

# **STRATEGIC REVIEW OF BUILT ENVIRONMENT INFRASTRUCTURE 2015-16**



NOVEMBER 2015

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## PART A - Introduction

### PURPOSE

The purposes of this Review are to:

Support the BEPP 2016-17

Provide an single overview of eThekweni's state of Built Environment Infrastructure.

### DEFINITIONS OF INFRASTRUCTURE

The BEPP has "Infrastructure", in its broader meanings, as a central focus.

Though there is not a legislated definition of infrastructure, in practice it includes the production of all physical assets (land, engineering services, and buildings) that serve as the platform for economic, social, and residential activities. The NDP refers to infrastructure in this broader sense. At a more specific level, the Division of Revenue Act (DORA) 2014-15 makes numerous references to infrastructure in text and tables, in a wide range of capital grants, and over numerous social and technical sectors.

Infrastructure includes Core Infrastructure, Economic Infrastructure, Social Infrastructure, and Mixed Use. <sup>[1]</sup> The following are regarded as Infrastructure Projects: <sup>[2]</sup>

- Economic Infrastructure is the result of own investment and that of other spheres and the private sector in Land Production, Public Spaces, and Buildings for Industry, Retail, Office, Mining, Ports, Airports, Freight Systems, and Agriculture developments. Economic Infrastructure also includes PPP's and site-sharing where public and private investments will result in a range of public and private services being offered on the same site (e.g. commercial and social services being offered at transport interchanges).
- Social Infrastructure is the result of own investment and that of other spheres and the private sector (including households) in Land Production, Public Spaces, and Buildings for: Residential Uses; the provision of Municipal Social and Emergency Services, and; the provision of Other Government Services (particularly Safety & Security, all levels of Education and Health care, justice, Social Grants Pay-Points, Basic Recreation, clusters of Social Facilities, and Government Malls)
- Mixed Use Infrastructure includes projects aimed at accommodating a mix of Economic and Social uses, either vertically or adjacent to each other, in either Brownfields projects such as urban redevelopment, or in Greenfields locations.
- Core Infrastructure includes construction or expansion of: Sewer or Water Treatment Works. Sewer or Water Trunk Mains, Water Reservoirs, Pump Stations, Electrical Substations, Alternative Energy Installations, Freeway Interchanges, Road Bridges, Arterial and Collector Roads, Public Transport Routes and Facilities, and ICT networks, all aimed at social, economic or mixed uses.

The project cycles of all infrastructure projects include associated statutory planning, building and environmental approvals

1 Guidance Note for the Built Environment Performance Plan 2015/16 – 2017/18. Oct 2014, National Treasury

2 Cities-PPF Policy Framework. NT and DBSA. Draft. Apr 2015

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- Accessibility Mapping & Optimisation of Community Social Services In Ethekwini. Ethekwini Municipality. Prepared by CSIR. 2008. Updated 2010, 2013, 2014.
- Census 2011 and the latest 2012 data. Global Insight. 2012
- Census 2011. Statistics SA. 2012
- Cities-PPF Policy Framework. NT and DBSA. Draft. Apr 2015
- Ethekwini City Density Strategy, May 2013
- Ethekwini Municipality 2011 Dwelling Count. Projected to 2014. EMA. Jan 2013.
- Guidance Note for the Built Environment Performance Plan 2015/16 – 2017/18. Oct 2014, National Treasury
- Industrial Land Study & Land Strategy Development: Phase 2: Land Study Analysis. EMA. Prepared by The Planning Initiative Team. Mar 2014
- Municipal Services and Living Conditions Survey - 3 year Trends. Corporate Policy Unit. 2014

## ACRONYMS

Bn	Billion
BoP	Back of Port
BRT	Bus Rapid Transport
C1	Corridor 1
C3	Corridor 3
CBD	Central Business District
CHC	Community Health Centre
CT	Cape Town
DU	Dwelling Unit
D'MOSS	Durban Metropolitan Open Space System
DWA	Department of Water Affairs
EIA	Environmental Impact Assessment
Eskom	Electricity Supply Company
ETA	Ethekwini Transport Authority
EU	European Union
GDP	Gross Domestic Product
Ha	Hectare
ICT	Information & Communications Technology
IG	Inter-governmental
INK	Inanda, Ntuzuma, Kwa Mashu
IRPTN	Integrated Rapid Public Transport Network
ITP	Integrated Transport Plan
KTC	Kwa Mashu Town Centre
KZN	KwaZulu-Natal
LED	Local Economic Development
MR	Main Road
MTEF	Medium Term Expenditure Framework
PRASA	Passenger Rail Agency of South Africa
RDP	Reconstruction & Development Program
SA	South Africa
SAPS	South African Police Service
SDF	Spatial Development Framework
SDP	Spatial Development Plan
SMME	Small, Medium & Micro Enterprises
SPLUMA	Spatial Planning & Land Use Management Atct
WUL	Water Use Licence
WWTW	Waste Water Treatment Works

## PART B – Strategic Review of the Built Environment

The purpose of this Part is to review the performance of eThekweni’s built environment against the benchmark of an efficient, equitable, and connected city, and along the way to quantify metropolitan trends and pressures, and to identify challenges and impediments.

### KEY SPATIAL AND LOCATIONAL FEATURES

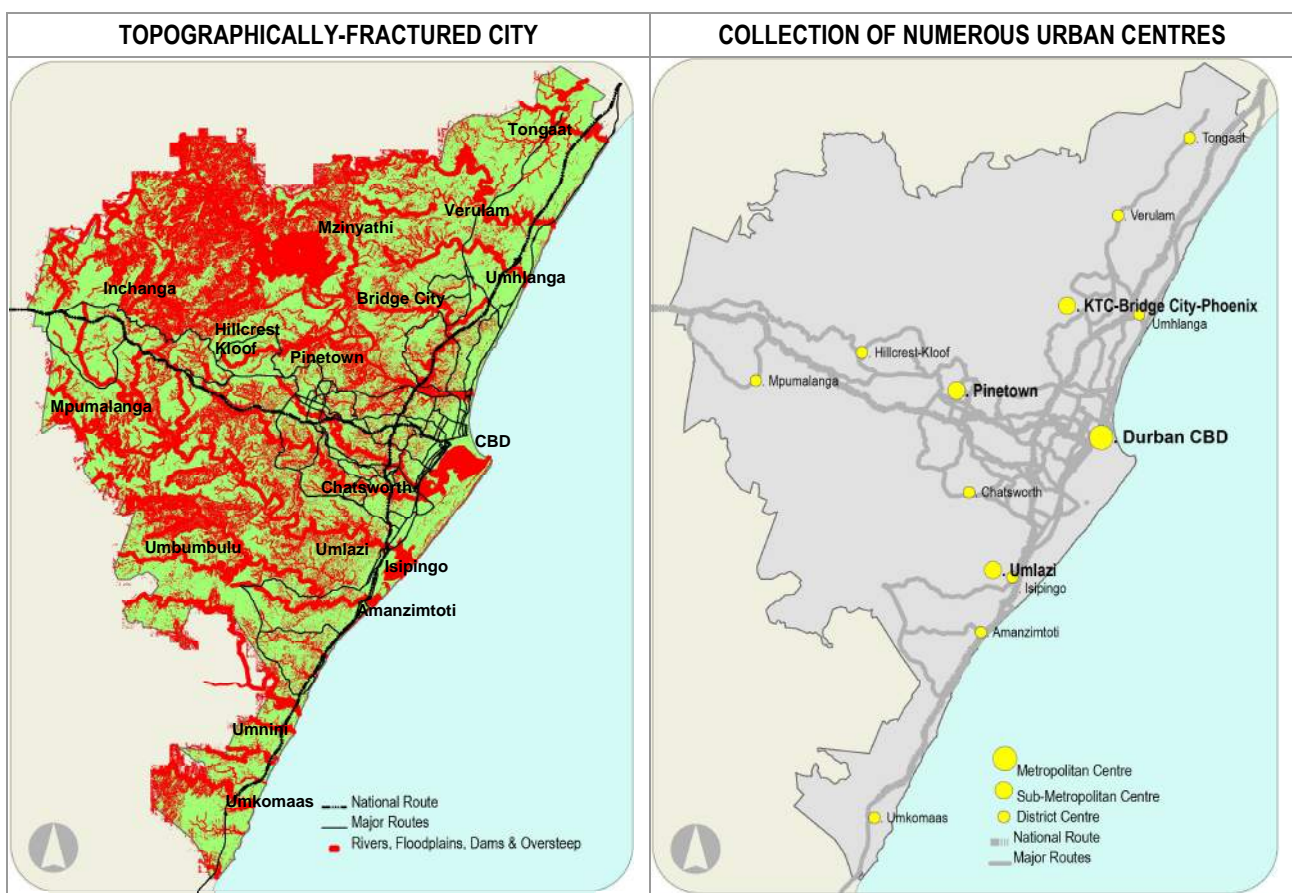
eThekweni is a gateway city for trade and travel, and is very much part of a provincial, national, sub-continental and global economic network. Its place-specific competitive advantages are a very well-developed and maintained port & airport, world-class movement & communication systems, and a strong local economy with several mature economic sectors (freight, manufacturing, finance).

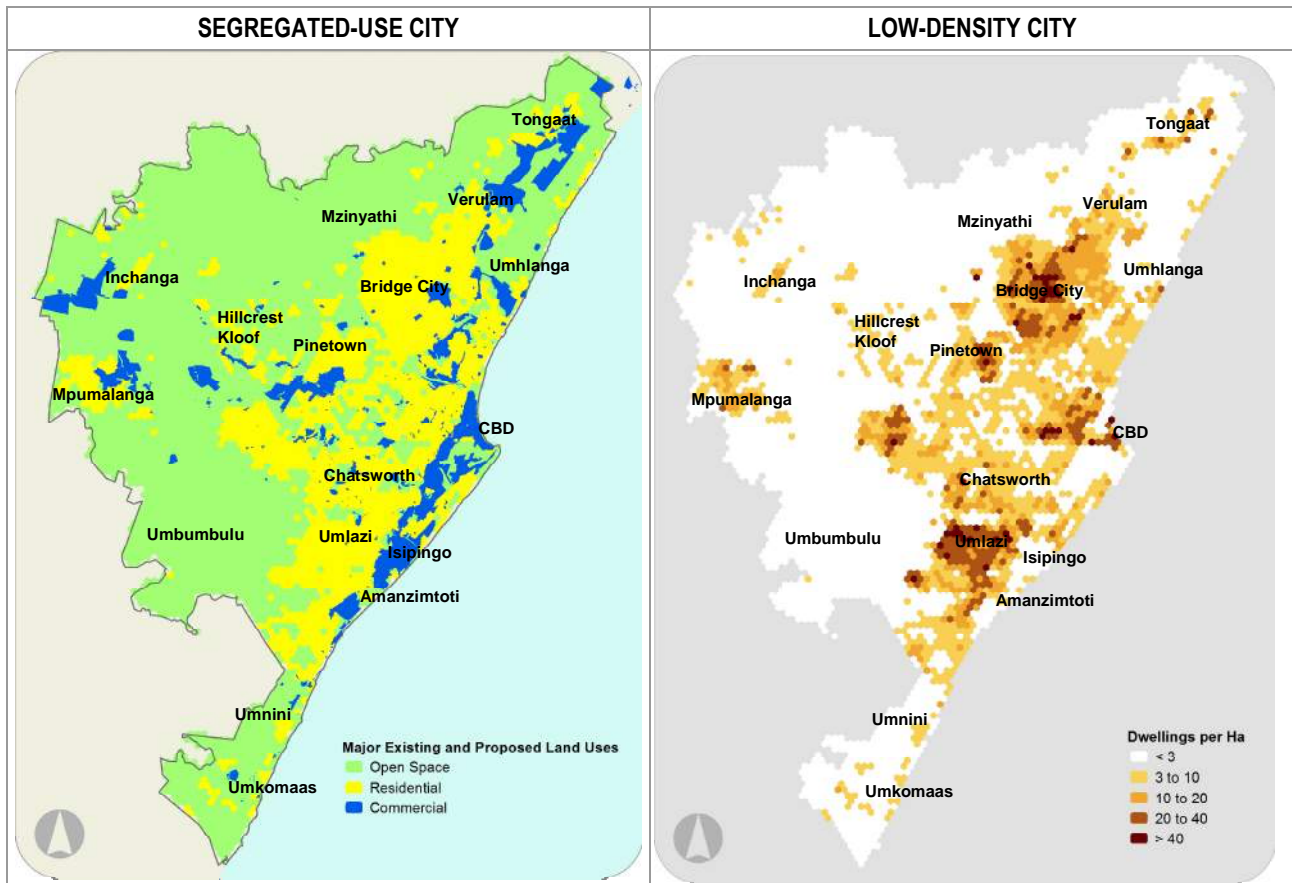


eThekweni’s structure is not the result of planned growth or a vision of urban form, but of the extension of its boundaries over time to incorporate low-density urban settlements and adjoining farmlands, and the extreme topography. The city is spatially fragmented, vast and complex, and economic uses are spatially segregated from residential uses.

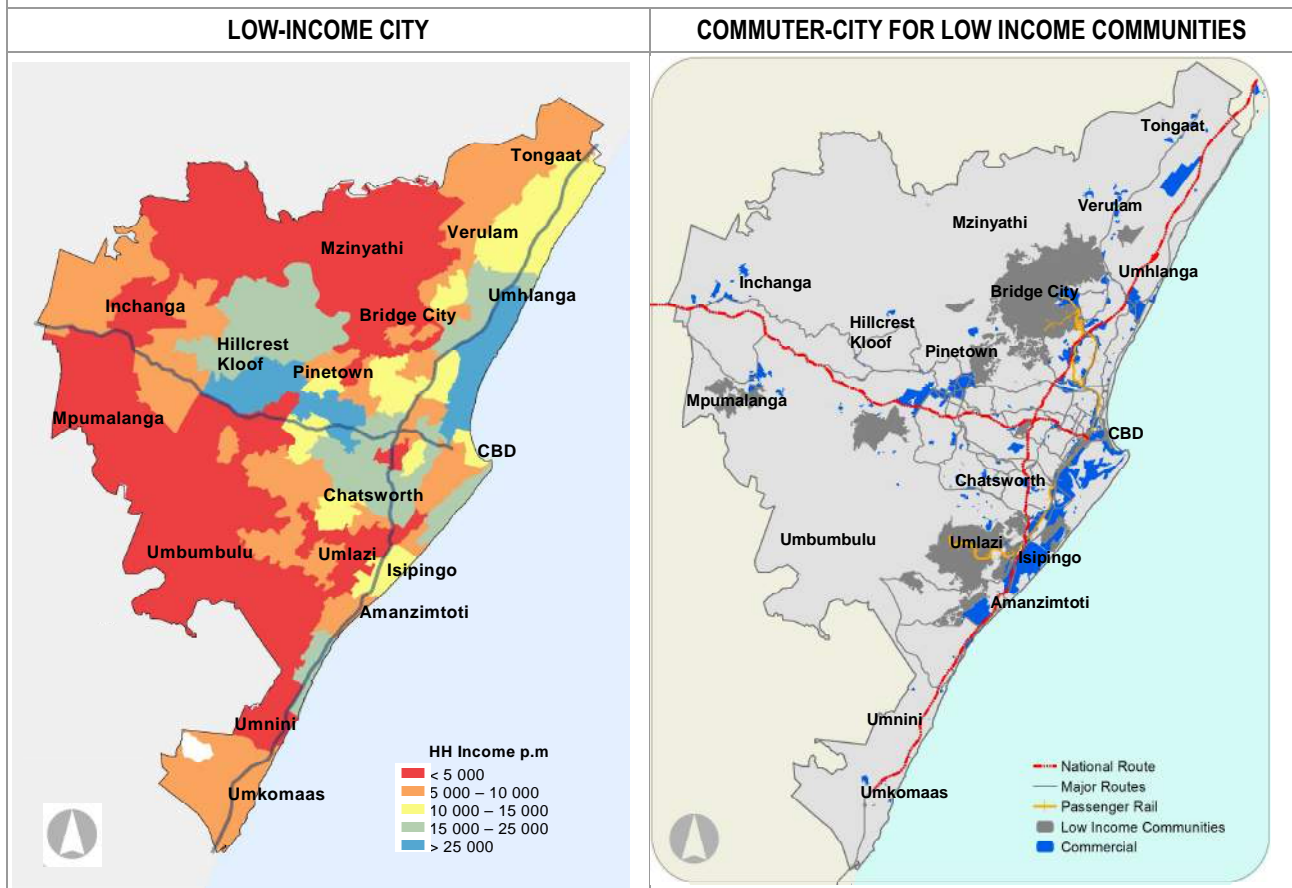
The negative consequences of the combination of spatial fragmentation, segregation of uses, and low density are to:

- Reduce the access that residents can enjoy to places of residence, to employment, and to social facilities.
- Contribute to economic challenges, especially: Increased trade costs across many sectors of the local economy; Low-density residential customer bases creating barriers to LED in residential areas; Absence of or low levels of LED in residential areas in turn creating a barrier to mixed land uses.
- Lead to major transportation-related problems, especially: Public transport which is inefficient, or unsustainable or even non-viable; Long commuting times (average for the majority of eThekweni commuters is 2 hours per day), which impacts negatively on labour productivity and on domestic cohesion, and; High relative transport costs per low-income household
- Promote inefficient infrastructure, especially: High costs per dwelling or business for pipe runs, and road lengths; High costs per dwelling for engineering maintenance and operations, and; Unused capacity.
- Promote environmental degradation through high energy requirements of and pollution by transport





The gross household density of eThekweni is 4.17 to 4.24 DU per Ha. Umlazi, CBD, Sydenham, and Clermont have 20 to 40 DU / Ha, INK has an average of 15 to 30 DU / Ha, and the remaining suburbs have 3 to 10 DU / Ha.



EThekweni is a low-income city. It has a high GINI Co-efficient of 0.63 <sup>[3]</sup> (the same as the SA average), and the average per capita income is a little over R 4,000 p.m., lower than most of eThekweni’s metro peers. Of the 3,871,409 population and 974,572 households <sup>[4]</sup>, almost a third live below the food poverty line.

The spatial aspects of eThekweni as a low-income city are the marked spatial separation between income groups, and how they relate to economic uses, which traces back to race-based planning. Except for Umlazi and Clermont, low-income suburbs have been the furthest away from major employers, middle-income suburbs have been somewhat closer, and high-income suburbs have been closest to employment, except for Hillcrest Kloof. This pattern is starting to be mitigated by improved connectivity afforded by the new sub-metropolitan route MR 577 linking INK to Pinetown, and the upgrade of Inanda Road from INK to Hillcrest. The pattern of lowest income furthest away is also starting to be reversed in two locations, by Greater DTP and Greater Cornubia, which in time to come will offer significant employment opportunities close to INK, and by the Keystone development close to Mpumalanga. The establishment of major retail centres in Umlazi, Bridge City, and Mpumalanga go some way to improve trip efficiencies for consumption and to bring retail, finance, and service industries closer to low-income households. However, there is still a long way to go to creating a highly connected and better integrated city, and there will always be a degree of separation of higher-order economic uses from residential settlement.

## PUBLIC PERCEPTIONS OF THE BUILT ENVIRONMENT

<sup>[5]</sup>

Though there are noticeable expressions of dissatisfaction around informal settlements and non-formal dwellings, the majority of citizens reported satisfaction with the built environment’s performance. This contrasts sharply with dissatisfaction with living standards. Though perhaps not explicit, there is a built environment connection, in that living standards are adversely affected by inefficient urban form, particularly long and expensive commutes to employment or education. Living standards are linked also to the economic performance of the city, which itself has a spatial dimension. The system for income distribution, as another key influence in living standards, is more of an issue for economic policy, and less so for the built environment.

2014 rating	For	Improvement or decline since 2011	
Satisfied	Basic Household Services (all areas)	-	Unchanged
Very Dissatisfied	Management of informal settlements	-	Unchanged
Dissatisfied	Informal and traditional dwellings	▼	Significant decline
Dissatisfied	Law Enforcement	▼	Significant decline
Satisfied	Toilets	▼	Slight decline
Satisfied	Water	▲	Slight improvement
Satisfied	Refuse	▼	Slight decline
Satisfied	Electricity	-	Unchanged
Satisfied	Dwellings	▼	Slight decline
Satisfied	Public Transport	-	Unchanged
Dissatisfied	Roads Maintenance	▼	Slight decline
Satisfied	Interface between Citizenry and Municipality	▼	Slight decline
Satisfied	Access to Community Facilities	-	Unchanged
Satisfied	Maintenance of Community Facilities	-	Unchanged
Satisfied	Emergency Services	-	Unchanged
Satisfied	Clinics	-	Unchanged

3 Census 2011. Statistics SA. 2012

4 Ethekewini Municipality 2011 Dwelling Count. Projected to 2014. EMA. Jan 2013.

5 Municipal Services and Living Conditions Survey - 3 year Trends. Corporate Policy Unit. 2014



## ECONOMIC INFRASTRUCTURE

### Key features of the Local Economy

eThekweni is home to Africa’s premier multi-modal logistics platform and international passenger airport, Africa’s busiest port, and a global trade, conferencing, sporting and tourist destination. It is the economic powerhouse of KwaZulu-Natal and makes a significant contribution to the SA economy. It is a vital link between the regional economies of Pietermaritzburg (and onward to Gauteng) and Richards Bay. eThekweni is the second largest economic centre and the second most significant industrial region in South Africa. It is a promising global competitor with a world-class manufacturing sector. It is also a substantial administrative centre, providing key public services within the City as well as to the wider region. It is home to 10% of all employment opportunities in South Africa.

On the negative side, [6] eThekweni has:

- Under-investment in sectors other than transport, storage and communications
- Under-production of export goods
- Underdeveloped SMME sector
- Missed opportunities for better business linkages in maritime, tourism, production, ICT
- Delays in industrial land production caused by slow rate of statutory approvals
- Insufficient growth of the municipal rates and revenue services base
- A relatively small labour force in relation to its population size
- An under-skilled workforce
- Out-migration of skilled persons

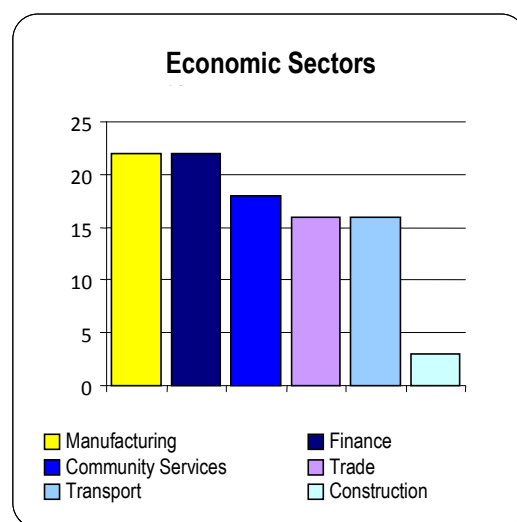
### Snapshot Economic Indicators

Item	As At 2013 Unless Otherwise Specified	Benchmark	Trend
Pop. Formal Employment	305,735 or 8.6%	-	
Pop. Informal Employment	205,000 or 5.77%	-	
GDP	R222.6 Bn <sup>(2014)</sup>	2013	Increase
Imports	R78 Bn i.e. 9.8% share of SA imports	2013	Increased No.
Imports from Asia-Pacific	R45 Bn i.e.58% of local imports	2013	Increased No.
Total Exports	R49 Bn i.e. 5.9% of SA exports	2013	Increased No.
Exports to Africa	R18 Bn i.e. 37% of local exports	2013	Increased No.
Exports to EU	R18 Bn i.e. 36% of local exports	2013	Increased No.

### Economic Activity by Sector

GDP growth in the eThekweni Municipality increased by 3.5% between 2011 and 2012 while KwaZulu-Natal and South Africa grew by 2.5% and 3.0% respectively.

The eThekweni economy is dominated by tertiary industries. Manufacturing, a secondary sector, constituted 22% of the economic activity, led by food & beverages, as well as fuel, petroleum, chemical & rubber products that contributed to manufacturing. [7]

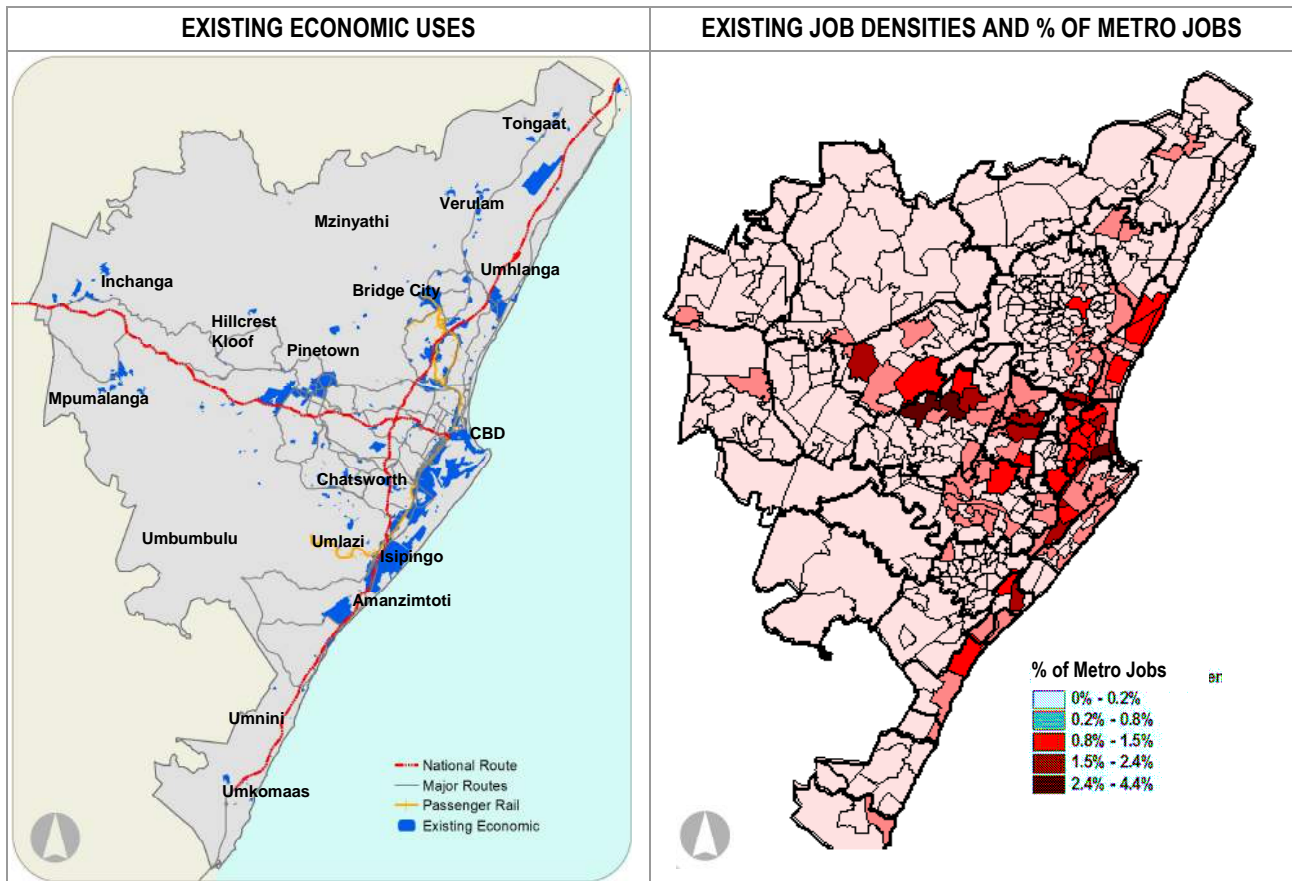


6 Economic Development and Job Creation Plan. Draft. EMA. Prepared by Urban Econ. Oct 2014  
 7 Census 2011 and the latest 2012 data. Global Insight. 2012

## Uses Trends by Location

North	Airfreight
Central	Sea-freight & manufacturing
West	National distribution
Existing industrial areas	Manufacturing & freight

The majority of economic activity is grouped around the Port, Back of Port and Southern Industrial Basin. There is also significant concentration in Greater Pinetown and there are significant though fragmented concentrations in the North, and the Outer West sub-metropolises.



Job densities reflect the locations of the major economic uses, and are supplemented by domestic employment and services in middle and high-income areas. Job densities are lowest in Umlazi, INK, Mpumalanga, the non-urban areas, and the greenfields belt between the R102 and the N2 in the North. The scope for improving job densities is highest for the greenfields, and will be through industrial and mixed used development. The prospects for job densities to improve in Umlazi, INK, and Mpumalanga are comparatively limited, as its is unlikely that there is either the vacant space in sufficiently large pieces, or the investor confidence, for major economic uses to locate themselves, there in the medium term. The exceptions to this could and should be the BRT route along MR 577, which is under construction, the further development of Bridge City and its integration with Phoenix Industrial and KwaMashu Town Centre, and the redevelopment of the Umlazi V-Node and Reunion Station Precincts. The other prospects that do exist are for retail, services, and LED. If the local economy improves and the income disparities decline, then the large townships could also begin to offer significant domestic employment. For the non-urban areas, prospects for improved job densities appear to be for retail, services, and agri-processing in the larger non-urban settlements, and for intensive agriculture and tourism further afield.

## **Land Currently Serviced and Zoned for Economic Uses**

[8]

A key spatial expression of the metropolitan economy is industrial land (used interchangeably here with 'land for economic uses'). 16,730 Ha of land is currently serviced and zoned for economic uses. Of this, 14,400 Ha have been built up. 2,700 Ha is vacant. Current demand is in the range of 30 - 50 Ha p.a.. At these rates, the fallow land could theoretically satisfy supply for 30 - 50 years. There is however a perception by developers and property investors of un-served demand. Latent demand may be higher than this if serviced land was readily available, as demonstrated through the rapid sales at Cornubia.

For 700 Ha of the fallow land is in the Outer West, take up is likely to be quick, as it has only recently been developed and enjoys good access to the N3, and will deal with localised demand for national distribution centres. For the fallow industrial land elsewhere, the prospects of take-up are not as optimistic, for the probable reason that this land is not well located and-or not appropriately serviced for the current demand (e.g. high speed broad band access, or roads that can accommodate interlinked vehicles). This raises the question of how to manage this land: should it be rezoned to a more suitable use or; should it be upgraded to meet new demand trends, and-or; should urban management issues be addressed that may be affecting the attractiveness of the area for investors and businesses.

## **National and Provincial Competition in the Industrial Land Market**

What could be influencing the lack of take-up is land-price competition with Johannesburg, Cape Town, Richards Bay, and Pietermaritzburg. The average rentals of R 36-40 per m<sup>2</sup> on eThekweni's industrial land are similar to the average rentals in competing cities, but at R 1,250 per m<sup>2</sup> its average land value is 30% (Jozi & CT), 200% (Richards Bay) to 400% (Pmb) respectively higher than competing cities. High land prices compared to competing cities drags down the ROI for developing industrial land. For sectors that are not location-bound, this is likely to result in investors preferring to invest in competing cities. For industries that are tied to eThekweni (e.g. Port & airport operations, major businesses where moving costs are too high, and aspects of the Freight Industry), price is an indicator of high demand relative to available supply.

## **Constraints to Land Production for Economic Uses**

The overriding constraint is the time it takes to deliver serviced land. The business expectation is that serviced land should be delivered within two years from project inception. The land production cycle in eThekweni including identification of land, planning processes & approvals, and servicing, takes 8 to 10 years. Reasons include:

- Red tape / regulations/ delays / re-active planning/ EIA's / Act 70 of 1970
- Core infrastructure costs / limited municipal finance / developers contributions / Difficulties in agreeing and coordinating contributions to core infrastructure by other spheres
- Lack of internal co-ordination between departments

The other constraints include:

- Land prices are perceived as too high
- Significant land holdings in the hands of a few owners
- Lack of clear rates incentives
- Variable investor confidence.

## **Constraints to Intensification and Redevelopment of Land for Economic Uses**

Constraints include crime & grime, lack of urban management, and lack of impetus by public entities to re-develop or upgrade of existing engineering & communications infrastructure.

## RESIDENTIAL INFRASTRUCTURE

The average residential densities of the metro as a whole are generally too low to sustain public transportation and other infrastructure, or to promote the municipal economy.

The gross municipal residential density is 4.17 to 4.24 DU per Ha d, and 55% of the municipal surface has an average residential density of 3 dwellings or less. In areas where the residential densities are significantly higher – Inanda-Ntuzuma-KwaMashu (INK) and, Umlazi and Chatsworth, Cato Manor and Berea, Durban CBD, Pinetown, Clermont and KwaDabeka – public transport is more viable. Public transport requires gross densities in order of 60-90 dwellings per Ha in order to be self-sustaining without subsidisation. EThekweni has a massive challenge to overcome since there are only a small minority of areas that come anywhere close to these densities. Densities tend to change slowly over time and therefore urgent and consistent attention needs to be given to enhancing densities in all areas and in particular within walking distance of the IRPTN.

**Urbanisation has been one of the most significant demographic and settlement trends over the past few decades.**

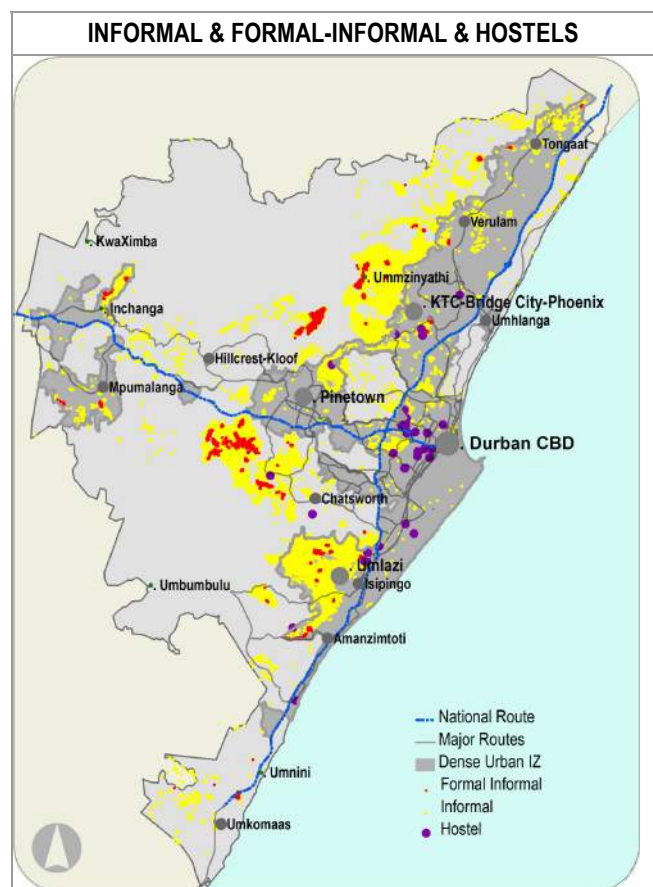
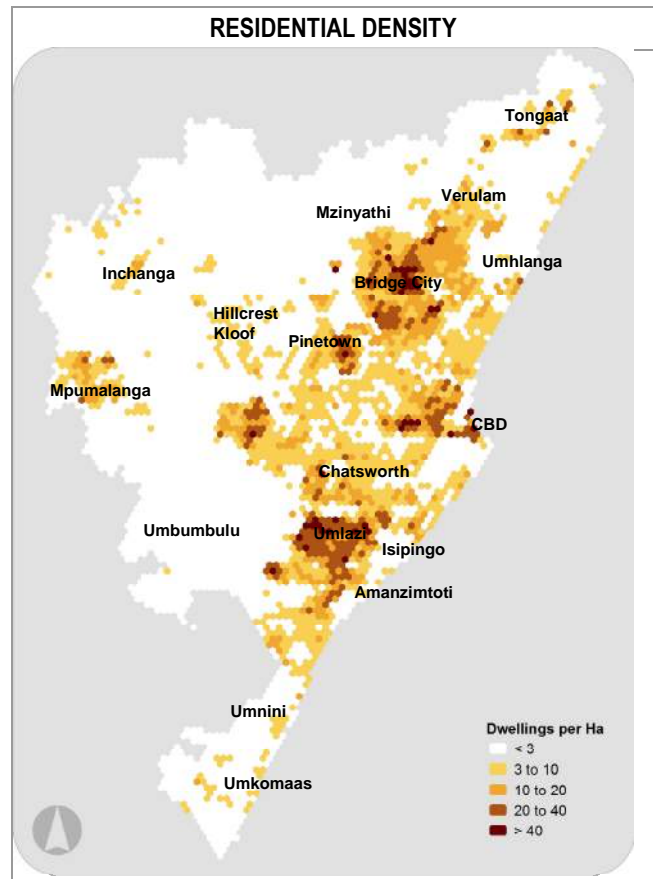
At a growth rate of 1.1% p.a., the population of eThekweni will grow to 4,4 million by 2030, an additional 775,000 people. [9] However, if global trends continue, then the 1.1% annual growth might be too low. Cities globally now accommodate 3.5 billion people or fifty percent of the worlds" population. By 2050 they will accommodate 6.4 billion people or over 70%. [10]

**There are 265,542 households, making up 27% of the City's households, in informal settlements.**

**Informal densification and extension of existing informal settlements is ongoing.**

**Hostels are a major challenge.**

EThekweni has hostels with 110 000 official



9 EThekweni City Density Strategy, May 2013  
 10 City of Melbourne, 2010

beds. An upgrading and rebuilding program has started, using funds from the Community Residential Unit (CRU) program. This program improves the living conditions of the hostel residents substantially but it is by far not sufficient for the scale of the problem and it does not integrate the hostels socially into surrounding neighbourhoods.

**The rural low-income demand is significant, and is expected to grow.**

The demand in 2011 was officially estimated at 60,182 dwellings. [11] The estimate however treats all traditional dwellings as being inadequate shelters, in contrast to the common perception that traditional homesteads are often a better shelter solution than newly-built subsidised housing, although clear incidences of inadequate shelters exist. There is not sufficient information on rural shelter to clarify the situation. For KZN as a whole the de-densification of some rural areas is likely. But this is unlikely to apply in eThekweni. Two other scenarios are more likely: continued densification of rural areas and their gradual transformation into suburban areas, and-or: the retention of rural settlements at low densities, especially where the municipality actively promotes agricultural use of the surrounding land.

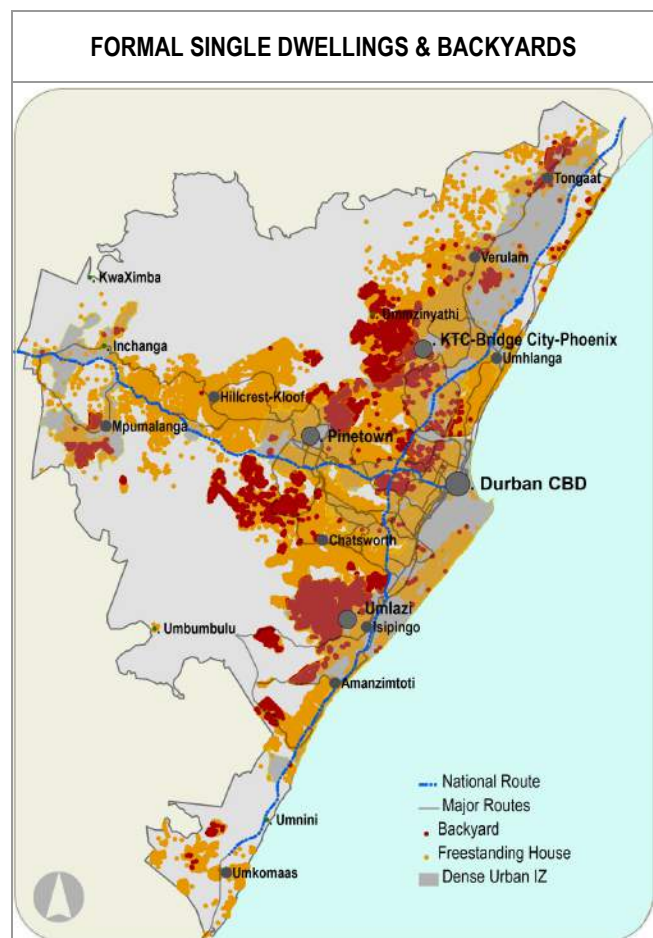
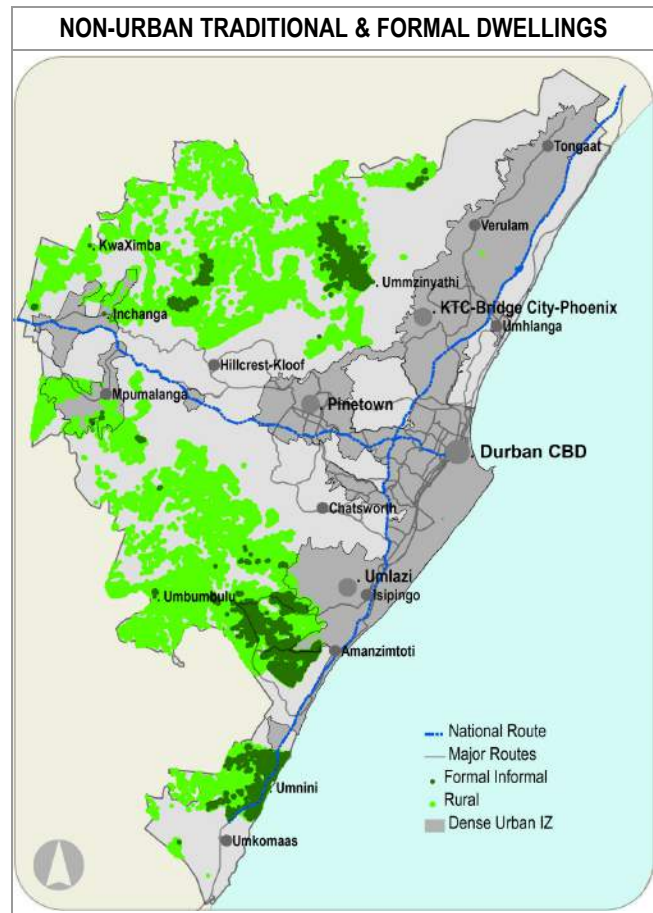
**Development of social facilities is often not aligned to greenfields housing projects.**

**Despite terrain constraints, formal housing and supporting core infrastructure is well developed and more or less continuous.**

Many suburbs are well-located relative to major movement systems, and there is a strong secondary movement network for the other suburbs

**There is a nucleus and spines of reasonably well-developed medium and higher density uses along the 'T' formed by major routes**

**The market is spontaneously providing dwellings in sufficient number, of**



11 Census 2011. Statistics SA. 2011.

**adequate quality and in the optimal locations for the upper-middle and upper income markets.**

**Formal property markets are not working efficiently for the low income and affordable housing income groups.**

One reason is that formal transfer processes are expensive and time consuming. Poor households often rely on the informal property market. The informal property market is insufficiently recognised and regulated by the state and other decision-makers. This leaves the poor exposed to exploitation.

Low-income housing tends to distort the housing market. The typical RDP house costs around R120,000 but is provided free, and consequently perceived as having a low market value. Secondly, the prevalence of subsidised housing can make it difficult for developers to differentiate a lower-market product from subsidised housing.

In addition, though the housing policy seeks to support households in the affordable market segment, affordability is significantly over-estimated, whilst the cost of delivering such housing is typically under-estimated.

**Some Bad Buildings exist in the inner city.**

Some buildings have been taken over by Social Housing Institutions (SHI) who have refurbished them as rental units.

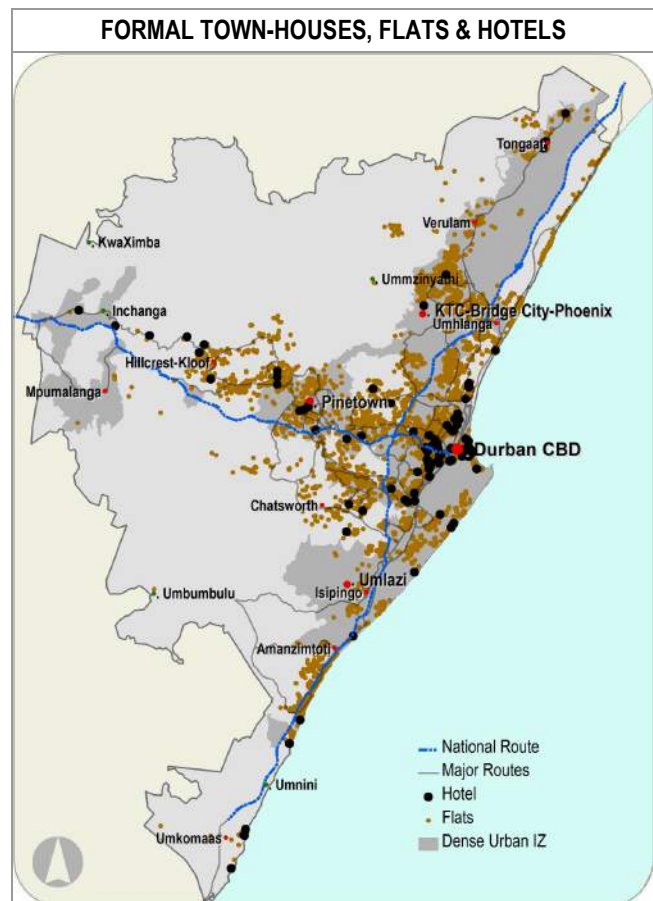
**The rental market is significant.**

It is estimated that 33% of households in eThekweni rent their accommodation. There is significant rental stock in the denser parts of the city. In suburban areas and townships, small-scale rental is prevalent, particularly in low- and middle-income areas. Backyard rental and sub-rental in existing houses are significant housing providers and have potential for expansion. Although no conclusive figures are available it is commonly held that the unmet demand is also significant in the affordable housing sub-market. The advantages of promoting rental in the suburbs are increased densities and social mix, and increased utilization of existing services and facilities. There is currently no enabling framework for this to occur.

**Housing supply is constrained in the lower and lower-middle segments.**

The formal private market is not spontaneously providing dwellings in sufficient number or of adequate quality or in the optimal locations for the poor or affordable markets. The degree to which the formal market does not penetrate the low-income sub-market is near-total.

The focus of publicly funded housing has been on supply to the low-income sub-market. The main outcomes have been free standing houses coupled with individual freehold title, transfer of state owned rental stock to tenants, and some hostel upgrades coupled with rental tenure.



**As in most SA cities, jobs are not where the people live, and vacant land for housing is not where the jobs are.**

Most jobs in the manufacturing, warehousing and transport industry are located in the centre, south and west of the municipality but a large number of workers live in the north. Vacant land for low-income settlements has predominantly been identified in the north. The long distances between residences and employment need to be addressed. The economic and residential growth axis is in the North. It has been occurring for the last decade and this momentum will increase with the development of the Greater DTP and Greater Cornubia.

**There are obstacles to densification**

Construction costs are higher per top-structure than provided for in the subsidy schemes. If units are not subsidised, then they are unaffordable for the poor and lower-middle income. The sub-markets that can afford higher density unsubsidised or partly subsidised rental or ownership stock are very small and already stable in terms of current demand and supply.

**Land acquisition for housing has distribution and acquisition challenges and opportunities**

Approximately 205,000 Ha of Ethekwini's extents are 'undeveloped' non-Forestry and Non-Agricultural land. Of this 71,000 hectares is deemed developable. Based on the need for approximately 2,000 hectares of land for greenfields projects, the low income and affordable housing market will require 3 % of the total amount of developable land in the municipality.

Most of the appropriately located land is in the North area under private ownership, and much of that in the hands of Tongaat Properties. The large holding by a single owner has contributed to a simpler land acquisition process. The impact on price of absence of competing land supply is unknown.

Vacant land also exists in the West. Land in the South is quite scarce with the remaining undeveloped land being unsuitable or too costly to develop due to the steep terrain. In Central, vacant land is limited, and what remains has already been informally settled. Central does however provide excellent opportunities for small infill development as well as the development of medium density housing projects.

Land owned by the municipality can and often has been used for housing purposes, but is usually subject to intense competition for other uses.

The processes to use land owned by other spheres of government for housing tend to be complicated and time consuming. In addition SOE's treat their land as balance sheet assets and consequently sell or let at market prices. Even at market price, acquisition of private land is often the faster option. Where there are multiple land-owners, the situation can be complex if a private treaty approach is followed. Private treaties tend to collapse if some of the unwilling owners hold out for expropriation.

**There are other significant non-technical challenges to housing delivery**

Environmental Impact Assessments rarely stop housing projects but frequently delay them, as do the procedures to release agricultural land.

Town planning requirements are principally township establishment. This often requires rezoning of the land. SPLUMA enables the municipality to carry out rezoning and township establishment in its own right without engagement with Province. The municipality would be interested to explore a streamlined town planning process, with cadaster being formally defined only for commercial and social sites and for roads, and with a less formal process for the definition of individual residential sites.

Slow repayments to eThekweni for bridging finance on subsidised projects, coupled with increasing internal resistance to availing bridging finance.

The funding portion for top-structures is insufficient for medium-density developments such as double-storey row-houses, especially if they are located on steep sites. Medium-density developments are required to implement the spatial and housing strategies of eThekweni. A top-up of approximately R 40,000 per unit is required to enable the construction of double-storey duplexes.

The housing subsidy provisions for difficult geo-technical conditions are insufficient for building on steep land and for geotechnically difficult land. A top-up of approximately R 15,000 per unit is required to enable additional earthworks, embankments, retaining, slope stabilisation, and stormwater control.

The city is gearing up capacity for dedicated project preparation.

## MOVEMENT SYSTEM

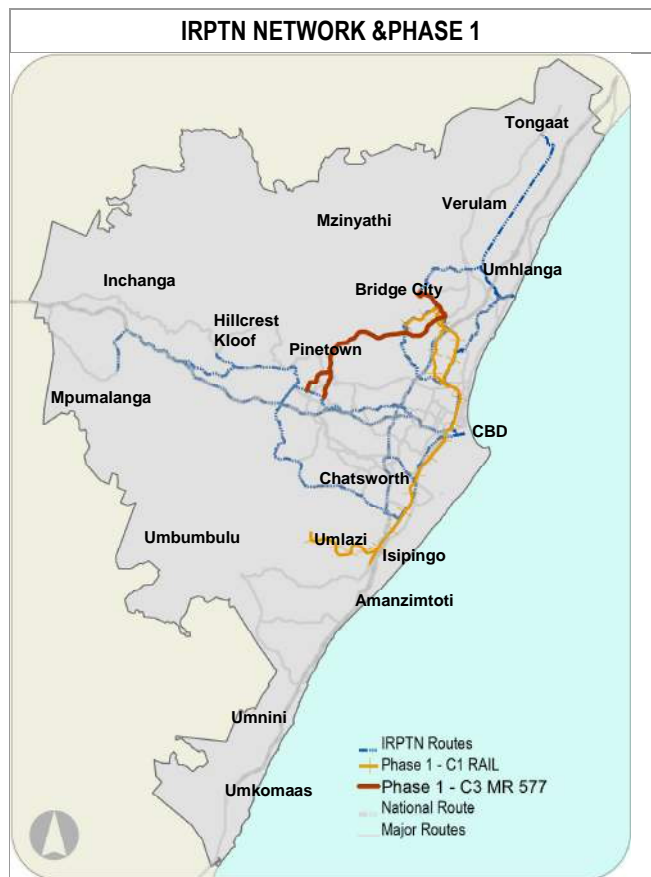
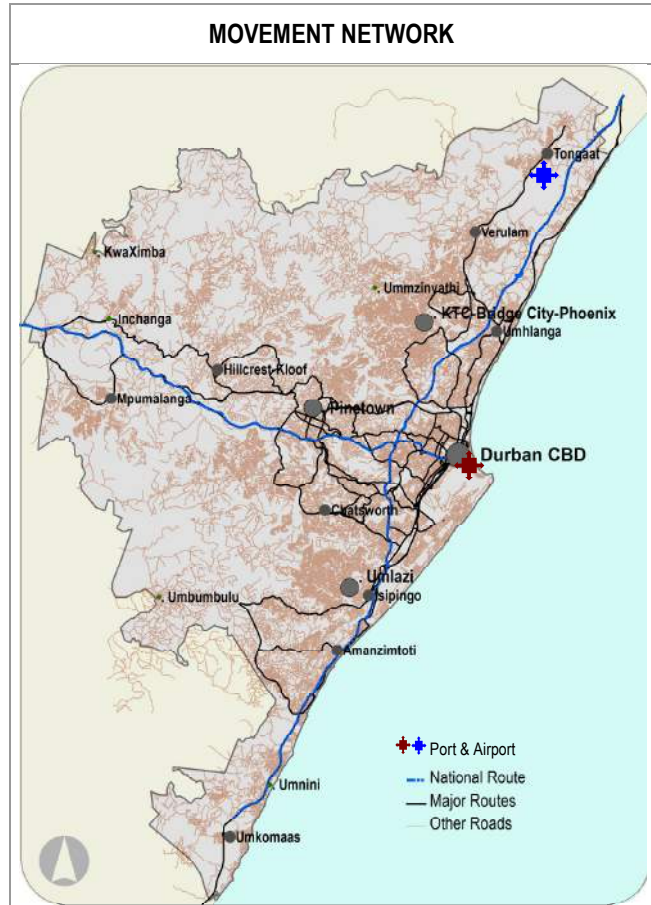
eThekweni has a well-developed port, airport, road and rail network.

The metropolitan scale movement system (National and Provincial Roads, and Arterials) is well developed and so is the local movement system Formal Urban Residential Developments and Economic Developments, but there is significant congestion in the Port and back of Port, and at key intersections on National Routes. In informal settlements and Non-Urban Locations, the movement system tends to have well-developed public transport routes and local main roads, but with 1,118 km of below-standard local roads.

## IRPTN

The IRPTN consists of North-South railway line from Bridge City to Isipingo and a number of Bus Rapid Transport (BRT) routes. It is planned that the network will have 18 transfer station ranks from rail to buses or minibus taxis

The housing section of the ITP acknowledges the close link between location of settlements and public transport, and the need for transportation input into the selection of locations for new housing projects. From a transport point of view, the





ideal locations of settlements are around BRT stops and Rail Stations. Human settlements not on trunk routes will be serviced by feeder buses or minibus taxis.

The multi-Billion first phase of the IRPTN is in implementation. One part is the C3 Road Corridor between Pinetown and Bridge City, a BRT route with BRT Stops and a major Transfer Station Rank at Bridge City. The BRT Route and Stops are under construction. The other part is the C1 Rail Corridor from Bridget City to Umlazi Station. This involves Station Upgrades, line and signalling improvements, and new rolling stock. ETA is responsible for C3, and PRASA for C1. Both projects are regarded as Catalytic Core Infrastructure Projects.

## Key Challenges

- Congestion, particularly around the Port and on key National Interchanges, is lowering economic productivity, and the important Freight sector is particularly affected.
- Congestion contributes over 50% of atmospheric emissions in cities - the highest source of pollution.
- High accident rates involving pedestrians and high numbers of fatalities increase the burden on hospitals and on medical and social services and decrease economic productivity.
- Maintenance backlogs translate to longer trip times and higher vehicle repair costs.
- Many of the poorest households live far from employment. Transport costs constitute a significant percentage of their household expenses.

## COMMUNITY SERVICES

The Access Model <sup>[12]</sup> maps the served and un-served demand for selected local and district community services of the population including informal settlements. The Model found a general trend of under-provision, with particularly low access to schooling and primary health care.

The cost of meeting the un-served demand was first calculated to be in the order of R 7.2 Bn (at current value). <sup>[13]</sup> When the constrained funding environment was taken into view, it prompted the Essential Services to be differentiated from Desirable Services, and to lower accessibility levels for Desirable Services. This reduced the requirement to R 3.4 Bn.

The process of interpreting the Access Model also identified other key issues that need resolving:

- The need for multi-MTEF spatial planning and budgeting
- Funding mandates re Fire and Libraries
- Funding commitments of other spheres
- Coordination with other spheres
- Population thresholds and space standards for Local and Regional Parks
- Management with Dept Education of school sports facilities as community facilities

ESSENTIAL FACILITIES	Accessibility		Funding Mandate		Funding Implications	
	Current	Proposed	EThekwini	Other Gov	EThekwini	Other Gov
Clinics	56%	93%	NO	YES	0	168
CHC's	56%	93%	NO	YES	0	123
Primary Schools	83%	100%	NO	YES	0	624
Secondary Schools	77%	99%	NO	YES	0	900
SAPS Police Station	?	?	NO	YES	?	0
Fire Stations	72%	85%	?	?	234	?
Libraries	70%	92%	YES	YES	129	129

12 Accessibility Mapping & Optimisation of Community Social Services In Ethekewini. Ethekewini Municipality. Prepared by CSIR. 2008. Updated 2010, 2013, 2014.

13 This figure excludes local and regional parks, for which the standards require review.

Cemeteries	-	-	YES	NO	?	0
Metro Police Station	?	?	YES	NO	?	0
<b>Subtotal</b>					<b>362</b>	<b>1,943</b>

DESIRABLE FACILITIES	Accessibility		Funding Mandate		Funding Implications	
	Current	Proposed	EThekwini	Other Gov	EThekwini	Other Gov
Sports Fields	?		YES	YES	?	0
Indoor Sports Halls	71%	98%	YES	NO	117	0
Sports Stadia	80%	95%	YES	NO	390	0
Swimming Pools	70%	80%	YES	NO	390	0
Local Parks	?	?	YES	NO	?	0
Regional Parks	?	?	YES	NO	?	0
Community Halls ABC	79%	88%	YES	NO	125	0
<b>Subtotal</b>					<b>1,021</b>	<b>0</b>
<b>TOTAL</b>					<b>1,384</b>	<b>1,943</b>

## SUSTAINABLE DEVELOPMENT

### Biodiversity

EThekwini is in the Maputaland-Pondoland-Albany global biodiversity hotspot i.e. an area of high species richness that is also under considerable threat.

### Climate Change

A recent World Bank study estimated the global cost of climate change adaptation at US\$ 70–100 Bn p.a. The Global South is likely to carry 80% of this because it will suffer earlier damage than the Global North. Southern cities require a break from the status quo to minimise future damage and limit adaptation costs. EThekwini will prioritise eco-system based adaptation because it is more cost-effective than other adaptation approaches.

EThekwini has made some progress to limit the loss of natural areas by using instruments such as proclamation of protected areas, conservation zoning, conservation servitudes controlled development areas, environmental special rating areas, and land acquisition. Natural asset-management improvements have been initiated, including active reforestation of certain open spaces (e.g. the Buffer Zone surrounding the Buffelsdraai Landfill Site), and through the Working for Fire and Working for Ecosystems programs. 14% of the D'MOSS area is protected, and another 12% is managed, and it is intended to upscale this. Up-scaling is a challenge considering capacity challenges, and the rapid urbanisation and transformation taking place to meet development and service delivery goals.

### Free Eco-System Services

Green infrastructure provides the environmental stability, clean air, water, stormwater control and more, <sup>[14]</sup> and is part of the basis of human well-being. The value of free environmental services is estimated to be equivalent to 17% of the Operating Budget. Green infrastructure informed the design of the Durban Metropolitan Open Space System (D'MOSS).

### Bio-diversity loss

<sup>14</sup> Gas Regulation, Climate Regulation, Disturbance Regulation, Water Regulation, Water Supply, Erosion Control, Soil Formation, Nutrient Cycling, Waste Treatment, Pollination, Biological Control, Refugia, Food Production, Natural Products, Genetic Resources, Recreation & Cultural Resources



## CORE INFRASTRUCTURE

### Piped Water Network

The piped water network is comprehensive in urban locations, and there is a high penetration of Non-Urban locations. There is a significant void in the network in the Greater Cornubia and in the Greater DTP & Surrounds, and which requires to be filled to enable the City's development intentions. The majority of the un-served demand for residential water connections is in informal settlements, although the local reticulation exists to which to connect. The City experiences high levels of non-revenue water loss, caused mainly by illegal connections in townships and informal settlements.

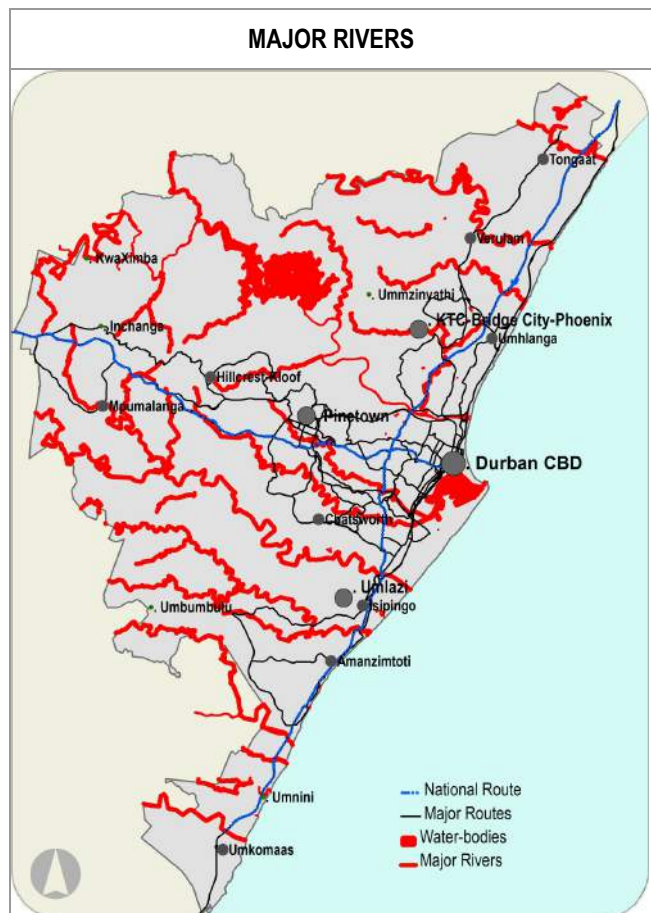
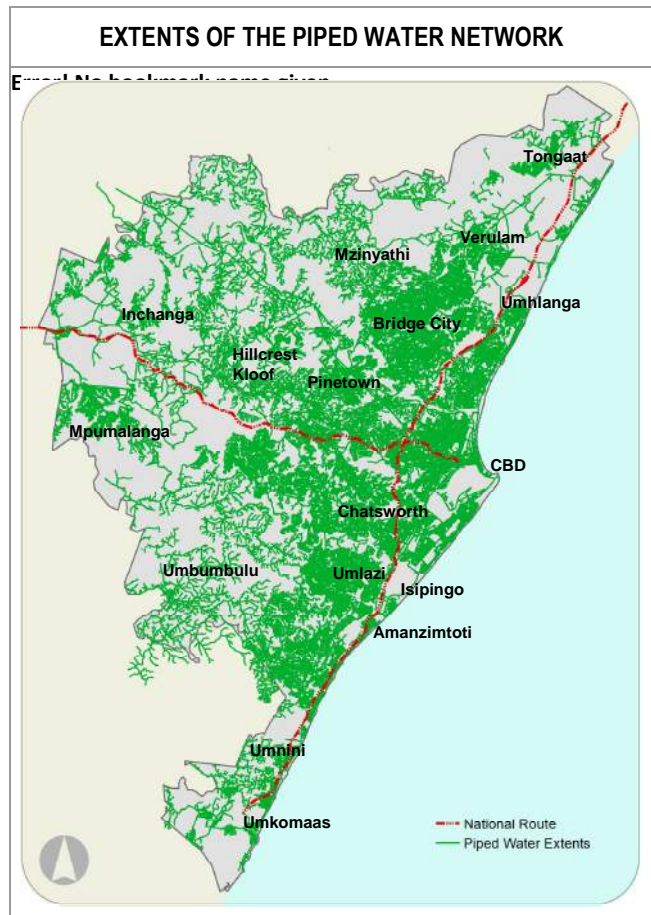
### Raw Water Supply

There is insufficient raw water supply to deal with the further development as envisaged in the SDF and SDP's, even with the Spring Grove Dam now being complete. A medium- to long-term option is the construction of a dam on the Mkomazi River, and interactions are in progress between Umgeni Water and eThekweni on the. Issues to be resolved include what the funding plan, and the possible impact and management of water tariffs.

There is a further problem in that the level of assurance of the Umgeni System is above 95% is still less than 99%. This creates some risk of water restrictions in low rainfall periods in some years to come, and which years will reduce economic output, reduce effectiveness of social services, and reduce residential amenity.

### Alternative Supply, Loss Limitation, and Demand Management

In addition to augmenting the raw water supply, other interventions in supply and demand are under consideration. Water recycling may, if all the approvals are received, come on stream in the medium-term. More efficient utilisation of the existing resource is the short-term priority, particularly limiting water losses through theft and leaks. Desalination is also under consideration, and a feasibility study is in progress.



## Water Supply Reconciliation Strategy Study for the KZN Coastal Metropolitan Area

The objective of this DWA study is to identify, evaluate, and prioritise interventions to reconcile the water requirements with the available water resources up to the year 2030. The study area is from Pietermaritzburg in the west to Durban and from KwaDukuza in the north to Amanzimtoti in the south. It includes the eThekweni Metropolitan and Msunduzi and Ilembe Municipalities.

### River Classes

Related to the Reconciliation Strategy is an exercise by DWA to classify the rivers in the KZN Coastal Metropolitan Area. The Classes, once gazetted, will set what can be extracted from them, what can be discharged into them, and how must be managed environmentally. The exercise has a strong emphasis on environmental considerations, and in upgrading of rivers. High-level interactions are in progress between DWA and eThekweni on how to modify the exercise to take into greater consideration the future growth of the City, and also the cost and technology implications of the infrastructure needed to sustain the River Classes.

### Wastewater Treatment Works

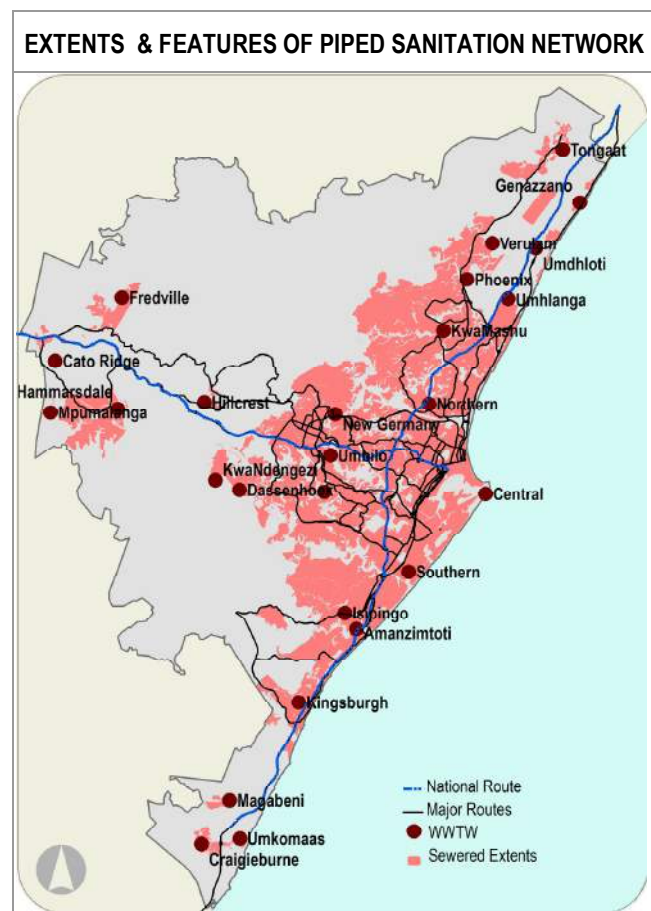
There is some urgency to upgrade existing and build new WWTW's, particularly in the North. Obtaining approvals for doing so is linked to the finalisation of the River Classes exercise, and to obtaining Water Use Licences, and currently these are delay factors that need to be considered and where possible mitigated.

### Water Use Licences

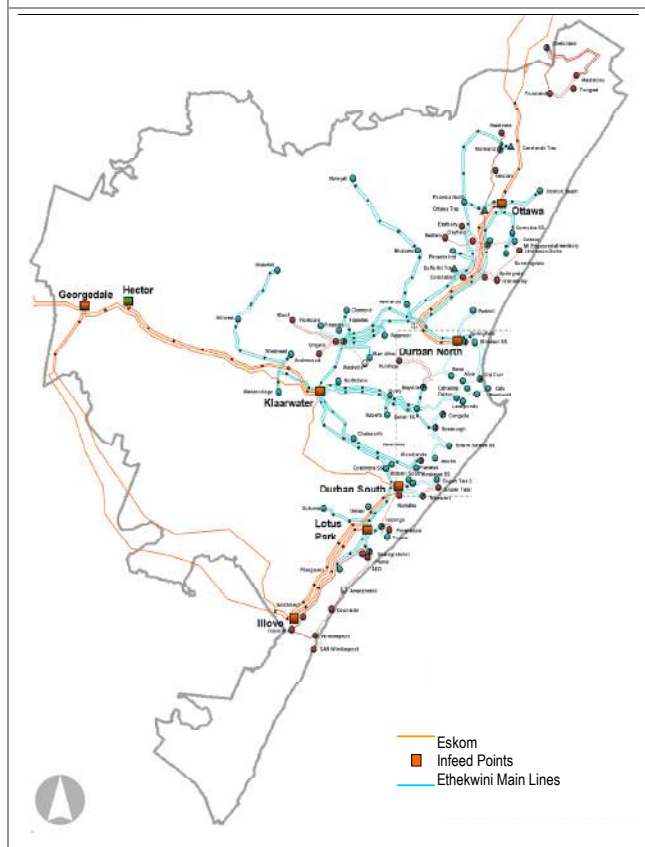
A Water Use Licence from DWA is required to upgrade existing sewerage treatment works and to build new ones. Before a license application is assessed, the ecological reserve of any affected water resource must be established. Although the ecological reserve determination studies have been completed and submitted for a number of the eThekweni estuaries, these studies have not been finalised by DWA. However, it already seems to be clear from a sewerage planning perspective that, if the intentions of the ecological reserve process are to be met, and the current land uses in the SDPs remains unchanged, a combination of direct re-use of treated sewage effluent for potable water supply, some quite extensive cross-catchment pumping, and-or sea outfall will have to form the basis of future sewerage planning.

### Existing Sewer Infrastructure

The network of WWTW and Trunk Mains is well-developed within the Central and North Sub- Metropolises. As with Water, there is a significant void in the network in the Greater Cornubia and the Greater DTP & Surrounds, as well as some constraints in the Shongweni and Hammarsdale locations. These voids require to be filled to enable the City's development intentions.



### MAJOR ELEMENTS OF THE ELECTRICAL NETWORK



### Bulk Electricity Supply

eThekweni’s electrical networks have sufficient bulk capacity, with localised constraints in the Westmead, Springfield, and Assagay-Shongweni. Plans are in place to rectify these by 2023. The 20-year load forecasts are being revised and will then be used to update the 2011 Masterplan, an exercise that is scheduled for completion in 2016.

### Eskom Supply Challenge

The interrupted bulk supply through Eskom’s load-shedding, which was recently announced as being likely to end only in 2018, is a significant impediment to development, and particularly for Economic Development.

### Alternative Energy Sources

In line with Green Economy objectives, the City is rolling out the methane harvesting on recently closed landfill sites, and has begun investigations into:

- The feasibility of a Peak Power Gas Turbine Electrical Generation Plant. The Gas Turbine would kick in during load-shedding, to eliminate the impact of load-shedding on commercial users and other large clients (such as hospitals and tertiary institutions)
- The generation potential of photovoltaic arrays on land-fill sites where methane levels have fallen to below being feasible for harvesting
- The generation potential of a range of hydro-turbine projects at reservoir inlets and outlets

### Current Service Delivery to Existing Residential Uses

Service	% of eThekweni households served at applicable Service Standards	
Water	92.23	%
Sanitation	76.05	%
Solid Waste Removal	100.00	%
Electrical Connection	66.40	%

There is a Service Standard for each main typology of residential development.

- Rural service standards: One ground tank per household supplied with 300 L per day; Urine diversion toilet; Electrification only of densely clustered pockets; All weather surface to all public transport routes within communities having a density greater than 15 persons per Ha
- Informal Settlement standards: Communal ablution blocks (toilets and showers) within 200m of served households; High mast lighting for security; Prepaid electrical connections <sup>[15]</sup>; Access roads for waste removal, fire and emergency vehicles.
- Formal Urban service standards: Semi pressure water house connections; Waterborne sanitation; Metered electricity connections; All weather surface roads.

15 The above map shows the demand for household connections to formal households only. In addition, there is extensive demand arising from the policy decision to electrify informal settlements as well



## IMPACTS OF TRENDS, DEMANDS & FEATURES

TRENDS & FEATURES (SORTED IN DESCENDING ORDER FROM HIGHEST NO. OF POSITIVE IMPACTS)	ECONOMIC & SOCIAL IMPACTS				
	SPATIAL IMPACTS			Prosperity	Inclusivity
	Connectivity	Efficiency	Density		
Well-developed port & airport, movement & communication systems	Y	Y	Y	Y	Y
Catalytic Greater Cornubia, Greater DTP, Keystone in implementation	Y	Y	Y	Y	Y
Phase 1 IRPTN (i.e. C3 MR 577 and C1 Rail) under construction	Y	Y	Y	Y	Y
Nucleus and spines of medium & higher density residential	Y	Y	Y	Y	Y
Western & Northern Aqueducts under construction	0	Y	Y	Y	0
Apparently keen interest in industrial land production in new locations	0	Y	?	Y	Y
Extensive eco-system	0	Y	Y	Y	0
Sufficient supply, in ok locations, of middle & upper income residential	0	Y	Y	Y	?
High incidence of informal settlements in & near low income suburbs	Y	Y	Y	X	X
Gateway-city for trade and travel	Y	0	0	Y	0
Strong local economy, especially freight, manufacturing, trade, finance	0	0	0	Y	Y
Rapid pace of communal ablution block construction in informal settlements	0	0	0	Y	Y
Urbanisation, mainly by the poor, mainly into informal settlements	0	?	Y	?	?
Increasing un-serviced formal non-urban housing next to urban uses	0	X	X	Y	0
Significant and growing non-urban residential demand	?	X	X	Y	?
Congestion in Port & BoP, and at key intersections on National Routes.	0	X	0	X	0
Bio-diversity loss	0	X	?	X	0
Shortage of skilled and semi-skilled labour	0	X	0	X	X
Unreliable electricity supply	0	X	X	X	0
Constraint in raw water supply	0	X	X	X	0
Significant basic residential services backlogs for informal settlements	X	0	0	X	X
Except ablution blocks, slow addressing of basic res. services backlogs	X	0	0	X	X
WUL's not to hand to support growth in key areas	0	X	X	X	0
Fallow industrial land	0	X	X	X	X
Long time-frames to approve and service industrial land	0	X	X	X	X
Development of social facilities not aligned to housing projects	X	X	0	X	X
Significant community services backlogs	X	X	?	X	X
Lack of IG planning and budget co-ordination	X	X	X	0	X
Segregated-use city	X	X	X	X	X
Low-density city	X	X	X	X	X
Low-income city	X	X	X	X	X
Commuter-city for low income communities	X	X	X	X	X
Under-developed ICT networks	X	X	X	X	X
Insufficient capital available to municipality	X	X	X	X	X

The trend / feature inhibits (X) promotes (Y), has unclear, unknown, or mixed impact (?), or does nothing positive (0)