget range beyond which project can be considered to become increasingly expensive. The term “expensive” is used with great circumspection and should not be used beyond the context of this model. It simply is an indicator representative of the specific range of budget values that were requested over the MTREF for this specific budget cycle.</p> <p>Projects that are “cheaper” than the 75th percentile does not have a great variance in requested budgets and can all be drawn in a relatively flat curve on a graph as shown on the graph below. Projects that are more expensive than the 75th percentile, increases in budget exponentially and rapidly has the “crowding out” effect. “Crowding out” means that a single “expensive” project budget may “crowd out” numerous smaller project budgets. In terms of service delivery, having more projects visibly being implemented often has a greater impact than one “mega project”. There are of course many exceptions to this assumption. This criterion simply penalises – from a purely financial budgeting perspective – projects that are excessively expensive.</p> <p>It must be kept in mind that this is simply one criteria out of many in the model, and does not have an overriding effect. Contextually though, when looking at the financial planning aspects of a municipality purely, without consideration of anything else, the “expensiveness” of a project is a fundamental consideration.</p> |

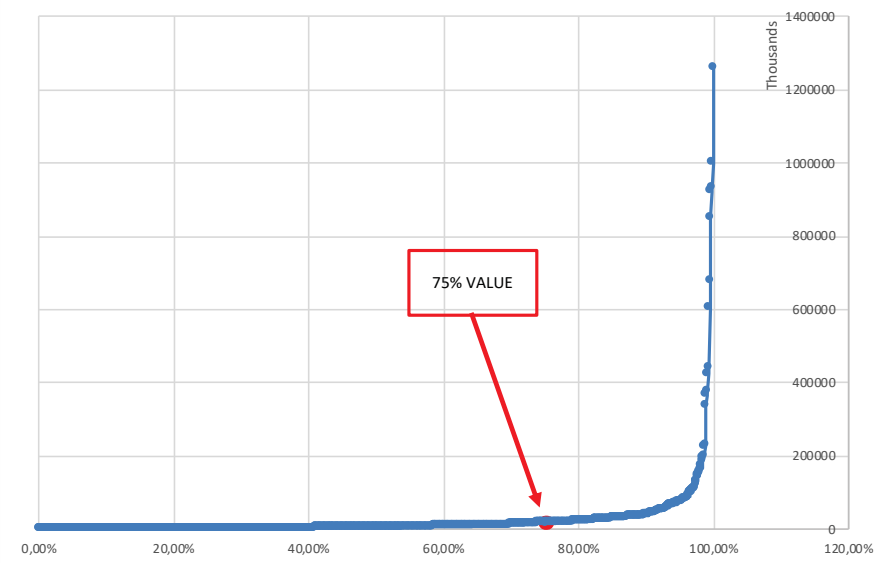
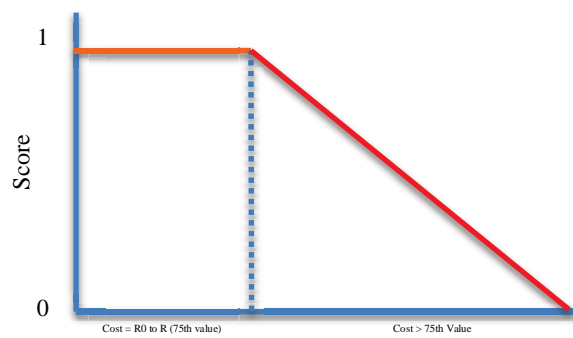
| Category | Description |
|-----------------------|--|
| | <p style="text-align: center;">MTREF BUDGET</p>  |
| Branch Weight | 60% |
| Input Variables | The input values for this criterion is the total capital budget requested over the MTREF, the 75 th percentile of all capital budget requests over the MTREF and the maximum capital budget request over the MTREF. |
| Process |  $y = \left(\frac{1}{75th - Maximum} \right) x - \left(\frac{1}{75th - Maximum} \right) Maximum$ <p>Score = 100 if calculated value ≤ 75th percentile of MTREF The score decays from 100 to zero using linear regression for any MTREF budget that is more expensive than the 75th percentile MTREF budget (over the entire range of budgets for all projects).</p> |
| Mathematical Operator | Calculated value achieved by the project is passed through to the parent scoring branch. |

Table B-23: Co-funding

| Category | Description |
|-----------------------|---|
| Definition | <p>The “Co-Funding” criterion appraises how much of the requested capital is funded by sources other than the council’s own funds. The more co-funding by other sources, the more the project will score under this criterion. The logic behind this is two-fold. Firstly, the more external funding is used, the lesser is the burden on council’s own ability to fund the project. Secondly, some of the co-funding sources within a municipal environment is conditional and there are often time-limitations or conditions to these external sources.</p> <p>Therefore, if the funding is not utilised, the opportunity or availability of the funding expires or lapses. From a budgeting and planning perspective, a project that may be slightly lower down the ranks of priorities, but that has other sources of funding, may be prioritised more in order to gain the benefit from its implementation and the availability of funding to do so.</p> |
| Branch Weight | 20% |
| Input Variables | The input values for this criterion is the total capital budget requested over the MTREF and the percentage of co-funding over the MTREF. |
| Process | <div data-bbox="539 1048 1002 1344" data-label="Figure"> </div> $y = \frac{x}{Maximum}$ <p>A maximum score of 100 is achieved under this criterion of the project is 100% co-funded by other sources. The more co-funding, the better the score here.</p> |
| Mathematical Operator | Calculated value achieved by the project is passed through to the parent scoring branch. |

Table B-24: Operational expenditure as % of GDP

| Category | Description |
|-----------------|--|
| Definition | <p>The 'operational expenditure to GDP'-indicator measures the impact of the project/programme/portfolio of projects on the operational expenditure of the City/Province, which include the wage bill impact of the project(s).</p> <p>Again, the indicator number will be very small, and also need to be interpreted as the % increase (if positive) in government expenditure relative to the project's income gains.</p> <p>The indicator is expressed in terms of a R'000 (thousand rand) increase in operational expenditure for every R1mn change in GDP associated with the project(s). Therefore, a number of 0.00002 need to be interpreted as a R20000 increase in operational expenditure per R1mn project income (GDP gains). In the case of a R50 mil additional GDP, the operational expenditure is expected to increase with R100 000.</p> <p>However, this number need to be interpreted along with the previous fiscal-indicator. The fiscal indicator ALREADY incorporates the changes in operational expenditure. Therefore, in the case where the fiscal deficit-indicator is positive (i.e. a decline in deficit), while the operational indicator is also positive (i.e. increase in expenses), the implication is that the income and potential revenue gains for the City/Province is larger than the increased and associated operational expense.</p> <p>This indicator is therefore valuable in (1) planning with respect to operational expenditure, (2) making the business case for high-impact investment projects, which over time (maturity) generate sufficient income to cover the associated increased operational expenditure, and (3) compare project(s) with respect to their relative impact on the City's (Province's) financial position.</p> |
| Branch Weight | 20% |
| Input Variables | Economic Impact Model Outputs |
| Process | It is not necessary to normalise this indicator as is the case with the other Economic Impact Model indicators. The indicator value is already reflected as a percentage of GDP. The values for the database is normally ranked as depicted below. |

| Category | Description |
|-----------------------|---|
| | <p>The graph displays a series of ranked values for 'Operational Expenditure As % of GDP'. The y-axis ranges from 0 to 400 in increments of 50. The x-axis represents ranks from 1 to 350. The data points are connected by a blue line that shows a consistent downward trend, starting at approximately 350% for rank 1 and ending near 0% for rank 350. There are several small horizontal plateaus or steps in the line, indicating that multiple projects share the same expenditure percentage for certain ranks.</p> |
| Mathematical Operator | Ranked value achieved by the project is passed through to the parent scoring branch. |

B.2.4.4.3 Increased Rates Base

Table B-25: Increase in Rates Base

| Category | Description |
|-----------------|---|
| Definition | <p>The “Increase in rates base” evaluates whether a project’s implementation will contribute towards rates and taxes directly or not. From a purely financial perspective, if a project’s implementation will directly lead to increased rates and taxes that would be collected by the municipality, this will be beneficial.</p> <p>In order to determine whether a project will contribute to rates and taxes, it has to be ascertained whether the project represents a service (e.g. the provision of electricity) that can be levied from the end-user. Here, the benefit of the data that can be harvested from the MSCOA classification process is evident. The MSCOA classification assists to determine whether the funding applied for is for new infrastructure or for the upgrading of existing infrastructure in order to improve capacities.</p> |
| Branch Weight | 20% |
| Input Variables | <p>A two-tier test is applied to determine to what extent the existing rates base or asset base is protected and expanded. The first test which is applied is based on the MSCOA project action and sub-action relating to the MSCOA Project Segment.</p> <p>The following categories are tested:</p> |

| Category | Description |
|-----------------------|---|
| | <ul style="list-style-type: none"> • New rateable infrastructure: MSCOA project action = “New” • Upgrading of existing rateable infrastructure: MSCOA project sub-action = “Upgrading” • Maintenance of rateable infrastructure: MSCOA project sub-action = “Renewal” <p>The following category weights are applied:</p> <ul style="list-style-type: none"> • New rateable infrastructure = 100 • Upgrading of existing rateable infrastructure = 75 • Maintenance of rateable infrastructure = 50 <p>Once the projects have been pre-filtered for new, upgrading or renewal actions, a second test is performed to ascertain whether the project is from one of the following departments:</p> <ul style="list-style-type: none"> • Energy • Water • Sanitation |
| Process | <p>If a project is requesting capital and it emanates from one of the departments that provides infrastructure that directly leads towards an increase in the rates and taxes that can be collected, the project will score fully under this criterion.</p> |
| Mathematical Operator | <p>Scored value achieved by the project is passed through to the parent scoring branch.</p> |

B.2.4.4.4 Fiscal Deficit % of GDP

Table B-26: Fiscal deficit as % of GDP

| Category | Description |
|-----------------|---|
| Definition | <p>The 'fiscal deficit to GDP ratio'-indicator measures changes in the deficit position of the City/Province relative to changes in economic activity, which again is a result of the project/programme/portfolio of projects. The indicator number will always be very small, but need to be interpreted as the % improvement (if positive) or deterioration (if negative) of the deficit relative to GDP.</p> <p>The indicator is expressed as the change in fiscal deficit position (measured in terms of R'000) for every R1mn change in GDP.</p> <p>Example: a number of 0.00001 need to be interpreted as a R10000 improvement in the fiscal position, i.e. a R10000 decline in the deficit of the City/Province per R1mn GDP gains. Therefore, in the case where a project results in R50 mil additional GDP, the deficit should decline with R500 000.</p> <p>However, the primary value of the fiscal indicator is (1) to determine whether the project/programme will have a POSITIVE impact on the fiscal position, i.e. result in a decline in the deficit, and (2) to compare various projects in terms of their impact on the City's (Province's) financial position.</p> |
| Branch Weight | 20% |
| Input Variables | Economic Impact Model Outputs |
| Process | <p>The indicator calculated by the EIM is normalised by multiplying the calculated EIM value (percentage points) with a common denominator namely a million. This normalises the indicator to Rand per R1mil GDP increase. The last step in the process is to rank the actual outcomes linearly from most positive to least positive. This results in the typical graph shown below.</p> |

| Category | Description |
|-----------------------|--|
| Mathematical Operator | Ranked value achieved by the project is passed through to the parent scoring branch. |

B.2.4.5 Economic Alignment

The economic alignment goal or theme of the prioritisation model evaluates the degree to which projects in the municipal capital budget contributes to the growth of the municipal economy and improves the economic position of the residents within the municipality.

A macro-economic impact model (EIM) was developed for the municipality specifically to make use of the data from the CAPS system. The econometric model is specific for the municipality and draws from a sophisticated range of financial data, regional data, and population data sourced from STATSSA. As such, the EIM generates values for the impact of individual and portfolio capital projects in terms of a set of economic, socio-economic and fiscal indicators – for the City as a whole, as well as a selection of key sub-regions or ‘main places’.

The EIM is based on the outputs of a comprehensive suite of econometric models. The workings of the EIM are dynamic and consider the indirect City-wide impacts of projects and programmes – not only the localised ward-specific impact.

The EIM therefore captures the iterative, dynamic impacts of all of the role-players within the economy – households, business, government, foreign sector, as well as the full economic flow of goods, services, factors and money is accounted for, and an iterative computational process is utilised.

The outputs from the economic model is further augmented spatially by evaluating the alignment of the project’s location and affected area, with geographic areas that were graded across the entire municipal area in terms of its economic impact in a separate economic study that was conducted for this purpose.

The economic alignment score is calculated within two distinct categories, namely:

- Focus on impact
- Focus on people

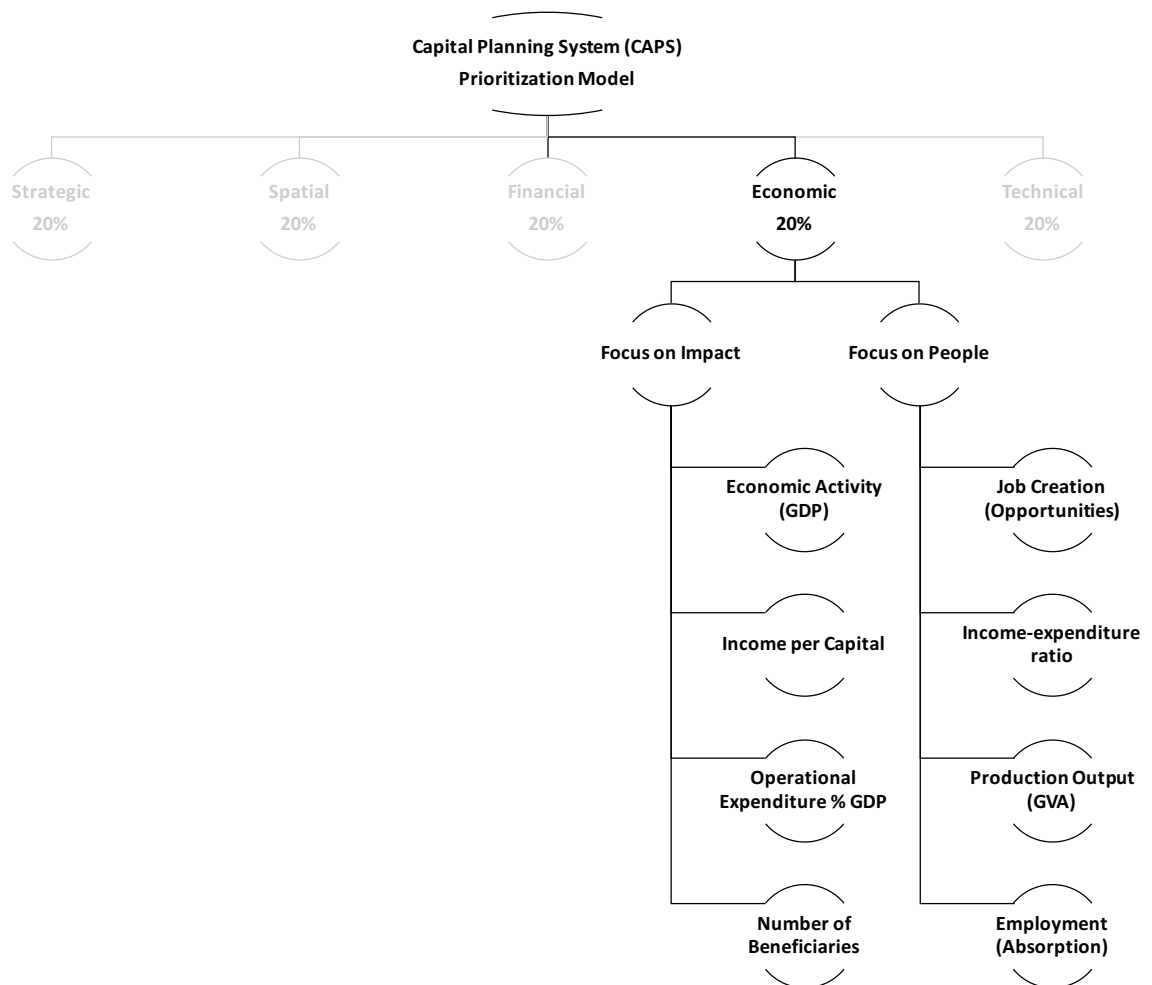


Figure B-58: Economic Alignment

B.2.4.5.1 Focus on Impact

Table B-27: Economic Activity (Income) in terms of Gross Domestic Product (GDP)

| Category | Description |
|------------|--|
| Definition | <p>GDP measures/represents the value of economic activity (income) that has been generated across ALL industries as a result of the project/programme/portfolio of projects. It takes into account the value of taxes and subsidies on both production and consumption goods/services. As such, the GDP figure is presented at 'market price' value. It is measured in nominal Rand, i.e. at current prices. The number represents the TOTAL, NET impact of the project, i.e. taking into account the 'winners' and 'losers' in the economy; the benefits and costs associated with the project.</p> <p>The number is not 'time'-bound, in the sense that the GDP figure represents the full impact, once the project investment/spending has had time to 'mature', i.e. the investment/spending impact has filtered ('rippled') through the economy and the feedback have stabilised. As such, the number is an indicating of the net POTENTIAL income impact of the project/programme, assuming no other interventions/interruptions, etc.</p> |

| Category | Description |
|-----------------------|--|
| | The GDP indicator is valuable in comparing the relative impact of different projects/programmes or portfolios of projects, in terms of the additional economic activity that they 'unlock' for every Rand invested and/or spent over the project implementation time-line. The GDP-indicator also provides a measure of the 'net tax revenue' available to government, but also the 'net tax burden' on producers and consumers. |
| Branch Weight | 25% |
| Input Variables | Economic Impact Model Outputs |
| Process | <p>The indicator calculated by the EIM is normalised by dividing the calculated EIM value with a common denominator namely the capital requested over the MTREF. This is done as a necessary step to establish comparability between projects and wards. The last step in the process is to rank the actual outcomes linearly from most positive to least positive. This results in the typical graph shown below.</p> |
| Mathematical Operator | Ranked value achieved by the project is passed through to the parent scoring branch. |

Table B-28: Income per capita

| Category | Description |
|-----------------|---|
| Definition | The "Income per Capita" indicator measures the Rand value of income (through GDP) per member of the population. It links the changes in economic activity (on the back of 'matured' implementation of the project spending on the GDP to household income and therefore presents a measure for income distribution as well as the effectiveness of the project in achieving socio-economic gains. |
| Branch Weight | 25% |
| Input Variables | Economic Impact Model Outputs |
| Process | The indicator calculated by the EIM is normalised by dividing the calculated EIM value with a common denominator namely the capital |

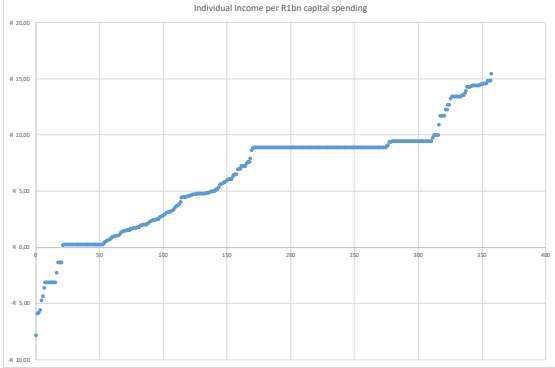
| Category | Description |
|-----------------------|--|
| | <p>requested over the MTREF. This normalises the indicator to Rand per R1bn capital spending. The last step in the process is to rank the actual outcomes linearly from most positive to least positive. This results in the typical graph shown below.</p>  |
| Mathematical Operator | Ranked value achieved by the project is passed through to the parent scoring branch. |

Table B-29: Austerity: Operational expenditure as percentage of GDP

| Category | Description |
|------------|--|
| Definition | <p>The 'operational expenditure to GDP'-indicator measures the impact of the project/programme/portfolio of projects on the operational expenditure of the City/Province, which include the wage bill impact of the project(s).</p> <p>Again, the indicator number will be very small, and also need to be interpreted as the % increase (if positive) in government expenditure relative to the project's income gains.</p> <p>The indicator is expressed in terms of a R'000 (thousand rand) increase in operational expenditure for every R1mn change in GDP associated with the project(s). Therefore, a number of 0.00002 need to be interpreted as a R20000 increase in operational expenditure per R1mn project income (GDP gains). In the case of a R50 mil additional GDP, the operational expenditure is expected to increase with R100 000.</p> <p>However, this number need to be interpreted along with the previous fiscal-indicator. The fiscal indicator ALREADY incorporates the changes in operational expenditure. Therefore, in the case where the fiscal deficit-indicator is positive (i.e. a decline in deficit), while the operational indicator is also positive (i.e. increase in expenses), the implication is that the income and potential revenue gains for the City/Province is larger than the increased and associated operational expense.</p> <p>This indicator is therefore valuable in (1) planning with respect to operational expenditure, (2) making the business case for high-impact investment projects, which over time (maturity) generate sufficient income to cover the associated increased operational expenditure, and (3) compare project(s) with respect to their relative</p> |

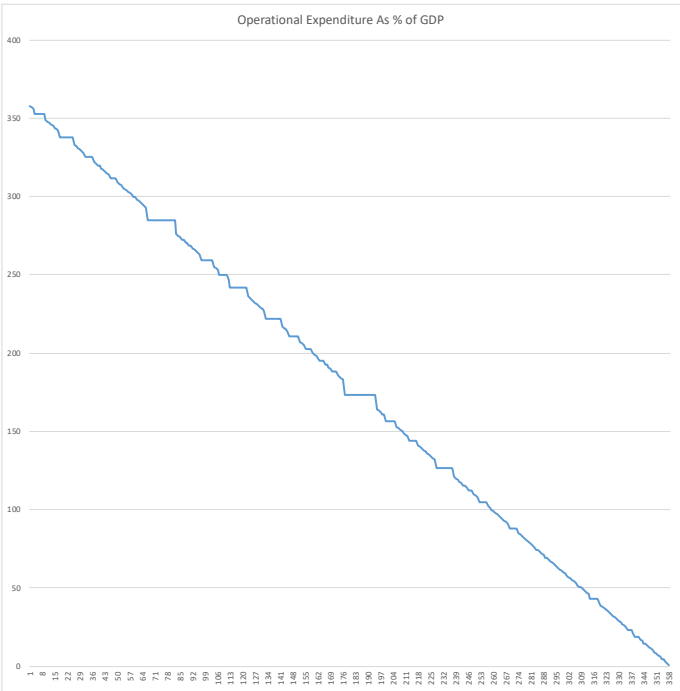
| Category | Description |
|-----------------------|---|
| | impact on the City's (Province's) financial position. |
| Branch Weight | 34% |
| Input Variables | Economic Impact Model Outputs |
| Process | <p>It is not necessary to normalise this indicator as is the case with the other Economic Impact Model indicators. The indicator value is already reflected as a percentage of GDP. The values for the database is normally ranked as depicted below.</p>  <p>The graph shows a series of data points connected by a blue line, representing the ranking of operational expenditure as a percentage of GDP. The y-axis ranges from 0 to 400 in increments of 50. The x-axis represents ranks from 1 to 325. The line starts at approximately 350% for rank 1 and generally decreases, with some fluctuations, reaching 0% at rank 325.</p> |
| Mathematical Operator | Ranked value achieved by the project is passed through to the parent scoring branch. |

Table B-30: Number of Beneficiaries

| Category | Description |
|-----------------|---|
| Definition | The spatial analysis capability of the CAPS system, in combination with the affected area that is drawn for each project, is used to automatically deduct the number of beneficiaries that will be impacted or benefitted by the project. From an economic perspective, the more people that are affected by an investment, the larger the impact should be on the economy. |
| Branch Weight | 33% |
| Input Variables | Project affected area |
| Process | The number of beneficiaries of the Statistics South Africa Census 2011 is loaded onto the CAPS system at small area level. The proportional spatial intersect of the project's affected area and the Census 2011 small area layer is calculated. The sum of the population in the intersected Census 2011 small area layer is divided by the maximum population affected by |

| Category | Description | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------|---|-----------------|--------------------|-----------------|---------------|-----------|----------------|---------------|--------------|------------|-------|-------|---------|----------------------|-------|-------|---------|------------|------|------|--------|---------------|------|------|--------|-------------|----|----|-------|
| | <p>any project in the CAPS database in order to create a beneficiary population index. Projects are therefore ranked from highest number of beneficiaries impacted to the lowest number of beneficiaries impacted. The above calculation is expressed by the following mathematical equation:</p> $Y = (x / \text{Max Affected Area Population}) * 100$ <p>This project impact is also provided per project on the CAPS Project Impact screen (shown below).</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #e0e0e0;">Spatial Impact</th> <th style="background-color: #e0e0e0; border-bottom: 2px solid green;">Beneficiary Impact</th> <th style="background-color: #e0e0e0;">Economic Impact</th> <th style="background-color: #e0e0e0;">Project Score</th> </tr> </thead> <tbody> <tr> <td style="background-color: #e0e0e0;">Indicator</td> <td style="background-color: #e0e0e0;">Works Location</td> <td style="background-color: #e0e0e0;">Affected Area</td> <td style="background-color: #e0e0e0;">Municipality</td> </tr> <tr> <td style="background-color: #e0e0e0;">Population</td> <td style="background-color: #e0e0e0;">37435</td> <td style="background-color: #e0e0e0;">33356</td> <td style="background-color: #e0e0e0;">3178239</td> </tr> <tr> <td style="background-color: #e0e0e0;">Number of Households</td> <td style="background-color: #e0e0e0;">13842</td> <td style="background-color: #e0e0e0;">10397</td> <td style="background-color: #e0e0e0;">1011351</td> </tr> <tr> <td style="background-color: #e0e0e0;">Low income</td> <td style="background-color: #e0e0e0;">6360</td> <td style="background-color: #e0e0e0;">4794</td> <td style="background-color: #e0e0e0;">390738</td> </tr> <tr> <td style="background-color: #e0e0e0;">Middle income</td> <td style="background-color: #e0e0e0;">7458</td> <td style="background-color: #e0e0e0;">5587</td> <td style="background-color: #e0e0e0;">586809</td> </tr> <tr> <td style="background-color: #e0e0e0;">High income</td> <td style="background-color: #e0e0e0; border-bottom: 2px solid green;">24</td> <td style="background-color: #e0e0e0; border-bottom: 2px solid green;">15</td> <td style="background-color: #e0e0e0; border-bottom: 2px solid green;">37293</td> </tr> </tbody> </table> <p>Projects without works locations (i.e. city wide or administrative head quarter projects) receive a base score of 50.</p> | Spatial Impact | Beneficiary Impact | Economic Impact | Project Score | Indicator | Works Location | Affected Area | Municipality | Population | 37435 | 33356 | 3178239 | Number of Households | 13842 | 10397 | 1011351 | Low income | 6360 | 4794 | 390738 | Middle income | 7458 | 5587 | 586809 | High income | 24 | 15 | 37293 |
| Spatial Impact | Beneficiary Impact | Economic Impact | Project Score | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Indicator | Works Location | Affected Area | Municipality | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Population | 37435 | 33356 | 3178239 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Number of Households | 13842 | 10397 | 1011351 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Low income | 6360 | 4794 | 390738 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Middle income | 7458 | 5587 | 586809 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| High income | 24 | 15 | 37293 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mathematical Operator | Maximum value achieved by the project is passed through to the parent scoring branch. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

B.2.4.5.2 Focus on People

Table B-31: Job Creation (Opportunities)

| Category | Description |
|-----------------|--|
| Definition | The “Job Creation” indicator represents the number of people that may become employed across all industries as a result of the project. It distinguishes between “job-opportunities” and “job-absorption” – these are distinctly different. Job opportunities measures the total number of potential jobs that may be generated across all industries on the back of matured implementation. Job absorption is the number of jobs that may be occupied across all industries. The job absorption figure adjusts (lowers) the job opportunities figure for structural unemployment, i.e. the percentage of the labour force that are unemployable for reasons of lack of skills, socio-economic impediments, etc. |
| Branch Weight | 25% |
| Input Variables | Economic Impact Model Outputs |
| Process | The indicator calculated by the EIM is normalised by dividing the calculated EIM value with a common denominator namely the capital requested over the MTREF. This is done as a necessary step to establish comparability between projects and wards. The result is presented as jobs created per R1m capital spent. The last step in the process is to rank the actual outcomes linearly from most positive to least positive. This results in the typical graph shown below. |

| Category | Description |
|-----------------------|--|
| | |
| Mathematical Operator | Ranked value achieved by the project is passed through to the parent scoring branch. |

Table B-32: Income-expenditure ratio

| Category | Description |
|-----------------|---|
| Definition | The “Income to expenditure ratio” indicator is an indicator of surplus income of potential savings per household. This is a direct “wealth measure”. It expresses the potential income gains relative to the higher spending behaviour on the back of changes in economic activity. This indicator therefore measures the impact/effectiveness of the investment/spending portfolio in increasing households’ propensity to save. As such, the indicator is also a measure of ‘wealth’ improvement associated with the project. |
| Branch Weight | 25% |
| Input Variables | Economic Impact Model Outputs |
| Process | The indicator calculated by the EIM is normalised by multiplying the calculated EIM value with a common denominator namely the GDP value. This normalises the indicator to Rand per R1bn GDP increase. The last step in the process is to rank the actual outcomes linearly from most positive to least positive. This results in the typical graph shown below. |

| Category | Description |
|-----------------------|--|
| | |
| Mathematical Operator | Ranked value achieved by the project is passed through to the parent scoring branch. |

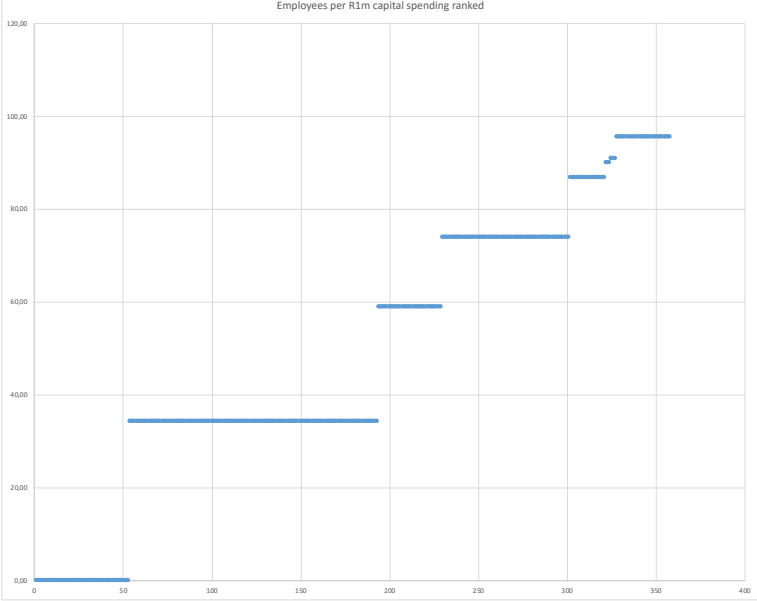
Table B-33: Production Output – Gross Value Addition (GVA)

| Category | Description |
|-----------------|---|
| Definition | <p>Gross Value Addition (GVA) measures/represents the value of economic activity (income) that has been generated across ALL industries as a result of the project/programme/portfolio of projects. It does not take into account the value of taxes and subsidies on both production and consumption goods/services. As such, the GVA figure is presented at 'market price' value. It is measured in nominal Rand, i.e. at current prices.</p> <p>The number represents the TOTAL, NET impact of the project, i.e. taking into account the 'winners' and 'losers' in the economy; the benefits and costs associated with the project.</p> <p>The number is not 'time'-bound, in the sense that the GVA figure represents the full impact, once the project investment/spending has had time to 'mature', i.e. the investment/spending impact has filtered ('rippled') through the economy and the feedback have stabilised. As such, the number is an indicating of the net POTENTIAL income impact of the project/programme, assuming no other interventions/interruptions, etc.</p> <p>The GVA indicator is valuable in comparing the relative impact of different projects/programmes or portfolios of projects, in terms of the additional economic activity that they 'unlock' for every Rand invested and/or spent over the project implementation time-line.</p> |
| Branch Weight | 30% |
| Input Variables | Economic Impact Model Outputs |
| Process | The indicator calculated by the EIM is normalised by dividing the calculated EIM value with a common denominator namely the capital requested over the MTREF. This is done as a necessary step to establish comparability between projects and wards. The last step in the process is to rank the actual outcomes linearly from most positive to least positive. This results in the typical graph shown |

| Category | Description |
|-----------------------|--|
| | <p>below.</p> |
| Mathematical Operator | Ranked value achieved by the project is passed through to the parent scoring branch. |

Table B-34: Employment (Job Absorption)

| Category | Description |
|-----------------|---|
| Definition | The “Employment” indicator represents the number of people that are likely to be absorbed by the economy across all industries as a result of the project. Job opportunities measures the total number of potential jobs that may be generated across all industries on the back of matured implementation. Job absorption is the number of jobs that may be occupied across all industries. The job absorption figure adjusts (lowers) the job opportunities figure for structural unemployment, i.e. the percentage of the labour force that are unemployable for reasons of lack of skills, socio-economic impediments, etc. |
| Branch Weight | 25% |
| Input Variables | Economic Impact Model Outputs |
| Process | The indicator calculated by the EIM is normalised by dividing the calculated EIM value with a common denominator namely the capital requested over the MTREF. This is done as a necessary step to establish comparability between projects and wards. The result is presented as employment opportunities per R1m capital spent. The last step in the process is to rank the actual outcomes linearly from most positive to least positive. This results in the typical graph shown below. |

| Category | Description |
|-----------------------|--|
| |  |
| Mathematical Operator | Ranked value achieved by the project is passed through to the parent scoring branch. |

B.2.4.6 Technical Alignment

The technical alignment goal or theme of the prioritisation model evaluates the degree to which projects in the municipal capital budget aligns with the asset management plans, analysis and modelling of the technical or utility services departments as well as the sustainability goals of the municipality, and most importantly, whether the project is ready to be implemented (i.e. all statutory and governance requirements have been met).

The technical alignment score is calculated within three distinct categories, namely:

- Implementation readiness
- Departmental rating
- Sustainability

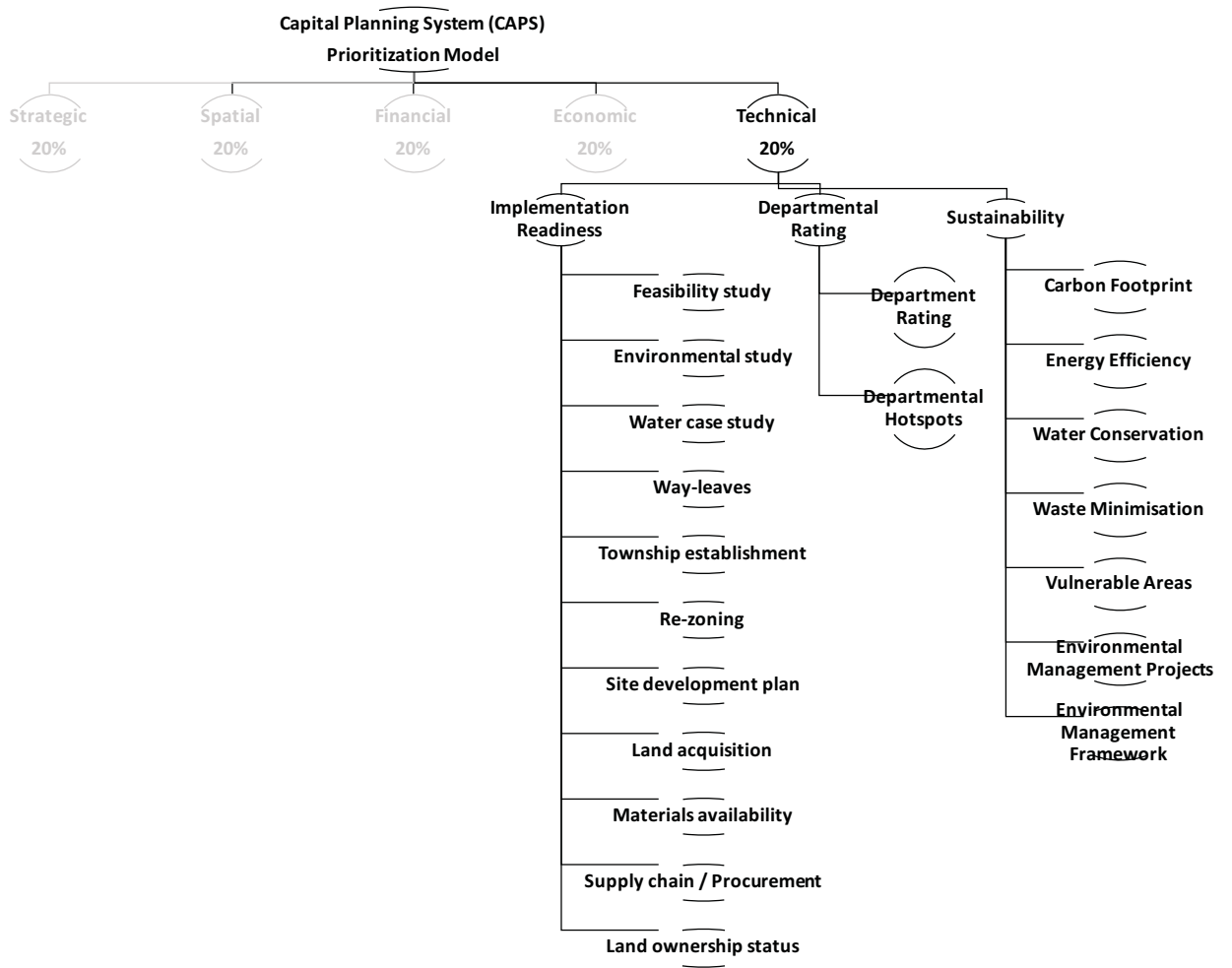
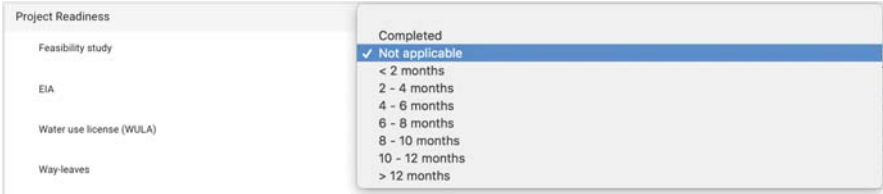


Figure B-59: Technical Alignment

B.2.4.6.1 Implementation Readiness


Table B-35: Implementation Readiness

| Category | Description |
|-----------------|---|
| Definition | <p>The project readiness criteria seeks to determine whether a project will be in a position to spend the allocated budget within the financial year in which the budget is requested. In other words, if a project still needs a record of decision on an Environmental Impact Assessment once the project budget has been awarded to the project, it may take between 6-8 months for the record of decision to be finalised. Therefore, the project will only realistically be able to start during the 2nd or 3rd quarter of the financial year. Projects with outstanding project readiness criteria are therefore penalised over projects that have all compliance documentation and approvals in place.</p> |
| Branch Weight | Implementation Readiness -> 34% |
| Input Variables | <p>A number of project readiness question categories are required to be filled in for each project, namely:</p> <ul style="list-style-type: none"> • Feasibility study • EIA • Water use license (WULA) • Way-leaves • Township establishment • Rezoning • Site development plan • Land acquisition • Ownership status • Materials availability • Supply chain / procurement • Project readiness comment / motivation • Geotechnical Study <p>Evidence of completion or compliance to any of these project readiness categories required documentation to be uploaded to the system as proof.</p> |
| Process | <p>The readiness score of a project is calculated as the <u>minimum score</u> achieved across all project readiness questions. Each of the project readiness categories allow for a standard set of responses, namely:</p> <ul style="list-style-type: none"> • Duration of time to meet compliance: < 2 months = 100 • Duration of time to meet compliance: 2 - 4 months = 90 • Duration of time to meet compliance: 4 - 6 months = 80 • Duration of time to meet compliance: 6 - 8 months = 50 • Duration of time to meet compliance: 8 - 10 months = 30 • Duration of time to meet compliance: 10 - 12 months = 10 |

| Category | Description |
|-----------------------|---|
| | <ul style="list-style-type: none"> • Duration of time to meet compliance: > 12 months = 0 • Duration of time to meet compliance: Completed = 100 • Duration of time to meet compliance: Not applicable = 100 <p>An example of the question categories and drop-down selections on the system is shown below:</p>  |
| Mathematical Operator | Minimum value achieved by the project achieved across all branches is passed through to the parent scoring branch. This is because project readiness is a compliance or governance test, so if for example and EIA is still required, the score of the project should be penalised, hence the minimum value is carried over. |

B.2.4.6.2 Departmental Rating

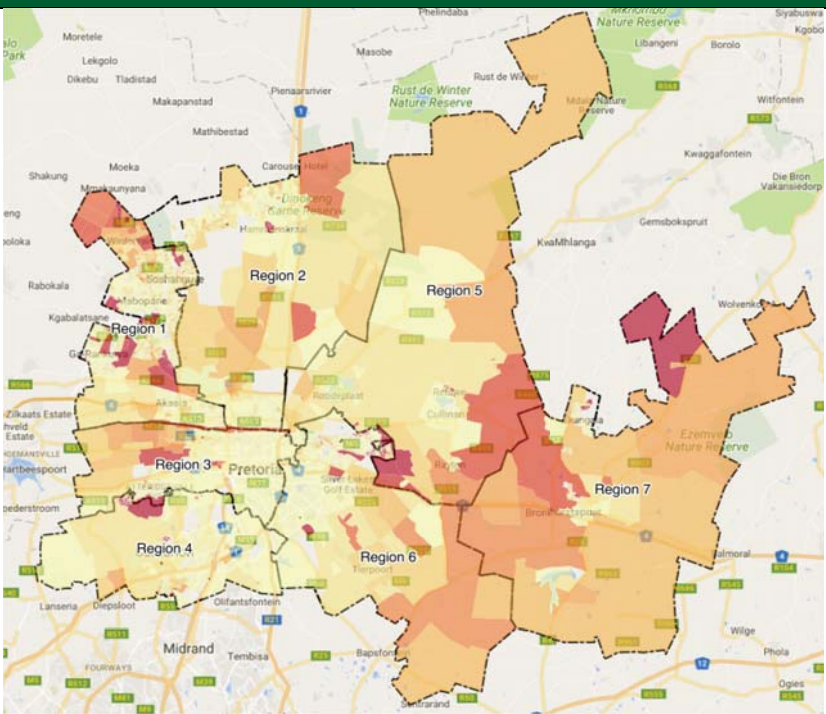
Table B-36: Departmental Technical Rating

| Category | Description |
|-----------------|---|
| Definition | The departmental rating incorporates the relative importance bestowed on each project by the originating department. A score out of 100 is asked and can be entered by means of a slider. Departments that do not introduce enough variability in their department's project scores are penalised somewhat. This is to prevent that a department marking all their projects as "100" or critical does not get an unfair advantage over departments that rates their projects honestly (i.e. numerous project scores ranging from 0 to 100). |
| Branch Weight | Department Technical Rating -> 33% |
| Input Variables | <p>The department technical rating is captured using a project priority rating slider for each project on the technical section of the project capturing screen.</p>  |
| Process | <p>The departmental rating score is a normalised score per project based on the range between the department's minimum project rating and maximum project rating. The above calculation is expressed by the following mathematical equation:</p> $Y = \frac{[TPR(\text{ThisProject}) - TPR(\text{Dept_Min})]}{[TPR(\text{Dept_Max}) - TPR(\text{Dept_Min})]} * 100$ |

| Category | Description |
|-----------------------|---|
| | <p>Where:</p> <ul style="list-style-type: none"> • Y = project score • TPR = Technical priority rating (between 0 and 100) • Dept_Min = lowest department project technical rating • Dept_Max = highest department project technical rating |
| Mathematical Operator | Maximum value achieved by the project is passed through to the parent scoring branch. Given that this test is a mathematical equation which only produces one answer per project, the mathematic operator on the branch is inconsequential. |

Table B-37: Sector Maps

| Category | Description |
|-----------------|--|
| Definition | The propose of the sector maps or infrastructure hotspot maps is to elevate project scores for infrastructure departments for infrastructure projects, by sector, which respond to sectoral infrastructure pressure points or demands. Only projects from the corresponding sector department can score on the corresponding sectoral spatial layer (i.e. a water project cannot score on an electricity hotspot layer, however it will score on a water hotspot layer). |
| Branch Weight | Departmental Hotspot Maps -> 33% |
| Input Variables | Project works location is used as the input to test the alignment of each project, provided it belongs to the corresponding sector or department, with the sector map or department infrastructure hotspot map shapefile provided by the municipality. A score is returned based on the spatial intersect between project works location and sector / infrastructure hotspot shapefile. |
| Process | <p>The following sector or departmental infrastructure hotspot maps have been created based on Statistics South Africa Census 2011 information at a small area level and the corresponding scoring layers are as follows:</p> <ul style="list-style-type: none"> • Water and Sanitation • Energy <p>A typical example of a electricity sector or departmental infrastructure hotspot map is shown below:</p> |

| Category | Description |
|-----------------------|---|
| |  <p> 0 - 10 10 - 20 20 - 30 30 - 40 40 - 50 50 - 60 60 - 70 70 - 80 80 - 90 90 - 100 </p> <p>Projects without works locations (i.e. city wide or administrative head quarter projects) receive a base score of 50.</p> |
| Mathematical Operator | Maximum value achieved by the project across all branches is passed through to the parent scoring branch. |

B.2.4.6.3 Sustainability

Table B-38: Carbon Footprint

| Category | Description |
|-----------------|---|
| Definition | The carbon footprint criterion evaluates extent to which the project may directly or indirectly reduce the carbon footprint of the municipality. |
| Branch Weight | Sustainability -> 33% Carbon Footprint -> 100% |
| Input Variables | <p>A risk question is posed under the project question categories and each project is required to complete the question, namely:</p> <ul style="list-style-type: none"> Does this project directly lead to a reduction of the city's carbon footprint? <p>The following responses can be captured by the user in a drop-down</p> |

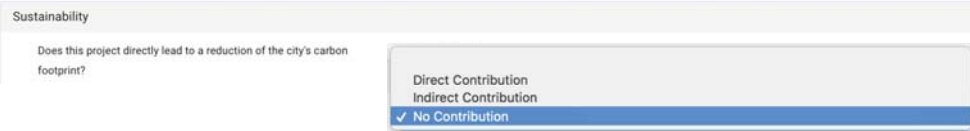
| Category | Description |
|-----------------------|--|
| | <p>menu:</p> <ul style="list-style-type: none"> • Direct Contribution • Indirect Contribution • No Contribution <p>An example of the question and drop-down selections on the system is shown below:</p>  |
| Process | <p>Each of the question responses carries a corresponding score based on the contribution rating of the response:</p> <ul style="list-style-type: none"> • Direct Contribution = 100 • Indirect Contribution = 50 • No Contribution = 0 |
| Mathematical Operator | <p>Maximum value achieved by the project is passed through to the parent scoring branch. Given that more than one answer option can be selected, the answer with the highest corresponding score is passed through to the parent branch.</p> |

Table B-39: Energy Efficiency

| Category | Description |
|-----------------------|--|
| Definition | The energy efficiency criterion evaluates extent to which the project may directly or indirectly improves the energy efficiency of the municipality. |
| Branch Weight | Sustainability -> 33% Energy Efficiency -> 100% |
| Input Variables | <p>A risk question is posed under the project question categories and each project is required to complete the question, namely:</p> <ul style="list-style-type: none"> • Does this project contribute directly to energy efficiency? <p>The following responses can be captured by the user in a drop-down menu:</p> <ul style="list-style-type: none"> • Direct Contribution • Indirect Contribution • No Contribution <p>An example of the question and drop-down selections on the system is shown below:</p> <div data-bbox="422 920 1380 1010" style="border: 1px solid #ccc; padding: 5px;"> <p style="font-size: small; margin: 0;">Does this project contribute directly to energy efficiency?</p> <div style="border: 1px solid #ccc; padding: 2px; margin-top: 5px;"> <p style="font-size: x-small; margin: 0;">Direct Contribution</p> <p style="font-size: x-small; margin: 0;">Indirect Contribution</p> <p style="font-size: x-small; margin: 0;">✓ No Contribution</p> </div> </div> |
| Process | <p>Each of the question responses carries a corresponding score based on the contribution rating of the response:</p> <ul style="list-style-type: none"> • Direct Contribution = 100 • Indirect Contribution = 50 • No Contribution = 0 |
| Mathematical Operator | Maximum value achieved by the project is passed through to the parent scoring branch. Given that more than one answer option can be selected, the answer with the highest corresponding score is passed through to the parent branch. |

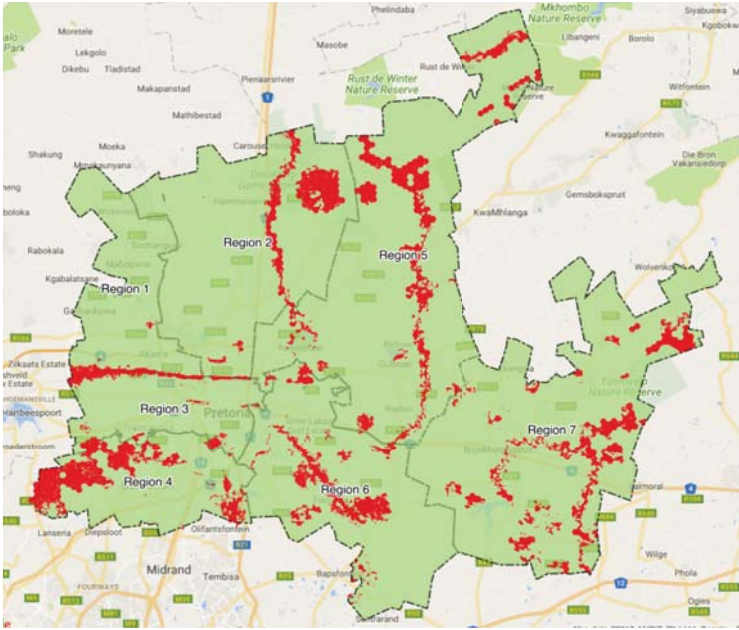
Table B-40: Water Conservation

| Category | Description |
|-----------------------|--|
| Definition | The water conservation criterion evaluates extent to which the project may directly or indirectly improves the water conservation of the municipality. |
| Branch Weight | Sustainability -> 33% Water Conservation -> 100% |
| Input Variables | <p>A risk question is posed under the project question categories and each project is required to complete the question, namely:</p> <ul style="list-style-type: none"> • Does this project contribute directly to water conservation? <p>The following responses can be captured by the user in a drop-down menu:</p> <ul style="list-style-type: none"> • Direct Contribution • Indirect Contribution • No Contribution <p>An example of the question and drop-down selections on the system is shown below:</p> <div data-bbox="427 913 1369 1003" style="border: 1px solid gray; padding: 5px;"> <p style="font-size: small;">Does this project contribute directly to water conservation?</p> <div style="border: 1px solid gray; padding: 2px;"> <p style="font-size: x-small; margin: 0;">Direct Contribution</p> <p style="font-size: x-small; margin: 0;">Indirect Contribution</p> <p style="font-size: x-small; margin: 0;">✓ No Contribution</p> </div> </div> |
| Process | <p>Each of the question responses carries a corresponding score based on the contribution rating of the response:</p> <ul style="list-style-type: none"> • Direct Contribution = 100 • Indirect Contribution = 50 • No Contribution = 0 |
| Mathematical Operator | Maximum value achieved by the project is passed through to the parent scoring branch. Given that more than one answer option can be selected, the answer with the highest corresponding score is passed through to the parent branch. |

Table B-41: Waste Minimisation

| Category | Description |
|-----------------------|---|
| Definition | The waste minimisation criterion evaluates extent to which the project may directly or indirectly improves waste minimisation of the municipality. |
| Branch Weight | Sustainability -> 33% Waste Minimisation -> 100% |
| Input Variables | <p>A risk question is posed under the project question categories and each project is required to complete the question, namely:</p> <ul style="list-style-type: none"> • Does this project contribute directly to waste minimisation? <p>The following responses can be captured by the user in a drop-down menu:</p> <ul style="list-style-type: none"> • Direct Contribution • Indirect Contribution • No Contribution <p>An example of the question and drop-down selections on the system is shown below:</p> <div data-bbox="435 913 1385 1003" style="border: 1px solid #ccc; padding: 5px;"> <p>Does this project contribute directly to waste minimisation?</p> <div style="border: 1px solid #ccc; padding: 2px;"> <p>Direct Contribution</p> <p>Indirect Contribution</p> <p>✓ No Contribution</p> </div> </div> |
| Process | <p>Each of the question responses carries a corresponding score based on the contribution rating of the response:</p> <ul style="list-style-type: none"> • Direct Contribution = 100 • Indirect Contribution = 50 • No Contribution = 0 |
| Mathematical Operator | Maximum value achieved by the project is passed through to the parent scoring branch. Given that more than one answer option can be selected, the answer with the highest corresponding score is passed through to the parent branch. |

Table B-42: Vulnerable Areas

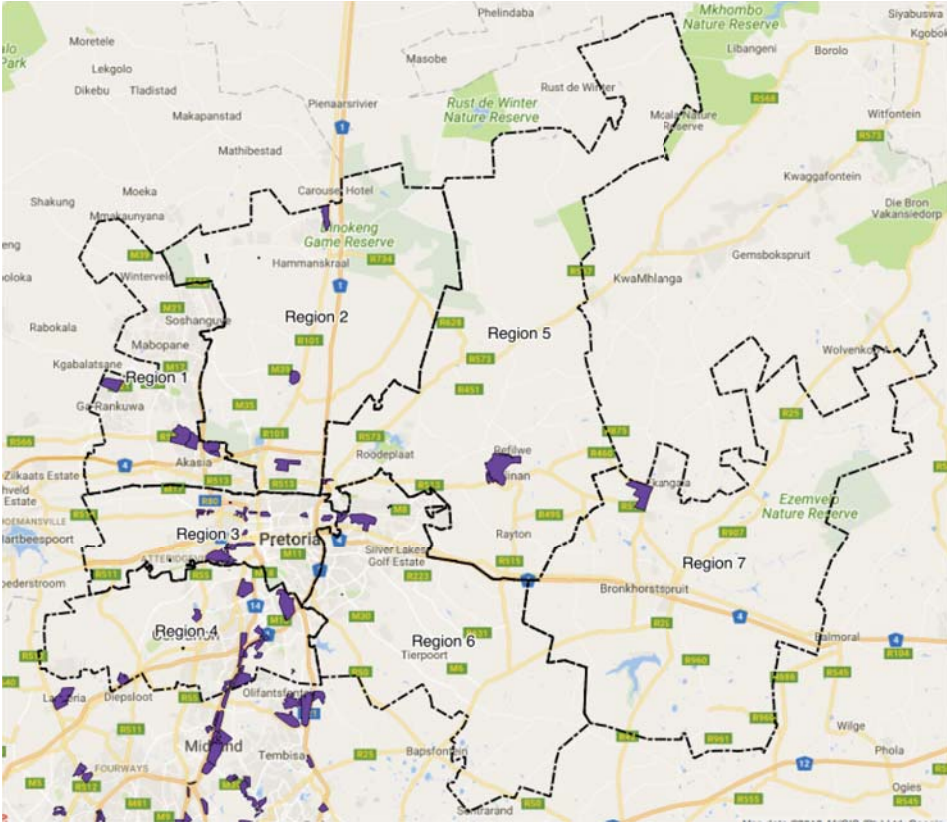
| Category | Description |
|-----------------|---|
| Definition | <p>A vulnerability analysis was undertaken as part of the Gauteng Conservation Plan (C-Plan) in order to identify areas where capital investments are discouraged owing to environmental protection concerns. Projects located in “irreplaceable areas according to the C-PLAN are scored lower than other projects based on their spatial intersect with these irreplaceable areas.</p> |
| Branch Weight | <p>The C-PLAN vulnerability assessment layers have been weighed differently. Therefore, all projects focussing on implementing projects within irreplaceable areas will receive a penalised score versus projects being implemented in low environmental impact zones. The following key areas has been identified as part of the C-PLAN vulnerability assessment:</p> <ul style="list-style-type: none"> • Irreplaceable Areas = 0% • Rest of the municipality = 100% |
| Input Variables | <p>Project works location is used as the input to test the vulnerability area score of each project based on the C-PLAN Vulnerability shapefile provided by the municipality. A score is returned based on the spatial intersect between project works location and C-PLAN Vulnerability shapefile.</p> |
| Process | <p>The C-PLAN Vulnerability shapefile for the municipality are shown below. If a the spatial intersect returns more than one C-PLAN Vulnerability shapefile intersecting with a project works location, then the minimum score between the intersects is passed to the parent branch.</p>  <p>The map displays the seven regions of Gauteng: Region 1 (northwest), Region 2 (north), Region 3 (west), Region 4 (southwest), Region 5 (central), Region 6 (south), and Region 7 (east). Irreplaceable areas are highlighted in red, while the rest of the municipality is in green. Key locations like Pretoria, Midrand, and Johannesburg are visible. A legend at the bottom left identifies the red areas as 'Irreplaceable Area' and green areas as 'Rest of Municipality'.</p> <p>Projects without works locations (i.e. city wide or administrative head quarter projects) receive a base score of 50.</p> |

| Category | Description |
|-----------------------|---|
| Mathematical Operator | Minimum value achieved by the project is passed through to the parent scoring branch. |

Table B-43: Environmental Project

| Category | Description |
|-----------------------|---|
| Definition | Sustainability, environmental protection and climate resilience are key focus areas for the City of Tshwane given that the city is a signatory to the C40 Cities of the world. C40 is a network of the world's megacities committed to addressing climate change. C40 supports cities to collaborate effectively, share knowledge and drive meaningful, measurable and sustainable action on climate change. Therefore, given the focus on environmental protection and sustainability, the "Environmental Management" department is given additional priority based on the fact that they are responsible for meeting the sustainability, environmental protection and climate resilience mandate of the municipality. |
| Branch Weight | 100% |
| Input Variables | Environmental Management projects are pre-filtered during this scoring test so that only environmental projects receive elevated score during this test. |
| Process | All environmental management projects receive additional score based on their alignment with the city's mandate of sustainability, environmental protection and climate resilience. |
| Mathematical Operator | Maximum value achieved by the project is passed through to the parent scoring branch. |

Table B-44: Environmental Management Framework

| Category | Description |
|-----------------------|--|
| Definition | A large industrial and commercial investment focus zone was identified as part of the Gauteng Environmental Management Framework (EMF) in order to identify areas where capital investments should be encouraged. Projects located within these areas according to the Gauteng EMF are scored higher than other projects located outside these areas. |
| Branch Weight | 100% |
| Input Variables | Project works location is used as the input to test the alignment of each project with the large industrial and commercial investment focus areas provided by Gauteng Province as part of the EMF. A score is returned based on the spatial intersect between project works location and EMF large industrial and commercial investment focus areas shapefile. |
| Process | <p>The EMF large industrial and commercial investment focus areas shapefile for the province are shown below. If a the spatial intersect returns more than one EMF large industrial and commercial investment focus areas shapefile intersecting with a project works location, then the maximum score between the intersects is passed to the parent branch.</p>  <p>Gauteng EMF Industrial and Large Commercial Focus Zone</p> |
| Mathematical Operator | Maximum value achieved by the project is passed through to the parent scoring branch. |

B.2.4.7 Budget Fitting Methodology

The previous section explained the purpose of the Capital Prioritisation Model (CPM) of the City of Tshwane as a systematic and objective methodology that provides a way to sort a diverse set of items / projects into an order of importance based on each project's alignment to the strategic, spatial or developmental, social, economic, environmental and financial objectives of the municipality.

However, this process alone does not result in a medium-term capital budget for the municipality. Once all projects have been subjected to the Economic Impact Model (EIM) and the Capital Prioritisation Model (CPM) and a ranking order of priority has been determined, a budget fit process is embarked on to determine which projects are included in the draft capital budget.

The purpose of this section of the BEPP is to discuss the methodology and rules or criteria used during the budget fit process, as well as to demonstrate how different choices regarding the budget fit rules or strategies will result in different capital budget lists or scenarios.

The simplified budget fit methodology can be summarised in a schematic diagram shown in the figure below. Essentially the budget fitting methodology is a systematic application of a set of rules and parameters which will result in a project either being added to the draft budget portfolio, or rejected from the draft budget portfolio.

Each of the budget fit steps will be discussed in turn in the following sections.

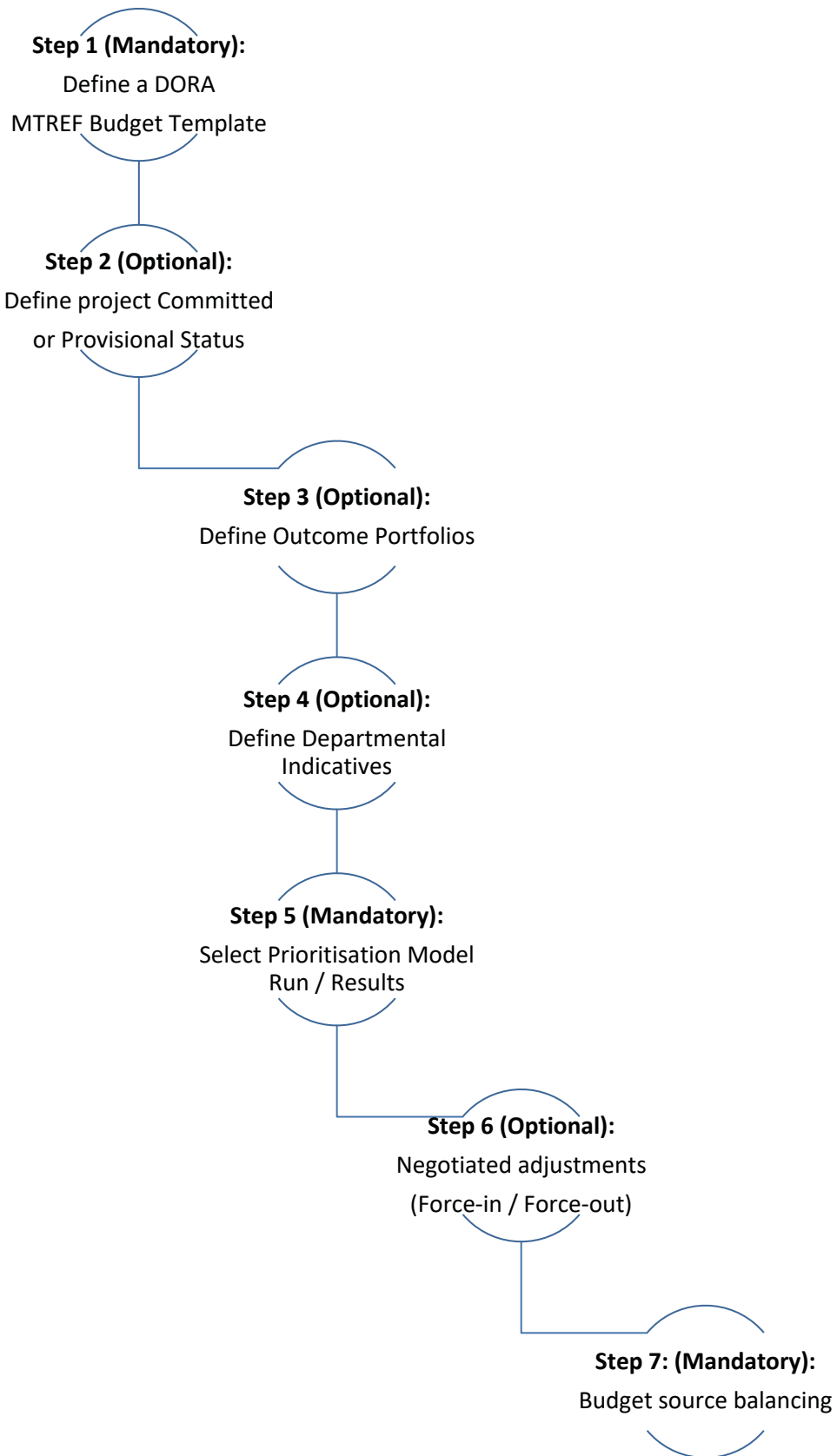


Figure B-60: Budget Fit Methodology

B.2.4.8 Step 1: Define a DORA MTREF Budget Template

The first step of the budget fit process is a mandatory step required to determine the municipal capital budget cap or total amount of available capital funding for the Medium-term Revenue and Expenditure Framework (MTREF). This is usually informed by a number of sources:

- Division of Revenue Act (DORA)

The Division of Revenue Act is published on an annual basis with the distinct purpose to document the equitable share and grant allocations to municipalities. The exact publication dates of the DORA may differ from year to year, but the City of Tshwane IDP process plan (refer to Figure B-61) allows for a draft DORA publication during the first two weeks of October and a final DORA publication during the first two weeks of February. The DORA publication will therefore set out all the external available capital funding for the municipality emanating from the national and provincial budgets. Typical funding sources for the municipal capital budget emanating from the DORA publication include:

- Public Transport Infrastructure Systems Grant (PTIS)
- Neighbourhood Development Partnership Grant (NDPG)
- Urban Settlements Development Grant (USDG)
- Integrated National Electrification Programme (INEP)
- Community Library Services (CLS)
- Social Infrastructure Grant (SIG)
- LG SETA Discretionary Allocation
- Integrated City Development Grant (ICDG)
- Housing Delft Grant

- City of Tshwane Financial Modelling

All internally generated capital budget funding is determined through financial modelling undertaken by the City of Tshwane Finance Department as part of their submissions to National Treasury on the Municipal Budget Reporting Regulations templates. Internal capital budget funding typically comprises the following funding sources:

- Council Funding: Funding generated from council revenue (i.e. rates and taxes).
- Public Contributions and Donations: Donations and bulk services contributions for capital expenditure to provide additional bulk capacity to service new developmental demand.
- Capital Replacement Reserves (CRR): Savings by the municipality for deferred capital expenditure to maintain the existing municipal asset base.
- Borrowings: External loans from the financial markets or bonds issued by the municipality to the financial markets.

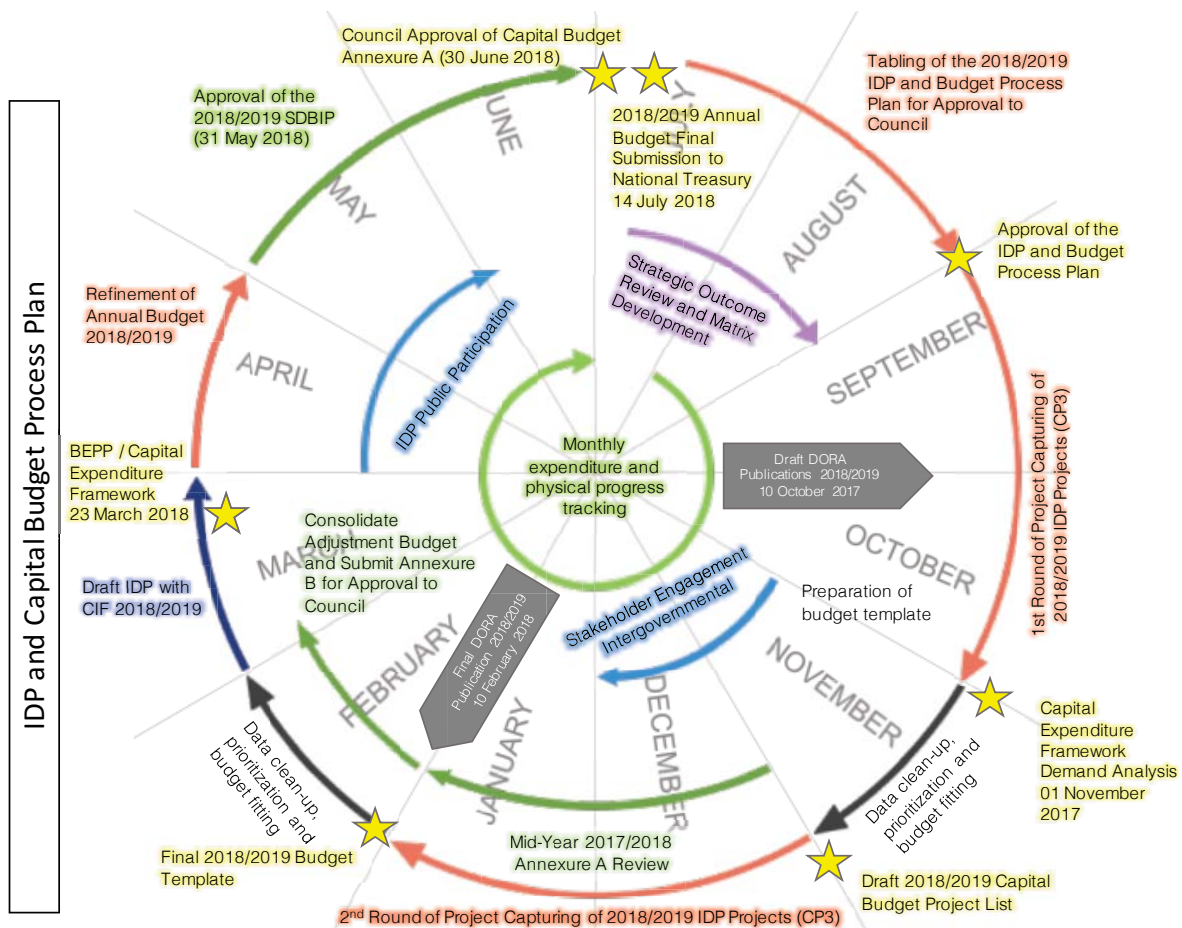


Figure B-61: City of Tshwane Integrated Development Plan (IDP) Process Plan

It is important to note that not all projects are eligible to utilise all funding sources. For example, the PTIS grant is only applicable to infrastructure directly supportive of public transport and the INEP grant is only applicable to electrification programmes and projects. Therefore, although the budget template cap for the municipality is equal to the sum of the DORA publication and all internal capital funding sources, a funding source balancing exercise should be undertaken prior to publishing the budget in order to ensure that only projects eligible for certain grants are funded by those grants.

B.2.4.9 Step 2: Define project Committed or Provisional Status

The next step in the budget fit process is regarded as an optional step, given that the municipality may decide to prepare a budget which either includes or excludes the budget fit impact of multi-year capital project commitments. In reality, no budget preparation process is undertaken in isolation and the effect or commitments published in the previous financial year’s approved capital budget (Annexure A) or the mid-year adjusted budget (Annexure B), will have an effect on the availability of capital funding for new projects to enter the budget list. The City of Tshwane CAPS system allows for two different project statuses during budget fit in order to account for the multi-year budget effect of projects which were previously published as part of either the approved or adjusted municipal capital budget:

- Committed Projects

Committed projects are those projects which formed part of either the approved capital budget (Annexure A) or the adjusted capital budget (Annexure B) of the municipality for the previous financial year, and which are contractually committed as assets under construction. Termination of any committed projects will result in either legal or financial liability for the municipality. Given commitments made on these projects by the municipality, the budget fit methodology regards these projects as non-negotiable, irrespective of their CPM project score. Furthermore, projects that fall under this category will be fitted to the capital budget in the financial year in which they request money (no delays may be applied) and they may exceed the municipal, portfolio or departmental caps which have been applied in the template.

- **Provisioned Projects**

Provisioned projects are those projects which formed part of either the approved capital budget (Annexure A) or the adjusted capital budget (Annexure B) of the municipality for the previous financial year, but which are not contractually committed as assets under construction. Termination of any provisioned projects will not result in either legal or financial liability for the municipality. The budget fit methodology regards these projects as having a higher priority than normal projects in the list (given their status received during previous MTREF budget publications) however their implementation timeframes are negotiable to an extent. Projects that fall under this category will be fitted to the capital budget in the financial year in which they request money only if there is sufficient capital budget available in the capital budget template and they may not exceed the municipal, portfolio or departmental caps which have been applied in the template. If the capital budget requests exceed the municipal capital budget template either at a municipal, portfolio or departmental indicative level, then provisioned projects may be fitted with delay to a financial year where there is sufficient municipal capital budget cap available.

From the above it is evident that the classification of committed and provisioned status of projects may have a profound impact on the content of the capital project budget list. For example, if the entire adjusted budget capital project list of the municipality is regarded as committed, then the only discretionary expenditure available to the municipality will be the difference between the adjustment budget bottom line for year 2 and year 3 of the MTREF and the available capital budget sources, as well as the total budget cap for year 3 of the MTREF, given that the adjusted budget publication does not extend to the third year of the new MTREF budget.

It is therefore recommended that only those projects which meet certain stage-gate requirements or which can provide documented proof of commitment (i.e. contracts demonstrating asset under construction status) should be marked as committed. All other projects published in the approved or adjusted MTREF budget publications should be marked as provisioned projects.

B.2.4.10 Step 3: Define Outcome Portfolios

The budget template which is the primary input to the budget fit also allows the municipality to define capital budget amounts for key portfolios. The definition of portfolios and setting up budget cap amounts per portfolio is also an optional step in the budget fit process. These

budget amounts will be ring-fenced for these portfolios and only projects which are earmarked to form part of those portfolios may compete for those budget amounts. For example, suppose the municipality executives decide that 15% of the total municipal budget must be ring-fenced for repairs and maintenance of existing assets. The budget template could be used to ring-fence 15% of the total capital budget for a portfolio called “Repairs and Maintenance”.

During the budget preparation period, projects would be classified as contributing to the “Repairs and Maintenance” portfolio by virtue of their MSCOA project segment classification. When the budget fit is executed, projects which belong to the “Repairs and Maintenance” portfolio will be fitted to the budget in order of highest CPM score to lowest CPM score until the budget cap of the “Repairs and Maintenance” portfolio has been reached.

This does not mean that no other repairs and maintenance projects will be fitted to the capital budget. It simply means that their preferential treatment during the budget fit process has been depleted and that the remaining repairs and maintenance projects will have to compete on an even keel with other capital requests based on their CPM score.

Setting up of various portfolio budget caps based on the outcome which is achieved by each of the portfolios is one mechanism by which a municipal capital budget could be generated based on the desired outcomes which the municipality advocates in their strategic documents.

B.2.4.11 Step 4: Define Departmental Indicatives

The fourth step in preparing the budget fit template allows for the municipality to set departmental budget caps or indicatives. The setting of budget cap amounts per department is also an optional step in the budget fit process. Departmental caps can be set for all departments or only for some departments. For example, some projects have difficulty competing effectively for budget owing to their nature. Capital investments in the municipal zoo or purchasing of capital movables in the form of library books may struggle to compete on a CPM score basis with utility services projects such as water and sanitation or electricity.

Setting of departmental indicatives or departmental budget caps could be an alternative strategy to provide a minimum budget threshold amount for departments who struggle to compete effectively for capital budget based on the CPM project score. The budget fit mechanism for departmental indicatives or departmental caps works on much the same basis as the portfolio caps. The departmental budget amounts will be ring-fenced per department and only projects which are earmarked to form part of those departments may compete for those budget amounts. When the budget fit is executed, projects which belong to the ring-fenced departments will be fitted to the departmental budget cap in order of highest CPM score to lowest CPM score until the budget cap of that department has been reached.

B.2.4.12 Step 5: Select Prioritisation Model Run / Results

The prioritisation model (including the Economic Impact Model) must be run prior to undertaking any form of budget fit. Therefore, the selection of a prioritisation model and its associated results is a mandatory step in any budget fit process.

When the budget fit is executed, as a rule, projects will be in order of highest CPM score to lowest CPM score until the municipal, portfolio or departmental budget caps has been reached, depending on the budget template which has been specified.

A visualisation of the budget fit result in the CAPS system is shown in Figure B-62. This shows the ranking of projects from highest CPM priority (on the right) to lowest CPM priority (on the left). Each project is shown as a stacked bar in bar graph format, where the sum of the MTREF financial year capital requests for the projects (total MTREF capital budget) is shown as the height of the bar.

The budget fit status of each project, after executing of the budget fit routine, is shown below the bar graph in colours. Each colour represents a different status. In the example provided, the orange projects represent committed projects, which means they were fitted irrespective of their CPM project score in the financial year in which they requested budget.

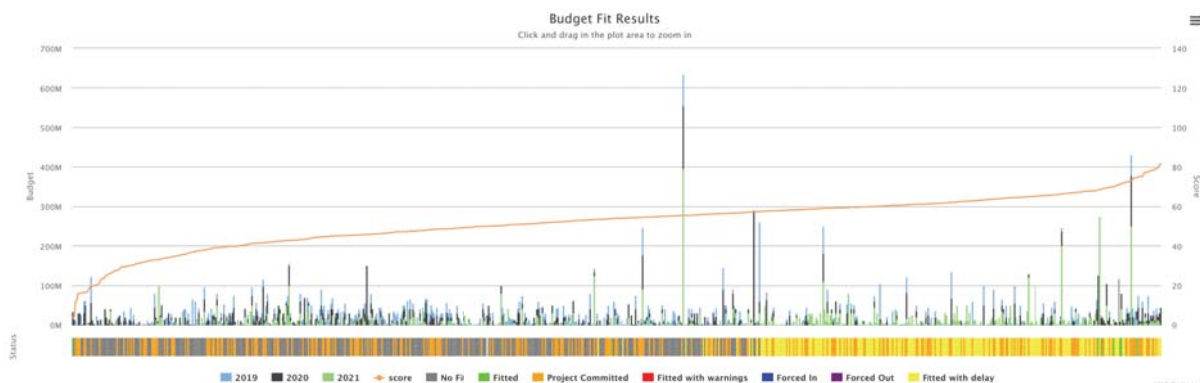


Figure B-62: Visualisation of Budget Fit Results on CaPS

Green projects represent projects which were fitted based on their CPM project score in the year which they requested funding, given that there was available capital budget available in that financial year. The yellow projects represent projects that were fitted with delay. These projects received high scores on the CPM but there was not sufficient budget available in the financial year in which they requested capital funding, therefore the budget fit routine fitted them to a financial year later than they requested budget, where sufficient available capital budget was available in the budget template.

B.2.4.13 Step 6: Negotiated adjustments (Force-in / Force-out)

Once a draft capital budget has been developed using the budget fit process, the portfolio of projects which make up the draft capital budget needs to undergo a number of municipal approvals, namely:

- Technical Budget Steering Committees
- Political Budget Steering Committees
- Mayoral Lekgotla’s
- Mayoral Meetings
- Council Meetings

It is inconceivable that any portfolio of capital projects which has been prepared in a complex multi-disciplinary collaborative framework will meet all the political expectations of the political dispensation. Therefore, a negotiated adjustment process is accommodated in the budget fit process whereby projects can be added or removed from the portfolio of capital projects based on motivations and representations made during budget forums.

B.2.4.14 Step 7: Budget Source Balancing

The last step in the budget fit process is to ensure that all available funding sources documented in the Budget Fit Template have been utilised in full and that none of the funding sources are over-subscribed. The funding source balancing is also the last check to ensure that all projects which are linked to grant funding are eligible according to the funding definitions and rules as set out in the Division of Revenue Act (DORA).

B.3 Institutional Arrangements

B.3.1.1 BEPP Steering Committee

During the previous reporting period the City mentioned that a department will be identified that will take ownership of the BEPP Process. Since then, City Planning has established the Built Environment Performance Plan Steering Committee (BEPPSCO) with the purpose to guide the City towards not only generating a Built Environment Performance Plan, but also to move towards integrated planning and development. The said steering committee will have to ensure full integration with the IDP Office, Finance as well as Metropolitan Spatial Planning and City Strategies.

B.3.1.2 Spatial Development Framework inputs

The City is in process to draft and approve a new Spatial Development Framework. The draft Spatial development framework is in circulation for comments and will be revised after which it will be approved. It is however expected that the strategic priority of the city will not be adjusted significantly.