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1. PROJECT OVERVIEW

1.1. PURPOSE OF THE BUSINESS PLAN

The eThekwini Municipality is committed to the spatial restructuring of its city form and the improved utilisation of public transport systems. To this end the Municipality adopted a Densification Strategy in 2012.

With the adoption of the Densification Strategy the City committed itself to lead processes aimed at the densification of key city corridors, not only through strategic and land use management planning, but also through becoming actively involved in the implementation of development projects aimed at urban restructuring and densification.

This Business Plan presents the Business Case for a project aimed at densification the South Public Transport Corridor of the eThekwini Municipality. The project is referred to as the Clairwood Transport Orientated Development (TOD).

The Business Plan is one of three Business Plans aimed at finding suitable partners, private and / or public sector, for the implementation of densification initiatives on sites located in the Southern Public Transport Corridor.

It must be noted that the Business Plans are based on Concept Designs and, therefore, certain assumptions and costing will have to be reviewed once detailed architectural designs have been commissioned by the Developer.

1.2. OVERVIEW OF THE PROJECT CONCEPT

The proposed project is for the development of at least 329 high density residential units in the Clairwood area of Central eThekwini catering for the lower middle income market. The project is located on the IRPTN Network and bounded by three major traffic movement routes, viz. South Coast Road, an important high volume mobility route serving the municipality to the south of the CBD, Kenyon Howden, an east-west mobility route and, Roland Chapman Drive/ Halifax Road a north-south route providing mobility locally. It is also located in close proximity to a BRT station proposed for South Coast Road.

The project will be aimed at accommodating both public and private sector workers. This will relieve the current high pressure for suitable accommodation in areas such as the Durban CBD, Montclair and Umlazi.

The primary planning and design objectives for the site is to provide maximum residential thresholds with complimentary mixed use/ retail in closed proximity to eThekwini’s IRPTN system. The proposal compliments the existing character of the area which consists of medium density residential clusters.
1.3. PROJECT PACKAGING APPROACH

The approach adopted to the packaging of this densification pilot project business case included the following steps as proposed in the Implementation Plan for the Densification of the Southern Public Transport Corridor (eThekwini 2014). The approach included the following steps:

- Step 1: Project Identification
- Step 2: Land Assembly
- Step 3: Preliminary Assessment
- Step 4: Concept Development and Assessment
- Step 5: Recommendations

1.4. CONTENTS OF BUSINESS PLAN

This Business Case document presents:

- A project concept;
- The context within which it will be developed;
- A planning motivation;
- An environmental assessment;
- A transport and engineering concept; as well as
- Budget and development proposals.
2. CONTEXT – SPTC CORRIDOR FRAMEWORK PLAN

2.1. INTRODUCTION

The basis for this Pilot Project Business Plan is the Densification Framework developed for the Southern Transport Corridor of eThekwini (eThekwini 2014). This section provides an overview of the Densification Framework developed for the Corridor focusing on:

- the objectives of the initiative;
- the understanding of the proposed sustainable densities developed;
- the corridor vision developed;
- the sub-corridor visions developed;
- the translation of the visions into a land use management framework; and
- the identification and prioritisation of pilot projects.

For more detailed information the various phase reports for this initiative should be studied in more detail.

2.2. THE SPTC DENSIFICATION INITIATIVE

The Study Area for this initiative the Clairwood area of the Southern Public Transport Corridor.

Densification and intensification is not new to the Southern Public Transport Corridor, but has been occurring over a number of decades through informal housing development, higher density residential developments, the provision of public facilities and the intensification of economic activity along the length of the corridor.

The City has prepared a Densification Strategy that suggests that densities of more than 80 housing units per hectare should be promoted in nodes linked to the Southern Public Transport Corridor. This SPTC Corridor Framework confirmed through detailed planning assessment and proposals:

- That this level of density (i.e. 80 hectares per unit) can be achieved in the Southern Public Transport Corridor; and
- How this level of density can be achieved in the corridor.

The key objective of the Southern Corridor Framework initiative, as per the Terms of Reference, was to develop a comprehensive densification framework for the corridor and adjacent suburb. The Densification Framework had to:

- Identify areas suitable for densification within the road and rail corridor and adjacent suburbs;
- Determine the densification alternatives (infill, intensification and urban renewal) appropriate to each corridor and relevant neighborhoods and nodes;
2.3. THE SPTC DENSIFICATION FRAMEWORK

The Land Use Framework Report detailed the population projections within the corridor as well as the sustainable thresholds for urban areas and public transport. Each of the sectors provide sustainable thresholds for either a sustainable community or sustainable public transport. The question remained what are the likely densities for the study area factoring in the proposed future growth?

The numbers used to calculate and determine what constitutes a ‘sustainable corridor’, have been generated from various assessments in the Densification Land Use Framework Report including:

- The population numbers associated with the corridor in terms of the population census data (the population numbers were generated as per the planning units and not the project area boundary).
- The requirements from a transport point of view for a sustainable public transport system (an average was determined between low and medium income population over two modes of transport – BRT and Train, which is specific to the Southern corridor).
- The elements and densities required for a sustainable urban area.
- ‘Types of Densification’

The development of a sustainable and efficient Southern Public Transport Corridor is determined by the following factors:

- Total corridor areas = 1 582 hectares;
- Total number of households in associated planning units by 2030 = 175 000;
- For the corridor to be viable it has been assumed that the highest concentration of people should be located within the corridor. As it is not possible to relocate the existing settlement it has been proposed that calculations must be based on 50% of new growth and development to 2030 should be concentrated within the corridor boundary. The remaining 50% should be located along the feeder routes.
As per the above;

- 175,000 is the total number of households expected to live within the Southern Public Transport Corridor area by 2030;
- An increase of approximately 51,000 households is estimated for 2030 within the planning units that make up the Southern Public Transport Corridor;
- 50% of the expected increase is 25,500 households, the number that should ideally be located within the corridor boundary;

Based on the above, the anticipated increase in density in the corridor is calculated as follows:

- 25,500 households / 1582 hectares = 16 du/ha overall density increase (all land, including undeveloped);
- 16 du/ha x 2 = 32 du/ha gross density increase (identifying residential and associated land only);
- A factor of 1.25 if used to calculate net density (1.25 is the difference between gross and net), therefore the net density is a minimum of 40 du/ha increase, to the existing residential density.

The assessment illustrated and emphasized that to generate a sustainable corridor we do not require densities of 150+ du/ha, (gross) but a sustainable community requires a gross density of 24 du/ha. Likewise, sustainable public transport for this corridor can run efficiently at 41 du/ha.

The densities required are therefore not unachievably, it is about creating sustainable communities serviced by public transport in the correct locations.

Densification requires the collaboration between a diverse set of variables, such as the development of sustainable communities, the reliability on sustainable public transport, infrastructure provisions, government backing and policy, to name a few, to guide the process appropriately. The approach requires policy makers and decision makers in the City to unite, consolidate resources and adopt a ‘big bang’ approach for the development and implementation of this strategy.

Spatial planning should not be prescribed by infrastructure limitations and policy led decision-making. Spatial planning needs to escape the existing planning vortex and be driven by an action led agenda.

Densification is also greater than one principle or application of policy, it needs to be embedded within a wider city argument of creating a “Sustainable City”.

This will require a fundamental shift and change to the current planning approach adopted currently. It will require the support of a ‘Bigger Plan’.

The proposed vision and proposed densities identified in the above form part of a detailed study and position paper prepared. It is not a leap of faith, rather the implementation of a clear plan and vision prepared with insight from the Curitiba case study. Adopting this wider development vision and cohering various initiatives will assist in creating the sustainable city outlined.

This Business Case for the development of the Clairwood TOD is a basic starting point for illustrating to the general public and the private sector that densification can work.
2.4. THE CORRIDOR SPATIAL VISION

The Study Area refers to the Southern portion of the eThekwini Municipality, specifically the South Durban Basin. The project study area extends from the Durban CBD to Isipingo and inland to Umlazi along the Mangosuthu Highway. The major components of the vision for the development of the area are reflected on below.

- **STRUCTURING ELEMENTS**: Major structuring elements along the eThekwini Municipality south coast is the national mobility route, the N2 as well as the M4 highway. The N2 provides the only direct north/ south link between KwaZulu-Natal and the Eastern Cape. The N2 and M4 provide the basic structure for the Southern Public Transport Corridor.

- **MAJOR INTERVENTIONS**: A second major structuring element along the eThekwini Municipality south coast is the Port of Durban and the entire Back of Port zone. The future redevelopment and expansion of the existing Durban Harbour as well as the introduction of the Dig-Out Port, at the old Airport site, will have major restructuring emphasis on the southern corridor.

- **IRPTN AND RAIL**: The introduction of the IRPTN system (both rail and road) establishes meaningful connections from the in-land suburbs to the main line N2 and M4 corridor, connecting the hinterland to the CBD.

- **COMPLEMENTARY AND FEEDER ROUTES**: The main IRPTN rail and road network is accompanied by a series of complementary and feeder routes. These routes provide an intricate web throughout the suburbs connecting the inner suburbs to the main IRPTN stations and routes.

- **GREEN INFRASTRUCTURE**: Creating a meaningful network will enhance and restore the open space system within the Southern Public Transport Corridor as well as the Durban CBD as a whole, and uplift the existing environmental condition of the South Durban Basin area.

2.5. THE SUB-CORRIDOR VISIONS

A clear and distinct densification vision was developed for each of the sub-corridors forming part of the Southern Public Transport Corridor.

**UMBILO SUB-CORRIDOR - CBD EXTENSION, REDEVELOPMENT ACTIVITY CORRIDOR**

It is envisaged that the Umbilo sub-corridor becomes an extension of the existing CBD. The redevelopment of the Umbilo strip will allow for a powerful, mixed use, high density activity corridor.

**CLAIRWOOD /MERE_BANK SUB-CORRIDOR – LOGISTICS HUB**

The Clairwood sub-corridor presents opportunities for urban renewal with a focus on high quality business and logistics hub. The Clairwood area is a strategic sub-corridor as it is the convergence for three IRPTN corridors – the C2, C4 and C5 corridors.

This sub-corridor also presents two unit opportunities to develop two full TOD type development around the Clairwood and Montclair stations.

**ISIPINGO /REUNION SUB-CORRIDOR – HIGH QUALITY BUSINESS AREA**

The Isipingo sub-corridor will see significant change with the development of the Dig-Out Port. In response to the Dig-Out Port the Isipingo zone will provide a strong commercial and high quality business precinct.

**UMLAZI SUB-CORRIDOR – POWERFUL DENSITIES**

The Umlazi corridor will consist of the highest residential densities within the Southern Public Transport Corridor. The area is primarily residential in nature, however the plan envisages a high density residential corridor consisting of no informal settlements and clusters of high intensity mixed uses nodes located at strategic points within the sub-corridor.
2.6. THE PILOT PROJECT SHORT LIST

In the period February to April 2014, a number of potential opportunities for densification projects were identified through engagement with various eThekwini Departments (most notably eThekwini Transport Authority and Housing) and the Project Steering Committee, as well as based on the extensive assessments undertaken by the Team in previous phases.

Through this process, a number of potential densification opportunities were identified and presented to stakeholders initially in the Land Use Framework. The opportunities identified included:

- Umbilo Corridor
- King Edward Node
- Rosshburgh Station
- Clairwood TOD
- Clairwood South
- Reunion TOD
- Isipingo TOD
- Umlazi W Section
- Lindokuhle
- Umlazi Housing

2.7. PROJECT SELECTION

The assessment of projects was key to the process as the most significant and feasible opportunities had to be selected. The basic criteria used in the selection process was:

- Accessibility of the Site;
- Land Availability and Ownership;
- Densification Opportunity Offered (Extent and Relevance); and
- Intensification Opportunities.
- The cost of the land (if not Council owned);
- The current zoning and development parameters;
- The market to be targeted with the development of a specific site.

Based on this, the Pilot projects selected were:

- The King Edward Residential Precinct;
- The Clairwood Transport Orientated Development (TOD);
- The Umlazi Affordable Accommodation initiative; and
- The Umlazi Housing Income Generation project.
DIAGRAM 2.1: TRANSLATING THE VISION INTO A SPATIAL FRAMEWORK / LUMS GUIDELINES (PILOT PROJECT LOCATION)
3. THE LAND

3.1. INTRODUCTION

The proposed Clairwood TOD is located in Clairwood, Central eThekwini. This section provides an overview of the land identified for the proposed development specifically considering:

- Location;
- Site Description;
- Ownership;
- Current and Neighbouring Land Use;
- Zoning;
- The Corridor in which it is located.

3.2. LOCATION

The site is located in the Clairwood area of Central eThekwini. It is on the IRPTN Network and bounded by three major traffic movement routes, viz. South Coast Road, an important high volume mobility route serving the municipality to the south of the CBD, Kenyon Howden, an east-west mobility route and, Roland Chapman Drive/ Halifax Road a north-south route providing mobility locally. It is also located in close proximity to a BRT station proposed for South Coast Road.

3.3. SITE DESCRIPTION

3.3.1. OVERVIEW

The Site in Clairwood South is referred to as:

- Erf: 1068, Sea View
- Address: South Coast Road

The Site is 3.8 hectares in size.

IMAGE 3.1: INTERSECTION OF KENYON HOWDEN AND SOUTH COAST ROAD
3.3.2. OWNERSHIP AND VALUE

The following information is available relating to the ownership of the site:

- Ownership: eThekwini
- Municipal Valuation: R2 350 000 (2012)

3.3.3. CURRENT USE

Public open space. Discussion regarding the making available of this site for development has been initiated with the Department of Parks and Recreation currently responsible for managing the public open space.

3.3.4. ZONING

The site is currently zoned as public open space, but only a small portion is actively used for this purpose.

3.4. THE SITE IN THE CORRIDOR

3.4.1. LAND USE IN THE CORRIDOR

The Clairwood/ Merebank sub-corridor is an extension of the Umbilo/ Congella sub-corridor, therefore containing similar attributes such as the industrial and commercial activities. The sub-corridor contains four pieces of state own land as well as three substantial residential pockets.

The three residential neighbourhoods are well located in relation to the rail stations, presenting possible opportunities zones for redevelopment in terms of densification, intensification or TOD type development.

3.4.2. ZONING IN THE CORRIDOR

The current zoning in the corridor is reflected on in the table below.

<table>
<thead>
<tr>
<th>Current Zoning (Primary Zones)</th>
<th>Basic Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Industry</td>
<td>This Precinct comprises the Clairwood area comprises the shopping and industrial area linear strip of South Coast Road. The main section of Clairwood area is currently zoned Special Residential 400, which the BOP study proposes to become largely a Logistics zone. On either side of South Coast Road is a strip of General Commercial zoning. On either side of this linear strip are General Industrial Zones. On either side of railway on the western side of this precinct is a Transportation zone.</td>
</tr>
<tr>
<td>General Commercial</td>
<td></td>
</tr>
<tr>
<td>Special Residential 400</td>
<td></td>
</tr>
<tr>
<td>Special Residential 900</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td></td>
</tr>
</tbody>
</table>
DIAGRAM 3.1: CURRENT ZONING IN THE CORRIDOR
4. PROJECT CONCEPT / PLAN

4.1. DEVELOPMENT RATIONALE

The Clairwood sub-corridor presents opportunities for urban renewal with a focus on creating a high quality business and logistics hub adjacent to the proposed Dig-Out Port. The high quality business and logistics hub would provide an anchor between the Durban CBD, the mixed use CBD extension and the Dig-Out Port.

The Clairwood area is a strategic sub-corridor within the Durban South region, as it is the location for the convergence for three IRPTN corridors – the C2, C4 and C5 corridors. This sub-corridor also presents two opportunities to develop two full TOD type development around the Clairwood and Montclair stations.

The TOD detailed in this report has been termed the ‘Clairwood South TOD’, which is located adjacent to the Montclair rail station along Roland Chapman Drive and South Coast Road.

The primary planning and design objectives for the site is to provide maximum residential thresholds with complimentary mixed use retail in closed proximity to eThekwini’s IRPTN system. The proposal compliments the existing character of the area which consists of medium density residential clusters.

The identified site is currently used as sports facilities for the local community. The site however, is isolated by two priority roads therefore limiting access. The location of the site also presents security risks due to the limited access, both physically and visually.

Despite the current use of the site solely for recreational purposes, a portion of the proposed development has been identified for recreational use – combi courts, playgrounds as well as general open space. Maintaining open and recreational space within the design is critical to the success of a TOD or high density living.

As stated the TOD is designed to promote mixed use activities that are compatible with high density residential living. The residential cluster should promote densities in excess of 80 du/ha. This will allow for the development of sustainable communities and a sustainable transport system, as identified in the main vision and concept report. Densities of 80 du/ha and above will promote more effective and livable space. Neighbourhoods with densities lower than 80 du/ha will need to compromise on the quality of service received due to the fall in demand, for example, the headways between buses will be greater as there will be less passengers to cater for.

The proposals for the Clairwood TOD, falls in line with the above objectives, as well as the primary design intentions;

- To identify area suitable for densification within the road and rail corridor as well as adjacent suburbs;
- To identify specific segments, blocks, nodes and site specific constraints and proposals to reduce constraints to enhance densification opportunities; and
- To determine densification alternatives.
4.2. DESIGN CONCEPT

SITE CADASTRAL
The Clairwood South Precinct is located between three major road systems; South Coast Road, Kenyon Howden Road and Roland Chapman Drive. The site is divided into four components each with a specific design and function.

LAND USE
The primary land use of this precinct is residential as a result of increased pressure from municipal led policies and projects. Sites two, three and four provide the residential threshold, while site one and portions of three are retain for recreational purposes. Site two also provides limited ground floor commercial opportunities in support of the adjacent IRPTN station and surrounding residential neighbourhoods and businesses.

MOVEMENT AND CIRCULATION
The access points provided for the site have been restricted to one off Kenyon Howden Road and three along Roland Chapman Drive. Due to the location and nature of the site access has been limited to these points. Roland Chapman Drive facilitates the greater access points due to it being a lower order and is in line with the existing nature of the street. On site circulation is limited, with a single thoroughfare in division two. Divisions three and four have a single entry and exist point for the facilities they maintain.

BUILT FORM
The units on site range from four to six stories in height. The units are orientated onto the public environment and provide a human scale to the precinct with balconies providing maximum surveillance to the precinct, surrounding neighbourhoods, businesses and IRPTN station.

LANDSCAPING
The greening and landscaping of the site plays an integral component to the precinct, particularly due to the fact that the site is currently used for recreational purposes. The internal sports fields and parks provide relief within the high density residential cluster allowing all residents access to open space and recreational amenities. Landscaping along the street edge provides protection from the elements while engaging with the external precinct facilities.
4.3. DESIGN CONSIDERATIONS & SITE DEVELOPMENT PLAN

The Clairwood South Precinct is designed to provide a small TOD (Transit Oriented Development) along the eThekwini IRPTN route. In order to align with the findings of this study the precinct requires a minimum of 81 du/ha to support a sustainable neighbourhood, sustainable public transport and to facilitate the anticipated future growth along the corridor of an increased 41 du/ha.

Therefore, the precinct is design to allow for maximum residential thresholds within an existing residential neighbourhood, however at the same time retain a portion of the existing sport and recreational facilities currently utilised on site.

The proposed site is earmarked as a small TOD, providing services and uses designed to support a transport orientated node. Therefore, catering for this specific market requires the site to consist of high density residential units, supported by a small range of commercial facilities.

The residential components of this site are divided into three distinct clusters, in sites two, three and four. Each block within site two and three ranges from 4 to 6 stories in height, while the blocks in site four are four stories in height.
The units within the blocks consist of bachelor and two bedroom flats. The unit designs for the Clairwood South Precinct is designed to cater for middle and lower income users.

A core aspect to the precinct is the sports field and associated facilities. The site is currently used as a training facility and therefore these activities should be retained and existing facilities upgraded.

The inclusion of a residential cluster around the sports facility ensures a safer environment for those utilising the facilities, as well as the residents whom will live there as there will be 24 hour surveillance within the precinct.

The residential blocks are designed to provide a human scale to the precinct and surveillance to surrounding facilities through the design of apartments with open balconies. Therefore addressing the current security issues, present at the existing facilities.

The design of the precinct also provides increased security and surveillance to South Coast Road and Roland Chapman Drive interfaces. An IRPTN station is proposed south of the Kenyon Howden and South Coast Road intersection, therefore increased pedestrian movement and circulation around the node is expected. As a result the precinct has been designed to facilitate additional pedestrian traffic from the IRPTN station with pedestrian crossings and a plaza in front of the retail facilities within the precinct. with additional choice and accessibility to the greater eThekwini region.

The ground floor retail/commercial facilities envisaged for the site should provide support to the adjacent IRPTN station and the commuters. The facilities should however be of greater benefit to the surrounding residential neighbourhood such as a local convenience store.

Access and parking to the retail facilities are located off Kenyon Howden Road. Access and parking provision for the remainder of the site is associated with the respective residential block.

Parking provision for the precinct allows one parking bay per unit. The parking reservoirs could be reduced overtime as the IRPTN system become fully operational and residents choose to make use of the system fully instead of private vehicles. Unused parking lots could be converted into open space or additional units depending on the future interest and pressures.

A second IRPTN station in support of this precinct is located along the rail line approximately 200 meter north east of the site at Montclair Station. The second station provides residents of the precinct with additional choice and accessibility to the greater eThekwini region.
4.4. **ARTIST IMPRESSIONS OF THE PRECINCT**

**Diagram 4.3: Artist Impression 1**
DIAGRAM 4.5: ARTIST IMPRESSION 3
DIAGRAM 4.6: ARTIST IMPRESSION 4
DIAGRAM 4.7: ARTIST IMPRESSION 5
4.5. **SCHEDULE OF BUILDING GLA**

The following tables provide the total number of units, bulks and F.A.R’s per block (1 – 4), as identified on the above site development plan.

The precinct summary table identifies that the node contains a total of 329 units. The overall density for sites two, three and four is 127 du/ha, 40 du/ha and 90 du/ha respectfully, with a consolidated overall density for the site at 82 du/ha.

**TABLE 4.1: CLAIRWOOD TOD**

<table>
<thead>
<tr>
<th>SITE</th>
<th>AREA</th>
<th>UNITS</th>
<th>RETAIL SPACE</th>
<th>BULK</th>
<th>FAR</th>
<th>DENSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3036</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>17123</td>
<td>291</td>
<td>639</td>
<td>13158</td>
<td>0.7</td>
<td>127 Du/ha</td>
</tr>
<tr>
<td>3</td>
<td>14042</td>
<td>57</td>
<td></td>
<td>3448</td>
<td>0.2</td>
<td>40 Du/ha</td>
</tr>
<tr>
<td>4</td>
<td>5887</td>
<td>53</td>
<td></td>
<td>3192</td>
<td>0.5</td>
<td>90 Du/ha</td>
</tr>
<tr>
<td>Total</td>
<td>40088</td>
<td>329</td>
<td>639</td>
<td>19798</td>
<td></td>
<td>82 Du/ha</td>
</tr>
</tbody>
</table>
5. PLANNING MOTIVATION

5.1. INTRODUCTION

The Planning Motivation provided in this section will not only motivate for the establishment of the proposed development, but will also serve as the basis for a Development Application in terms of the KZN Planning and Development Act.

The proposed introduction of higher density residential development in the Clairwood TOD can be motivated from a number of perspectives. Four specific perspectives are reflected on in this section, viz.

- Alignment with planning policies and strategies;
- Alignment with the proposed scheme (densification framework);
- Desirability of the development; and
- Need for the development.

5.2. ALIGNMENT WITH PLANNING STRATEGIES AND FRAMEWORKS

5.2.1. THE NATIONAL DEVELOPMENT PLAN

The 2012 National Development Plan (NPC 2012) has a full chapter, Chapter 8, reflecting on the transformation of human settlements required. A key action then emanating from Chapter 8, following an analysis of the challenges faced with regard to human settlements in South Africa, is the need for a strategy to be developed for the “… densification of cities and resource allocation to promote better located housing and settlements.”

This action is supported with the following statements:

“When guided by effective planning, urban densification provides an opportunity to reduce the environmental footprint associated with delivering utility services such as waste management, electricity, water and sanitation, and public transport. It also improves access to social services such as health and education.”

“Municipalities should establish a few transformation zones to act as catalysts and demonstration projects for urban integration and densification.”

The National Development Plan goes further calling for an urgent review of the existing grant and subsidy regime for housing with a view to “prioritising development in inner cities and in other areas of economic opportunity such as around transport hubs and corridors”. It is suggested that a densification or restructuring subsidy or allowance could be considered.
The above all suggesting that the proposed development is fully supported by national guidelines.

5.2.2. THE PROVINCIAL GROWTH AND DEVELOPMENT STRATEGY

Following on from the National Development Plan (2012) the Provincial Growth and Development Strategy also establishes objectives supporting densification. Objective 12 focussing on the development of sustainable human settlements specifically supports:

- Densification of settlement patterns
- Development of a provincial strategy and plan to address the housing Gap Market

Further to this Objective 29 specifically calls for actively promoting spatial concentration and coordination of development activities with a focus on the spatial transformation of settlements.

The proposed development is viewed as an implementation activity aimed at achieving the Provincial objectives.

5.2.3. THE ETHEKWINI IDP AND SDF

The 2013/14 IDP Review of the eThekwini Municipality fully supports the principle of densification and as such has adopted the recommendations of the 2013/2014 Spatial Development Framework discussed in more detail in the section that follows.

To achieve the spatial desired outcomes of the 2013 / 2014 SDF a number of development strategies were formulated. The strategies are also guided by the SDF vision ‘to have by 2013 a socially equitable, environmentally sustainable and functionally efficient Municipality that bolsters its status as a gateway to Africa’ (2013: 160).

5.2.4. THE ETHEKWINI DENSIFICATION STRATEGY

In 2012, the eThekwini Municipality commissioned Royal HaskoningDHV to prepare the ‘City Densification Strategy’.

The purpose of the project was ‘to shift the growth trajectory of the city in a more efficient, equitable and/or sustainable direction... through the development of a specific strategy for the direction and management of one of the most important characteristics that influences the quality and performance of, and the efficiency and sustainability of human settlements i.e. urban and rural settlement density’ (City Densification Strategy, 2013).

The current project address specifically Strategies 1 and 2 in the SDF:

**Strategy 1** – Managing urban growth, construct and maintain viable built environment and sustain natural environments and resources.

The spatial focus of this strategy is protecting and enhancing rural, agricultural and urban built and natural environments, which aims at maximising opportunities for sustainable urban form and promoting sustainable use of resources and protection of the natural environment and agricultural resources.

The key elements of this strategy include environmental protection and enhancement, climate change, place-making, and optimal use of existing infrastructure. Good design, creativity and innovation are essential to improve the built environment and make better use of land to support sustainable patterns.

**Strategy 2** – Improve access and movement of people and goods between areas of need and areas of opportunity.

This strategy is informed by the principle of spatial concentration and promotes efficient movement of people and goods, urban infill and densification. The spatial focus of this strategy is to address challenges relating to spatial fragmentation and distorted settlement patterns.
The document identifies density as an important key in planning, architecture and urban design, which is used to describe, predict and control the use of land. It also is identified as a measure of thresholds and urban efficiencies.

The report puts forward the following strategy to encourage the delivery of higher density residential development in ‘appropriate areas’;

1. Direct settlement and density into rural and urban zones;
2. Direct density to appropriate nodes and densification zones;
3. Direct density into specific nodes or corridor;
4. Density at a site level needs to respond to the specific locational context of a site.

The City Densification Strategy forms the foundations on which the ‘Densification and Action Plan for the Southern Public Transport Corridor’ is to be prepared. The principles and density targets will guide the development of more definitive application within the Southern Corridor.

5.3. ALIGNMENT WITH THE DENSIFICATION FRAMEWORK

The Clairwood/ Merebank sub-corridor presents opportunities for urban renewal with a focus on establishing a high quality business and logistics hub. The Clairwood/ Merebank area is a strategic sub-corridor as it is the convergence for three IRPTN corridors – the C2, C4 and C5 corridors.

This sub-corridor also presents two unique opportunities to develop two full TOD type developments around the Clairwood and Montclair stations.

The central Clairwood/ Merebank area along the IRPTN route is currently subject to urban decay. Introducing a high quality business and logistics hub would require an urban renewal strategy. Reinforcing the urban renewal strategy, two TOD Development opportunities have been identified around the Clairwood and Clairwood South Station Precincts. The TOD nodes are also supported by a substantial social facilities node. To encourage upliftment and regeneration of the area the following landuse proposals have been suggested;

TRANSIT ORIENTED DEVELOPMENT

Transit Oriented Development (TOD) has been identified around the Clairwood and Clairwood South Stations within this sub-corridor. Development in these zones should contain a mix of commercial and residential uses. These zones are envisaged to consist of higher residential densities and intensity of commercial uses. The two TOD sites are linked via a high density residential cluster wedged between South Coast Road and Roland Chapman Drive.

HIGH DENSITY RESIDENTIAL

The high density residential zones currently consist of a large number of row houses and flats. It is proposed that these areas increase their densities in support of the adjacent TOD developments.
It is proposed that the zone between Kenyan Howden and Blamey Road becomes a high density residential and mixed use cluster in support of the light industry/logistics intensification within this sub-corridor boundary.

RESIDENTIAL

The existing residential development adjacent to the high density residential and the TOD sites should acquire addition rights. Second dwellings are encouraged for these properties to allow for greater support of the IRPTN.

COMMERCIAL

The commercial development located along South Coast Road supporting the Clairwood TOD node. The commercial uses envisaged for this area should be a mixed use retail and residential mix. The area should be characteristics of a Town Centre type function.

LIGHT INDUSTRY/LOGISTICS

The majority of the remaining sub-corridor consists of Light Industry/Logistics. It is proposed that the Clairwood/Merebank area is promoted for light industrial and logistics business parks in support of the dig-out port.
The following provides the proposed zoning tables for the land holdings surrounding the Clairwood South Node within the Clairwood/ Merebank sub-corridor. (The full tables for the corridor are within the annexures in the Land Use Framework Report prepare preceding this document.)

### TABLE 5.1: PROPOSED ZONING TABLES FOR LAND HOLDINGS

<table>
<thead>
<tr>
<th>ZONE</th>
<th>COMMENT</th>
<th>STATEMENT OF INTENT</th>
<th>FAR</th>
<th>COVERAGE</th>
<th>HEIGHT</th>
<th>SETBACKS</th>
<th>PERMITTED</th>
<th>CONSENT</th>
<th>PROHIBITED</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRPTN Mixed-Use Residential 2 (High Density Residential)</td>
<td>This is a new zone for inclusion within an amended Town Planning Scheme</td>
<td>To provide a zone for a mix of Residential, office and Ground floor shopping uses to service the needs of the residents.</td>
<td>TOTAL 1.5 Residential and office use component will be 1.00</td>
<td>80%</td>
<td>4 Storeys 6 Storeys for “Landmark” Buildings at strategic points</td>
<td>For buildings fronting IRPTN F: 0 Build to line S: 0 R: 5m For other sites F: 7.5 S: 3m &amp; 1.2m per floor R: 5m</td>
<td>Dwelling House, Domestic Staff Accommodation Residential Building, Institution, Shop Offices</td>
<td>Licensed Hotel, Parking Garage, Place of Instruction, Place of Worship, Social Hall, Cremère, Special Building or use, Bottle store Petrol Service Station Special Building or Use</td>
<td>Spray Painting and Panel Beating Light Industry Service industry Action Sports bar Adult Premises Escort agency Funeral parlour Night Club Shelter Tavern</td>
</tr>
<tr>
<td>TOD Small</td>
<td>The residential component is to be aligned to the street frontage</td>
<td>A zone that makes provision for the parking, drop off and collection of passengers by rail, public and private bus services and mini bus taxis; as well as associated commercial and residential uses.</td>
<td>0.8</td>
<td>50%</td>
<td>6</td>
<td>F: 0 Build to line S: 3m R: 5m</td>
<td>RESIDENTIAL Residential COMMERCIAL Automatic Teller Machine Taxi/ Bus Facilities; Office; Public Office Ablutions Shops Restaurants Parking Garage Car wash Informal Trade Area Special Use INSTITUTION Municipal Purposes</td>
<td>OFFICE Office Building</td>
<td></td>
</tr>
</tbody>
</table>
5.4. THE DESIRABILITY OF THE DEVELOPMENT

The motivation for the redevelopment of the site is based on both proving “need” and “desirability”. The “desirability” is a concept of motivation, and in turn serving as a basis for evaluation, are defined as follows (Kahn 2014):

Desirability dealing with the desirability of physical impacts of such amendments should extend beyond the site and specific requirements of the applicant. The concern here should be fundamentally around broader interest and enhancement of public good. In other words would the amendments contribute to an improved context beyond the requirements of the particular site and is it in the interest of the overall public good. Equally then, being obviously assessed in terms of the broadest interest rather than individual views. This implies therefore also a longer term undefined public interest that is vested with public authority.

The Clairwood Precinct presents an opportunity for a new catalyst project within the Clairwood, Jacobs and Mobeni region. The new development aligns with current policy initiatives both at a municipal and national level. It is proposed that the Clairwood precinct be development into a small TOD (Transit Oriented Development) facility to support the introduction of the IRPTN system as well as the eThekwini Densification Strategy. The site presents unique opportunities with the development of an IRPTN station at the Kenyon Howden and South Coast Road Intersection.

It has been proposed that the site on the corner of Kenyon Howden and South Coast Road currently zoned as Open Space, be rezoned as a small TOD. The zone would make ‘provision for the parking, drop off and collection of passengers by rail, public and private bus services and mini bus taxis; as well as associated commercial and residential uses’.

The proposed site is located adjacent to two IRPTN stations, one on the C5 road based route and one on the C2 rail route. The rezoning and development of this site is imminent with the new transport and planning initiatives being directed by the eThekwini Municipality.

The proposed new zoning of the site does not conflict with current land uses or zoning in the area, it will compliment and provide new impetus for the area. The current zoning allows for ‘Public Open Space’, however the sports precinct located between three busy roads adjacent to two IRPTN stations is no longer the appropriate land use for this site.
The redevelopment of the site into a small TOD;

- Promotes and fulfills the eThekwini Municipalities Densification Strategy (2013);
- Acknowledges the need for densification along the IRPTN corridors, of which Kenyon Howden, South Coast Road and the rail line form two of the main routes identified as the C5 and C2 Corridors;
- Achieves the objectives of this study which were to test if 80 du/ha prescribed in the eThekwini Densification strategy could be achieved and if so, how;
- Provides a unique catalyst development opportunity within the Clairwood area through the redevelopment of a key site at a strategic, well located intersection.

5.5. THE NEED FOR THE DEVELOPMENT

The motivation for the redevelopment of the site is based on both proving “need” and “desirability”. The “need” is a concept of motivation, and in turn serving as a basis for evaluation, are defined as follows (Kahn 2014):

Need is understood to be relating to overall established patterns of need and not solely subject to the individual need of a particular applicant. In other words, need must be assessed within the broader context, supported by trends evidenced within such a context.

5.5.1. A NATIONAL MARKET PERSPECTIVE

A general view is that the residential property sector “... remains under pressure from more stringent mortgage finance conditions, the tough economic conditions facing many households in South Africa and the low level of consumer confidence”. This statement is based on planning and completion figures from Statistics South Africa for 2012 and 2013. It is reflected that residential plans passed by major municipalities declined when compared with the same period in 2011. The number of completed residential projects grew marginally (AECOM 2013).

AECOM (2013) indicates that “... the strongest demand is experienced in the “smaller-sized houses” and “flats and townhouses” segments driven by urban densification process and efforts to draw more lower- to middle-income households into the housing market”. It is suggested that demand for houses larger than 80m² will remain subdued.

In 2013 a further decline in residential sector activity was expected. Noted, however, was the fact that this will not be the case in the affordable and small housing segments. Although it is suggested in the AECOM report that this will mostly be Gauteng and Western Cape regions it is anticipated that this will also be the case in eThekwini where increasing migration into urban areas are still experienced. The AECOM report specifically notes that there are “... likely to be
increasing opportunities to provide low-income housing closer to transport nodes and employment prospects”.

5.5.2. AN OCCUPIER PERSPECTIVE

Based on a series of interviews conducted with people making use of the transport system in the Corridor the following was established:

- People are not unfamiliar with the concept of higher density living;
- A good understanding exists of the implications (advantages and disadvantages) of higher density living and the trade-offs to be made if they want to live closer to transport networks;
- If provided with choices, and if the implications of those choices are understood, people will choose higher density living;
- Specifically the management of higher density accommodation was highlighted as an important success factor; and
- The need for buildings to be developed with the needs of occupants in mind is important – this relates specifically to the cultural preferences of occupants.

The basic conclusion drawn from the interviews were that higher density housing is in high demand, and that if provided with the opportunity, the majority of people will opt for well-located higher density housing located in the Southern Transport Corridor. The Clairwood TOD presents such an opportunity.

5.5.3. THE PROPERTY BROKER PERSPECTIVE

Property brokers in the various neighbourhoods forming part of the Southern Corridor were engaged with. Property brokers interviewed were mostly from established firms covering areas such as Durban Central, Bluff, Chatsworth, Montclair, Umlazi and Yellowwood Park amongst others.

The general views expressed by the brokers were that:

- there is a vibrant property market in the areas relating to the Corridor with a high demand for properties;
- established agencies are now expanding offices in previously disadvantaged areas due to the level of activity in the market;
- the factors that appeal to (potential) buyers in the Corridor include good access to retail centres, the accessibility of public transport routes and services, access to government services such as good schools, and then also easy access to the CBD;
- in certain areas such as the Bluff and Yellowwood Park safety and security were suggested as contributing to the general appeal for the area;
- the high level of interest in the established suburbs such as Montclair and Umbilo is from people currently residing in Lamontville, Umlazi and the rural areas of eThekwini;
- people buying and renting in Umlazi and Lamontville are generally those that have moved to the city from rural KwaZulu-Natal and secured permanent employment; and
- the demand for higher density housing is particularly high, but the supply in the Corridor is limited.

Property brokers interviewed could not identify any new higher density developments in the corridor. It was suggested that it will not be difficult to find buyers for any new units provided in the Corridor area.

The highest demand for properties are:

- In Umlazi, properties priced between R300k and R500k, generally 2 or 3 bedroom houses;
- In Montclair, properties priced between R400k and R500k, generally 2 or 3 bedroom flats or detached houses;
- In Durban CBD and immediate surrounds, properties priced between R300k and R400k (also as low as R250k), generally flats;
- In Bluff, three bedroom houses priced around R800k.
This demand relates to the lower-middle to middle income markets, i.e. those who are “bankable” and will qualify for bond finance. It is then also anticipated that this is where development in the King Edward Residential Precinct will be focussed and where the private sector developer will have an interest.

Over and above this the demand for low income subsidy housing, i.e. between R80k and R200k, is evident from the large number of informal settlements and informal backyard dwellings in specifically the Umlazi section of the Corridor.

5.5.4. THE PROPERTY MARKET PERSPECTIVE

Based on current information and databases developed the following basic observations regarding the property market can be made:

- Property market is vibrant with large number of properties in proximity to the corridor being traded. However, the current database reflects 39ha of land traded in proximity to the corridor 2010 to 2013.
- Currently properties with a total area of just more than 12ha are on the market (as reflected on the Windeed database) within proximity to the corridor.
- Property prices vary substantially between the various components of the corridor as do the use / zoning of properties.

The above suggests that property market forces alone will not facilitate adequate densification.

A property transaction database reflecting on 247 transactions between 2010 and 2013 in proximity to the corridor has been developed. More than 56 properties in close proximity or in the Clairwood – Merebank component of the corridor were traded. The property transaction database confirms a vibrant property market in all components of the corridor.

### TABLE 5.2: THE PROPERTY TRANSACTION DATABASE – NO OF RECORDS

<table>
<thead>
<tr>
<th>CORRIDOR SEGMENT</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clairwood – Merebank</td>
<td>8</td>
<td>8</td>
<td>14</td>
<td>56</td>
<td>86</td>
</tr>
<tr>
<td>Congella – Umbilo</td>
<td>6</td>
<td>16</td>
<td>21</td>
<td>46</td>
<td>89</td>
</tr>
<tr>
<td>Isipingo</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Umlazi</td>
<td>7</td>
<td>12</td>
<td>13</td>
<td>27</td>
<td>59</td>
</tr>
<tr>
<td>CORRIDOR AS A WHOLE</td>
<td>24</td>
<td>39</td>
<td>49</td>
<td>135</td>
<td>247</td>
</tr>
</tbody>
</table>

### TABLE 5.3: THE PROPERTY TRANSACTION DATABASE – MAX, MIN AND AVE PRICE

<table>
<thead>
<tr>
<th>CORRIDOR SEGMENT</th>
<th>MAX OF PRICE PER SQ M</th>
<th>AVG OF PRICE PER SQ M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clairwood – Merebank</td>
<td>R 5,427</td>
<td>R 1,306</td>
</tr>
<tr>
<td>Congella – Umbilo</td>
<td>R 10,517</td>
<td>R 2,308</td>
</tr>
<tr>
<td>Isipingo</td>
<td>R 1,056</td>
<td>R 328</td>
</tr>
<tr>
<td>Umlazi</td>
<td>R 2,889</td>
<td>R 664</td>
</tr>
<tr>
<td>CORRIDOR AS A WHOLE</td>
<td>R 10,514</td>
<td>R 1,462</td>
</tr>
</tbody>
</table>

The implications of the current property market in the corridor for densification is that accessing land for development at reasonable prices will be a challenge. Therefore, by making municipal land available for higher density developments, will facilitate the interest of developers in providing housing opportunities in this market. The impact of high land prices will also be overcome by developing at greater densities.
6. THE ENVIRONMENT

6.1. INTRODUCTION

The Southern Public Transport Corridor (SPTC) provides the framework for the restructuring of the Southern region of the eThekwini Municipality. Multiple residential linkages, previously unconnected to the Central Business District, will form part of the basic structure of the Southern Region. The environment assessment has been prepared in order to present the preliminary input from an environmental perspective for the proposed Clairwood TOD.

Previous assessments identified the need for Basic Assessment procedures to be carried out for the King Edward Residential Precinct. This was due to the developments triggering GNR 544 and GNR 546 of the National Environmental Management Act (107 of 1998) (NEMA) 2010 Environmental Impact Assessment (EIA) Regulations.

This section serves as preliminary impact assessment to identify key environmental issues and regulatory requirements associated with the development of the Precinct. The purpose for this is two-fold: to provide initial input into the required environmental permitting requirements; and outline requirements for the implementation plan.

6.2. PROJECT DESCRIPTION

eThekwini Municipality proposes to develop a mixed use residential and commercial zone in Clairwood on Erf: 1068, located along Kenyon Howden Road and South Coast Road. The proposed development will cover 16 350 m² of the total site area of 40 088 m². The site is currently zoned as Open Public Space and is used informally as a sports ground. The proposed development will consist of a sports field, high density residential facilities and retail facilities. The residential density will be approximately 150 dwellings/ha.

Land surrounding the site is currently used for residential, transport and industrial purposes. Water, sewerage, sanitation and road services are therefore well developed in the area. Transnet railway lines are also situated along the eastern corner of the site boundary (MAP 6.1).
MAP 6.1: ENVIRONMENTAL SITE LOCALITY (WSP GIS, 2014)
6.3. ALTERNATIVES

No alternative sites have been identified for the proposed development. The position of the Clairwood site makes it a practical option as it is highly accessible via road and rail infrastructure hence presenting unlimited opportunities for a commercial and housing development. The site is located at the edge of a medium density residential area. This means the development will assimilate with an already existing residential zone. The Clairwood sub-corridor also presents the opportunity to develop two full transient orientated development (TOD) nodes around the Clairwood and Montclair Stations.

6.4. ACTIVITY DESCRIPTION / LEGAL FRAMEWORK

<table>
<thead>
<tr>
<th>ACTIVITY NUMBER</th>
<th>DESCRIPTION</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listing Notice 1 (GN: R544) requiring Basic Assessment</td>
<td>The transformation of land bigger than 1000 square metres in size, to residential, retail, commercial, industrial or institutional use, where, at the time of the coming into effect of this Schedule such land was zoned open space, conservation or had an equivalent zoning.</td>
<td>Applicable The Clairwood South Node exceeds the 1ha threshold and is zoned public open space.</td>
</tr>
<tr>
<td>(24)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Listing Notice 3 (GN: R546) requiring Basic Assessment</td>
<td>The construction of a road wider than 4 metres with a reserve less than 13.5 metres iii) Inside urban areas; in: aa) Areas zoned for use as public open space.</td>
<td>Applicable - GOBA has indicated that roads to access the sites/s and for internal connection will likely be 6m or more in width (i.e. at least 3m in each direction). - Although the Clairwood South Proposed Nodal Development is currently zoned POS, it is assumed the proposed developments will require rezoning. - However, should the EIA application be submitted prior to rezoning process (i.e. mixed use), this activity will be included as a trigger for the Clairwood Node.</td>
</tr>
<tr>
<td>(4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(38)</td>
<td>The expansion of facilities for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.</td>
<td>Applicable The estimated electricity demand figure for the proposed Clairwood South Node development is 1488 kilovolts</td>
</tr>
</tbody>
</table>

- GOBA has indicated that roads to access the sites/s and for internal connection will likely be 6m or more in width (i.e. at least 3m in each direction).
- Although the Clairwood South Proposed Nodal Development is currently zoned POS, it is assumed the proposed developments will require rezoning.
- However, should the EIA application be submitted prior to rezoning process (i.e. mixed use), this activity will be included as a trigger for the Clairwood Node.
TABLE 6.1: ACTIVITY POSITION

<table>
<thead>
<tr>
<th>Latitude (S)</th>
<th>Longitude (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>29° 55'</td>
<td>40.01°</td>
</tr>
<tr>
<td>30° 58'</td>
<td>10.1°</td>
</tr>
</tbody>
</table>

TABLE 6.2: SIZE OF THE ACTIVITY

40 088m²

Does ready access to the site exist?

YES     NO ✓

NEED AND DESIRABILITY OF THE ACTIVITY

The National Development Plan (2011) places strong emphasis upon job creation and poverty alleviation. This is also embraced by the KwaZulu-Natal Development Strategy which aims to harmonise environmental integrity and human and social development with economic development. Global production markets have been driven largely by the development of new production processes and sophisticated supply chains. South Africa, and specifically KwaZulu-Natal, has not kept pace with these global changes, which has led to a relative decline in productivity (KZN PGS, 2011). The Durban South region is the employment hub for both the eThekwini Municipality and KwaZulu-Natal province. Population growth is another driver for the proposed developments as the number of people moving into the region continues to increase. There is a demand for high density residential developments around places of employment which will accommodate the increasing numbers within the corridor. The Durban South region has been through a phase of decline with limited investments and limited job creation. Clairwood is characterised by decay of business and residential infrastructure. The vision of the Southern Public Transport Corridor is a sustainable urban environment supported by an efficient public transport system. The proposed developments present an opportunity for sustainable urbanism which embraces ecological, economic and social development. The Southern Public Transport Corridor will help facilitate major investment and job creation in the region. The development of new infrastructure will make the Clairwood more attractive for settlement, hence supporting employment and settlement in close proximity.

APPLICABLE LEGISLATION AND POLICIES

A review of South Africa legislation, policy, guiding frameworks, strategies and standards that have potential relevance to the proposed development was undertaken in the scoping assessment.

TABLE 6.3: APPLICABLE LEGISLATION AND POLICIES

<table>
<thead>
<tr>
<th>TITLE OF LEGISLATION, POLICY OR GUIDELINE:</th>
<th>ADMINISTERING AUTHORITY:</th>
<th>DATE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning and Development Act 6 of 2008</td>
<td>KwaZulu-Natal Planning and Development</td>
<td>2011</td>
</tr>
</tbody>
</table>
TABLE 6.4: SOLID WASTE MANAGEMENT

| Will the activity produce solid construction waste during the construction/initiation phase? | YES ✓ | NO |
| If yes, what estimated quantity will be produced per month? | Unknown |

TABLE 6.5: LIQUID EFFLUENT

| Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? | YES | NO ✓ |
| Will the activity produce any effluent that will be treated and/or disposed on site? | Yes | NO ✓ |
| If yes, contact the KZN Department of Agriculture & Environmental Affairs to obtain clarity regarding the process requirements for your application. |
| Will the activity produce effluent that will be treated and/or disposed of at another facility? | YES | NO ✓ |

TABLE 6.6: EMISSIONS INTO THE ATMOSPHERE

| Will the activity release emissions into the atmosphere? | YES ✓ | NO |
| If yes, is it controlled by any legislation of any sphere of government? | YES ✓ | NO |
| The NEM: AQA provides the legal framework for air quality management in South Africa and provides a system based on ambient air quality standards and corresponding emission limits (During the construction phase dust has the potential to be generated causing negative impacts on nearby receptors). |

TABLE 6.7: GENERATION OF NOISE

| Will the activity generate noise? | YES ✓ | NO |
| If yes, is it controlled by any legislation of any sphere of government? | YES ✓ | NO ✓ |
| The activity has the potential to produce noise during the construction process as a result of normal construction and excavation activities. Acceptable levels are prescribed by SANS 10103:2008 (The Measurement and Rating of Environmental Noise with Respect to Annoyance and to Speech Communication). It is the most relevant code of practice for environmental noise impact assessment in South Africa. The rating levels for urban districts are applicable to the proposed projects. |

TABLE 6.8: WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

- Municipal water board
- Groundwater
- River, stream, dam or lake
- Other
- The activity will not use water
6.5. SITE / AREA / PROPERTY DESCRIPTION

TABLE 6.9: GRADIENT OF THE SITE

|------|-------------|-------------|-------------|--------------|-------------|-----------------|

TABLE 6.10: LOCATION IN LANDSCAPE

<table>
<thead>
<tr>
<th>Ridgeline</th>
<th>Plateau</th>
<th>Side slope of hill/mountain</th>
<th>Closed valley</th>
<th>Open valley</th>
<th>Plain</th>
<th>Undulating plain/flow hills</th>
<th>Dune</th>
<th>Sea-front</th>
</tr>
</thead>
</table>

TABLE 6.11: GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

<table>
<thead>
<tr>
<th>Shallow water table (less than 1.5m deep)</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dolomite, sinkhole or doline areas</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Seasonally wet soils (often close to water bodies)</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Unstable rocky slopes or steep slopes with loose soil</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Dispersive soils (soils that dissolve in water)</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Soils with high clay content (clay fraction more than 40%)</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Any other unstable soil or geological feature</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>An area sensitive to erosion</td>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>

TABLE 6.12: GROUNDCOVER

<table>
<thead>
<tr>
<th>Natural veld - good conditionE</th>
<th>Natural veld with scattered aliensE</th>
<th>Natural veld with heavy alien infestationE</th>
<th>Veld dominated by alien speciesE</th>
<th>Gardens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sport field</td>
<td>Cultivated land</td>
<td>Paved surface</td>
<td>Building or other structure</td>
<td>Bare soil</td>
</tr>
</tbody>
</table>

Clairwood falls within the Northern Coastal Grasslands and a very small portion of Durban Metropole North Coast Grassland along the north west section. Large portions of the natural vegetation of this area have been significantly transformed through urbanisation and industrialization resulting in a proliferation of alien vegetation. The surface of the existing open space is dominated by grass and strips of woodlands on the edges of the site boundary with negligible or no indigenous vegetation.

Land use character of surrounding area

The table below lists the activities taking place within 500m from the site as required in DEDTEA’s Basic Assessment report template. The locations of the listed activities are shown in Map 6.2.

TABLE 6.13: LAND USE CHARACTER

<table>
<thead>
<tr>
<th>LAND USE CHARACTER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural area</td>
<td>YES&lt;sup&gt;☑&lt;/sup&gt; NO Wetland on the Clairwood racecourse (approximately 1km) South of South Coast Road</td>
</tr>
<tr>
<td>Low density residential</td>
<td>YES&lt;sup&gt;☑&lt;/sup&gt; NO</td>
</tr>
<tr>
<td>Medium density residential</td>
<td>YES&lt;sup&gt;☑&lt;/sup&gt; NO Medium density residential located across the northern boundary of the site (along Roland Chapman Drive).</td>
</tr>
<tr>
<td>High density residential</td>
<td>YES&lt;sup&gt;☑&lt;/sup&gt; NO</td>
</tr>
<tr>
<td>Informal residential</td>
<td>YES&lt;sup&gt;☑&lt;/sup&gt; NO</td>
</tr>
<tr>
<td>Retail commercial &amp; warehousing</td>
<td>YES&lt;sup&gt;☑&lt;/sup&gt; NO Retail and warehousing is situated along South Coast Road.</td>
</tr>
</tbody>
</table>
## Land Use Character Description

<table>
<thead>
<tr>
<th>Land Use Character</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light industrial</td>
<td>YES NO Located approximately 1.9km from the Kenyon Howden Road boundary is Mobeni Industrial area.</td>
</tr>
<tr>
<td>Medium industrial</td>
<td>YES NO Major Hazard Installations within the South Durban Basin (approx. 2.6km)</td>
</tr>
<tr>
<td>Heavy industrial</td>
<td>YES NO Sub Station approx. 140m from the western boundary of the proposed site.</td>
</tr>
<tr>
<td>Power station</td>
<td>YES NO Sub Station approx. 140m from the western boundary of the proposed site.</td>
</tr>
<tr>
<td>Office/consulting room</td>
<td>YES NO Clairwood Hospital</td>
</tr>
<tr>
<td>Military or police base/station/compound</td>
<td>YES NO Sacred Heart Catholic Church is approximately 430m from the north western boundary.</td>
</tr>
<tr>
<td>Spoil heap or slimes dam</td>
<td>YES NO The Clairwood Station is approximately 1.8km whilst Montclair Station is 450m from the proposed site.</td>
</tr>
<tr>
<td>Quarry, sand or borrow pit</td>
<td>YES NO Transnet railway lines</td>
</tr>
<tr>
<td>Dam or reservoir</td>
<td>YES NO The Clairwood Station is approximately 1.8km whilst Montclair Station is 450m from the proposed site.</td>
</tr>
<tr>
<td>Hospital/medical centre</td>
<td>YES NO Clairwood Hospital</td>
</tr>
<tr>
<td>School/creche</td>
<td>YES NO Ningizimu Special School is approximately 250m across the eastern boundary of site.</td>
</tr>
<tr>
<td>Tertiary education facility</td>
<td>YES NO Nature conservation area is approximately 430m from the north western boundary.</td>
</tr>
<tr>
<td>Church</td>
<td>YES NO The Clairwood Station is approximately 1.8km whilst Montclair Station is 450m from the proposed site.</td>
</tr>
<tr>
<td>Old age home</td>
<td>YES NO The Clairwood Station is approximately 1.8km whilst Montclair Station is 450m from the proposed site.</td>
</tr>
<tr>
<td>Sewage treatment plant</td>
<td>YES NO Transnet railway lines</td>
</tr>
<tr>
<td>Train station or shunting yard</td>
<td>YES NO South Coast Road</td>
</tr>
<tr>
<td>Railway line</td>
<td>YES NO Transnet railway lines</td>
</tr>
<tr>
<td>Major road (4, lanes or more)</td>
<td>YES NO South Coast Road</td>
</tr>
<tr>
<td>TABLE 6.14: CULTURAL/ HISTORICAL FEATURES</td>
<td></td>
</tr>
<tr>
<td>------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or within 20m of the site?</td>
<td>YES</td>
</tr>
<tr>
<td>Will any building or structure older than 60 years be affected in any way?</td>
<td>YES</td>
</tr>
</tbody>
</table>

The proposed development involves the rezoning and constructions of roads. A project profile must be uploaded on the South African Heritage Resources Information System (SAHRIS) for review and comment by the provincial heritage body, AMAFA.

### 6.6. PUBLIC PARTICIPATION GUIDELINE

Stakeholder Engagement undertaken during this preliminary assessment has included direct liaison with the eThekwini in order to ensure compliance with the applicable national legislation the stakeholder consultation process should be guided by Chapter 6 of the NEMA EIA Regulations Government Notice Regulation (GNR.) 543, with specific reference to Sections 54 - 57. The NEMA requires that an inclusive, transparent process of stakeholder engagement; sharing of information, receipt of comments, expression of issues and concerns, and response and feedback regarding issues and concerns, be undertaken that allows participation by any and all persons and entities who may be affected by and/or have an interest in the proposed developments.

### 6.7. PRELIMINARY ENVIRONMENTAL IMPACT ASSESSMENT

A preliminary identification of potential environmental impacts associated with the proposed projects is provided below. A full detailed assessment including the rating of impact significance rating and identification of mitigation measures will need to be undertaken during the regulatory EIA process.

#### 6.7.1. CONSTRUCTION IMPACTS ASSOCIATED WITH THE CLAIRWOOD NODE

**POTENTIAL NOISE IMPACTS**

Typical construction activities, including structural concrete works, construction vehicles and machinery and labourers on site, have the potential to result in noise impacts. Elevated noise levels have the potential to disrupt the nearest residential area situated along Roland Chapman Drive approximately 140m from the Clairwood site boundary and Ningizimu Special School which is approximately 300m west of the proposed site. Acceptable levels are prescribed by SANS 10103:2008 (The Measurement and Rating of Environmental Noise with Respect to Annoyance and to Speech Communication). The rating levels for urban districts are applicable to the project.

**POTENTIAL AIR QUALITY IMPACTS**

The movement of construction vehicles has the potential to generate dust and lead to localised deterioration of air quality. This could potentially result in a nuisance factor to receptors. The impact, however, is likely to be of low significance due to the transient nature of the construction period and the site specific construction footprint. Construction phase result in an increase in emissions. During the construction phase primary emission sources will include excavation and earth moving activities with particulate matter being the extensive pollutant. Furthermore vehicular emissions from construction vehicles and trucks transporting materials
and labour will have an impact on local air quality. These potential impacts will be a nuisance for residents located across Roland Chapman Drive and Roland Avenue.

**POTENTIAL SURFACE AND GROUNDWATER IMPACTS**

The construction phase of the projects will result in the generation of typical construction waste streams associated with construction activities. Accidental spillage of hazardous substances (oils, greases) and various construction materials (cement) has the potential to contaminate stormwater. This has the potential to contaminate both surface and groundwater. All waste solid, liquid or hazardous, will require that they be adequately handled and disposed of. Earth moving activities will increase the potential for localised soil erosion to occur. Potential impacts relate to dust generation and stormwater contamination. The removal of vegetation exposes soil to wind and stormwater runoff, which leads to potential erosion of the soils. There are several legislations formulated to regulate the management and disposal of waste. A Waste and Spillage Management Plan must be prepared for the handling of waste on site.

**POTENTIAL TRAFFIC IMPACTS**

Equipment and materials will be delivered to the sites via trucks. This has the potential to increase traffic and put pressure on the road networks in the immediate areas resulting in congestion. Potential receptors for the Clairwood site include residents of Roland Avenue. Potential road traffic nuisances are predicted to be of low significance and transient in nature and this will be limited to the construction period. No significant direct, indirect or cumulative impacts are anticipated.

**POTENTIAL VISUAL IMPACTS**

The proposed mixed use developments will change the aesthetics of the sites. Potential receptors to change include the local land-users, and those within the sites’ view-shed. The aesthetic impacts are predicted to be low as both sites have been neglected over the last few years. A positive aspect of the proposed developments is the incorporation of sustainable urbanism. Green structures are a key feature of sustainable corridors. Clairwood TOD designs have allowed for the some protection of natural systems. Green structures like sports field and green areas have been incorporated into the design layouts of the proposed developments.

6.7.2. **OPERATIONAL IMPACTS ASSOCIATED WITH THE UMBILO AND UMLAZI NODES**

**POTENTIAL NOISE IMPACTS**

Existing noise levels within the two nodes are those associated with land developments, the neighbouring roads (South Coast Rd), industrial and manufacturing facilities neighbouring the sites and train movements (Clairwood). The operational phase of the Clairwood Node may potentially increase the noise levels from the changes and increase in activities resulting in a nuisance factor to receptors. The nearest residential receptors for the Clairwood node are those along Roland Chapman Drive and the offices adjacent to the western part of the site boundary. With an increase in the number of people there will be an increase in vehicle movement in the area as a result of commercial facilities and day to day logistics. However these levels will be insignificantly low as the development is for residential purposes.

**POTENTIAL AIR QUALITY IMPACTS**

The Clairwood precinct is situated along a main road and associated with neighbouring industrial activities. The two main sources of air pollution in the corridors are from industrial processes (Mobeni) and motor vehicles along main transport routes (South Coast). The air quality is further compounded by other mobile sources such as emissions from trains.
Positive impacts in terms of ambient air quality are anticipated with this project as the proposed developments aim to bring communities closer to public transportation. By minimising the use of private transport there will be a decrease of vehicular emissions. This will have significant positive impacts by decreasing CO2 levels and curbing the challenge of climate change in the long term.

POTENTIAL SURFACE AND GROUNDWATER IMPACTS

The operation phase of the projects will result in the generation of general waste (paper and plastics) and domestic effluent (sewage). There is the potential of surface contamination from litter pollution of general waste if not disposed and managed properly. Significant impacts associated with the generation of waste and domestic effluent are not anticipated as the development will be connected to the municipal sewerage system and services by Durban Solid Waste (DSW).

POTENTIAL TRAFFIC IMPACTS

An increase in the number of motor vehicles in and around the two nodes as a result of the influx residents and employees has the potential to increase traffic and lead to congestion. Impacts, however, are anticipated to be low due to it the location of these nodes next to Integrated Rail Public Transport Network (IRPTN) nodes / stations. The aim of these proposed projects is to reduce per capita motor vehicle travel which will reduce the overall road congestion levels and travel times. By improving public transportation people will shift from the use of private vehicles to public facilities.

6.8. IMPLEMENTATION PLAN INPUTS

The following specialist studies have been identified as being necessary to provide the required detail to facilitate the various environmental permitting requirements. It is recommended that where feasible, these studies commence prior to the initiation of the environmental authorisation process so as to inform the required approach:

<table>
<thead>
<tr>
<th>Study</th>
<th>Scope</th>
<th>Timeframe</th>
<th>Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Assessment</td>
<td>Environmental Authorisation for the priority node is required before construction can commence. The proposed activities trigger GNR 544 and GNR 546 – hence Basic Assessment (including mandatory stakeholder engagement is required).</td>
<td>5-6 months</td>
<td>R 113,000</td>
</tr>
<tr>
<td>Geotechnical Assessment</td>
<td>The geotechnical assessment will provide accurate information about the substrata profile and relevant soil and rock parameters at these sites to inform the design and construction phase. This is typically done as part of the Engineering Scope of Works. This should be carried out before the EA commences so that it feeds into the final designs/layouts.</td>
<td>1 month</td>
<td>R 19,000 (Desktop)</td>
</tr>
<tr>
<td>Stormwater Management Plan (SWMP)</td>
<td>Potential exists for increased stormwater runoff particularly during high rainfall events. A SWMP is required to address stormwater issues generated by the proposed developments. This could form a component of the Environmental Management Programme (EMP) that is required to be included in the Basic Assessment Report, or as a condition of the Environmental Authorisation for the proposed project should approval be granted.</td>
<td>See Engineering Services Report</td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Scope</td>
<td>Timeframe</td>
<td>Estimated</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>Traffic Impact Assessment (TIA)</td>
<td>A TIA is required to demonstrate the impact of the proposed project changes on the existing and proposed future road network. The potential change in transport related processes will need to be quantified for the proposed developments to assess the social and environmental impact of vehicular operations during the construction phase. The assessment is also required to predict current transport operations on existing and future transport infrastructures associated with the developments.</td>
<td>1 month</td>
<td>R 26,900</td>
</tr>
<tr>
<td>Heritage Impact Assessment (HIA)</td>
<td>It is recommended that desktop HIAs be carried out for all nodes to meet requirements of both the national and provincial heritage legislation.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6.9. CONCLUSION

The aim of the assessment was to contribute to the development of an Implementation Framework and an Area Specific Plan for the Clairwood TOD. Findings have been developed to assist in the commissioning of relevant specialist studies and provide the preliminary information for inclusion in the required environmental permitting processes.
7. **THE TRANSPORT ARRANGEMENTS AND IMPACT**

7.1. **INTRODUCTION**

The Traffic Impact Assessments (TIA) conducted for this development had a specific focus on:

- Impact on surrounding road network
- Impact on public transport network (capacity)
- Parking requirements

The detailed TIA is attached as Annexure B to this report.

A holistic approach was followed in the traffic and transportation analysis in that all modes of travel was assessed while meeting the requirements of a TIA. The expected trip generation was based on available data. All road links and critical intersections within close proximity to the selected development sites was analysed. Critical intersections was analysed using SIDRA software to estimate the post-development Level of Service (LOS) for the sites and assist in the intersection upgrade designs.

Focus was placed on public transport and non-motorised transport due to the already congested road network system within the selected areas as per the Framework Report. The future traffic scenarios that were modelled showed high volumes of traffic on all major arterials along the southern corridor, this shows that the road network will not be able to accommodate an increase in vehicular traffic in the future and therefore new developments should aim to promote the use of other modes of travel apart from private vehicles.

7.2. **LOCAL ROAD NETWORK AND SITE ACCESS**

Three major routes facilitate traffic movement within the local road network. South Coast Road is an important high volume mobility route serving the municipality to the south of the CBD. Kenyon Howden is an east-west mobility route and Roland Chapman Drive/ Halifax Road a north-south route providing mobility locally.

The Clairwood Precinct site is bounded by Roland Chapman Drive to the north-west and classified as a District Distributor road. It is a two lane bi-directional route with road widening at intersections to accommodate turning movements. The route has low existing traffic volumes of approximately 110 PCUs/ hr in the AM and PM peak direction.

Three of the four site accesses to the precinct are situated along Roland Chapman Drive. Due to the low vehicle trip generation (73 PCU) by the development in the AM and PM peak hours, together with the existing low traffic volumes along Roland Chapman Drive, the proposed accesses are expected to have a low impact on existing traffic operations.

Halifax Road, the extension of Roland Road further south, has significantly higher approach and departure volumes of 390 and 590 PCUs. This is due to the large turning movements to/from Kenyon Howden Road.

Kenyon Howden Road borders the south-western perimeter of the site, also classified as a District Distributor road. It consists of a dual carriageway, with two lanes in each direction. Traffic volumes are approximately 1,500 PCUs/hr and 900
PCUs/hr in the AM and PM peak directions respectively. One access to the precinct is proposed along this route. Due to the high traffic volumes along the route, and the presence of only a very narrow median, we recommend that access be limited to left in and left out movements at this access point.

South Coast Road borders the site to the south-east, also classified as a District Distributor road. The road is a dual carriageway with three lanes in each direction. Traffic volumes along the route is estimated at 3,300 PCU/hr and 2,300 PCU/hr in the AM and PM peak directions respectively. No direct access to the site can be gained from South Coast Road. The planned IRPTN system proposes a BRT route along South Coast Road with a BRT station in close proximity to the precinct. Safe access for pedestrians should be considered in the preliminary design of the BRT facilities. Due to the high traffic volumes along the road, a grade separated access option is deemed appropriate but must be confirmed in the detailed design of the C5 BRT Corridor.

7.3. THE TRANSPORT IMPACT ASSESSMENT

Based on the available planning/ analysis tools and limited available current information, a strategic planning process was adopted to estimate travel demand patterns and identify the impacts of the proposed development on road infrastructure. Sketch Planning was thus adopted to complete a four step modelling procedure. The results is detailed in the following sections with the process discussed in more detail in Annexure B.

7.3.1. DEVELOPMENT TRIP GENERATION

The tables below tabulate the trips generated by the proposed development in Clairwood, using TMH 17 and SATGR respectively.

<table>
<thead>
<tr>
<th>TABLE 7.1: TRIP GENERATION BY SITE – TMH(^17) TRIP GENERATION RATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TABLE 7.2: TRIP GENERATION BY SITE – SATGR TRIP GENERATION RATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
7.3.2. DEVELOPMENT TRAFFIC DISTRIBUTION AND ASSIGNMENT

Existing and future traffic conditions were assessed on the local road network in the immediate vicinity of the precinct.

In order to determine the distribution of trips and its assignment onto the local road network, the eThekwini Transport Authority’s 2015 AM Peak Period Car demand matrix was used. By strategically pairing the traffic zone of the precinct with groups of traffic zones throughout the municipality, origin-destination pairs were generated and the most likely traffic assignment through the local road network was estimated. Using the ratios of these demand matrix O-D pairs, the trips generated by the precincts were then assigned to the network. The Diagram below illustrates this process. Vehicle turning movements of development generated trips were estimated and superimposed onto existing traffic turning movement volumes. Turning movements for all scenarios considered are tabulated in Appendix A attached to the TIA.

DIAGRAM 7.1: TRIP DISTRIBUTION: CLAIRWOOD TOD

7.3.3. LOCAL TRAFFIC INTERSECTIONS

Assessment of the traffic operation without the proposed development allows the development of a baseline against which to test the real additional impacts of the development. Table 7.3 lists the overall intersection operating Level of Service (LOS) for the scenarios indicated above. Detailed output from the analysis, including intersection layouts, are located in Appendix B of the TIA.

Scenarios of Kenyon Howden and Roland Chapman Road Intersection for 2014, with and without development, have acceptable traffic operating LOS C and better. Scenarios for 2030 have operating LOS of E and F overall which are not acceptable to users.

Scenarios of Kenyon Howden South Coast Road Intersection for 2014, with and without development, have unacceptable traffic operating LOS F. Scenarios for 2030 have operating LOS F overall which are not acceptable to users.

The total volume of vehicle trips (presented in PCUs) generated by the precinct are small in comparison to both the existing traffic volumes as well as compared to the proposed 2% background traffic growth estimated for 2030 (37% traffic volume growth from 2014 to 2030). This is also confirmed by the overall similarity of results for scenarios with and without the precinct development. The essential conclusion from the results are that road infrastructure capacity in the future will be consumed by existing demand and growth thereof. The proposed precinct developments have a relatively minor role to play in the increased congestion that is expected in the future and the responsibility should therefore not rest with the developer to mitigate the poor LOS.

The operation of traffic intersections in the vicinity of the precinct was assessed using Sidra Intersection Assessment Software. The following scenarios were considered;
2014 AM & PM – No precinct development
2030 AM & PM – No precinct development
2014 AM & PM – Precinct development
2030 AM & PM – Precinct development

7.4. PUBLIC TRANSPORT

Public transport is an essential component to the successful densification of eThekwini’s Southern Corridor. The Clairwood precinct has been chosen due to its proximity to public transport services and more especially its proximity to proposed IRPTN stations.

7.4.1. PUBLIC TRANSPORT SERVICE CAPACITY

In Phase 2 of the SPTC Densification Framework project, the impacts of the corridor land use densification on the public transport demand was assessed using the eThekwini Transport Authority’s EMME model. It must be noted that the cumulative effects of the corridor densification were modelled, not only that of the precincts under consideration. Appendix C to the TIA contains series of EMME trip assignments which illustrate the estimated demand for two scenarios for the 2030 forecast year:

- High growth scenario;
- Southern Public Transport Corridor Densification scenario.

The proposed Integrated Rapid Public Transport Network, both rail and road, was used in the assignment process. A marginal increase in demand is displayed in the SPTC scenario on rail and road based public transport services, when compared to the High growth scenario. The demand levels on rail reach a maximum of 65,400 which is still within the long term planned rail corridor capacity of 80,000 passengers/hour. Road based BRT trunk routes reach a maximum demand of 8,800 passengers/hour which is also within the capacity of BRT services.

With this in mind, it is assumed that the line and station capacity necessary to meet demand will be addressed in the IRPTN planning activities.

<table>
<thead>
<tr>
<th>INTERSECTION NAME</th>
<th>PEAK HR</th>
<th>2014</th>
<th>2030</th>
<th>2014+DEV</th>
<th>2030+DEV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenyon Howden Road and Roland Chapman Road</td>
<td>AM</td>
<td>C</td>
<td>F(F)</td>
<td>C</td>
<td>F(F)</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td>B(E)</td>
<td>E(F)</td>
<td>B(E)</td>
<td>E(F)</td>
</tr>
<tr>
<td>Kenyon Howden Road and South Coast Road</td>
<td>AM</td>
<td>F(F)</td>
<td>F(F)</td>
<td>F(F)</td>
<td>F(F)</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td>F(F)</td>
<td>F(F)</td>
<td>F(F)</td>
<td>F(F)</td>
</tr>
</tbody>
</table>

F(F) – Overall Intersection LOS (Worst turning movement)
7.4.2. PUBLIC TRANSPORT DEMAND

As stated in the previous section, the EMME model scenarios developed in Phase 2 of the project determined the cumulative effect of all densification along the Southern Corridor. The precinct development under consideration in this TIA is only part of this densification initiative. Further, the precinct forms only a small part of a traffic zone within the EMME model. To this end, the public transport trip generation of each precinct cannot be determined directly using the available EMME model output.

In order to estimate the overall public transport demand for each precinct, the TMH 17 and SATGR have been used in conjunction with each other. The table below tabulates the estimated public transport vehicle trip demand for the precinct. A vehicle occupancy of 1.5 was then be applied to estimate the person trip generation of 197 trips produced and 66 trips attracted to the precinct.

<table>
<thead>
<tr>
<th>Site</th>
<th>Residential Units</th>
<th>Retail Bulk</th>
<th>Vehilce Trip Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Units</td>
<td>Area (m²)</td>
<td>Trip Production</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>219</td>
<td>639</td>
<td>106</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>53</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>272</td>
<td>639</td>
<td>131</td>
</tr>
</tbody>
</table>

7.4.3. PRECINCT NON-MOTORISED TRANSPORT FACILITIES

Most public transport journeys begin as an Non-Motorised Transport (NMT) trip. Therefore the critical consideration from a precinct transport infrastructure perspective is the provision of NMT facilities ensuring the safety and convenience of pedestrians. These will include pedestrian sidewalks, pedestrian crossings, public transport stops (lay-by and shelter) and traffic calming and control measures on pedestrian routes with high vehicle conflict. The level of service and safety at intersections is to be prioritised in the following order:

- Pedestrians/Cyclists;
- BRT/Public Transport;
- Non-BRT Vehicles.

The critical issue to consider in the Clairwood Precinct Development is the need for a grade separated crossing (to be confirmed during preliminary design of BRT infrastructure) of South Coast Road to access the proposed BRT station. In addition it is recommended that the BRT station be moved to the northern approach of South Coast Road. This is illustrated overleaf.
7.5. PARKING PROVISION

The proposed development must provide parking for its various users. The eThekwini Municipality has set out minimum parking guidelines for new developments based on the size and type of land use. The guidelines suggest a maximum relaxation of 10% may be considered at the discretion of The Head: Development Planning and Management and The Head: eThekwini Transport Authority.

Table 7.4 below indicates the estimated parking requirements for the precinct. These parking requirements are onerous and do not adequately take into consideration the beneficial effects of Transit Oriented Development (TOD) on parking demand.

<table>
<thead>
<tr>
<th>Development Details</th>
<th>Parking Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site</td>
<td>Dwellings Units</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>219</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>53</td>
</tr>
<tr>
<td>Total</td>
<td>272</td>
</tr>
</tbody>
</table>

In addition, such high parking demands will make these developments less appealing to property developers who must now factor in the cost of parking into the development costs. The average area required for a parking bay, including access roads, can be conservatively estimated at 25m². If one considers an average medium income apartment of 50m², this equates to an additional 50% area required for parking. When one considers the parking requirement of 7 bays per 100m² of retail area, this equates to an additional 175m² (175%) required for parking.

In line with the philosophy of TOD, the aims of reduced private vehicle trip generation and increased public transport use can be strengthened through a reduction of parking provision. This does not omit the possibility that a public transport user does not own a car. Therefore some level of parking provision is required, especially considering that the bulk of the development proposal is for residential land use.

An integrated precinct parking strategy is recommended for the precinct. Various measures may be explored between both prospective developers as well as the eThekwini Municipality. It must be acknowledged that the success of Transit Oriented Developments is dependent on both supportive policies by authorities which create opportunity and private sector involvement able to benefit from these opportunities.

A full assessment of parking policies, strategies, pricing and funding are outside the scope of this Traffic Impact Assessment, however the opportunities to create a less parking dependant precinct can be identified and explored further with prospective developers. A set of options for consideration is reflected in the TIA contained in Annexure B.
7.6. RECOMMENDATIONS

As noted, the high traffic demand which results in poor intersection operating levels are due to existing demand and estimated growth thereof. The precinct development play a minor role in the high demand volumes.

In order to address these issues the municipality must address the existing high private vehicle utilisation and increased car utilisation trends. The planned IRPTN will go a long way to addressing these issues, but must be supported by Travel Demand Management measures which can result in an increased public transport modal split and more efficient travel patterns within the municipality. These actions are beyond the scope of a TIA and must be addressed through more strategic municipal planning interventions.

Parking relaxations are recommended and must be implemented with an overall TOD strategy that supports public transport utilisation. It is recommended that strategies be implemented to unbundle parking costs from developments. The cost of parking can then be allocated directly to users who require parking, through commercial parking provision and pricing strategies which deter such practices.

Pedestrian infrastructure facilities which provide a safe environment for users of public transport is a critical component of a successful TOD design. Diagram 7.2 illustrates key considerations, but are by no means prescriptive or exhaustive.
8. INFRASTRUCTURE

8.1. INTRODUCTION

The following infrastructure components / civil services were considered in the business planning process:

- Water Supply
- Stormwater
- Sanitation / Sewer
- Potable Water
- Electricity

The civil services demand estimated for the proposed developments used Municipal Guidelines and the manual for Guidelines for Human Settlement Planning and Design, 2000 (Red Book).

Respective municipal departments were consulted to acquire the latest asbuilt drawings or services alignment for the civil services reticulation around the selected areas and also determine the amount of capacity available to accommodate the required demand.

The information provides an indication of the extent of civil infrastructure that will be required to accommodate the new development demands for each location. The findings, recommendations and costs are presented in this section.

See also Annexure C for related attachments and drawing.

8.2. WATER SUPPLY

8.2.1. EXISTING BULK RETICULATION

The existing bulk water reticulation around the site areas fall under the jurisdiction of eThekwini Municipality and is indicated on Drg. No. 344346/00/02G in Annexure C (Appendix A). Potable water for the areas around the Clairwood South site are supplied by Woodlands Reservoir 3/4 and Mobeni Reservoir.

8.2.2. PROPOSED RETICULATION

eThekwini Water has indicated that the new proposed developments can be supplied by the same reservoirs that are currently supplying the surrounding sites, subject to certain conditions. See attached pre-approval letters from eThekwini Water Department in Annexure C (Appendix B).

A full pressurized water reticulation system within a pressure zone at road level of between 250 to 800 kpa is to be supplied by eThekwini Water. In terms of the city bylaws the municipality however does not guarantee water pressures. According to eThekwini Water, the onus lies with the individual Developers to determine the municipal water pressure existing at road level and design their own on-line booster pumps etc. to meet the necessary water pressure demands for their relevant usage. EThekwini Municipality indicated that there have not been any water pressure problems within the areas where the new development is situated and therefore it is anticipated that there will be no on-line booster pumps required. This will need to be verified at detailed design stage.
The Guidelines for Human Settlement Planning and Design Manual was used to calculate the total water demand for the proposed development. Table 8.1 below outlines the expected average water consumption for the additional new development (once fully developed). The following design criteria were used:

- Residential Demand = 750 litres per day per household
- Commercial Demand = 400 litres per day per 100 m²
- Peak Factor = 4
- System Losses = 20%

<table>
<thead>
<tr>
<th>Development</th>
<th>Estimated Daily Flows (l/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clairwood South Precinct</td>
<td>11.5</td>
</tr>
</tbody>
</table>

The proposed internal layout for the water reticulation, for the site, along with the proposed connection point is shown on Drg. Nos. 344346/00/02W in Annexure C (Appendix C). A 110mm diameter class 12 mPVC pipe is proposed for the internal reticulation for the site.

The proposed connection for the Clairwood South precinct is off the 150mm diameter watermain along Roland Chapman Road.

It should be noted that a hydraulic study of the above mentioned existing watermain, that the development will be connecting to, will be conducted during the detailed design stage in order to determine available capacity and obtain final approval from council.

In order to conserve potable water, eThekwini's water wise policy should be promoted at these developments which includes the planting of indigenous vegetation in road reserves and open spaces.

In accordance with the 'Red Book', the proposed development is classified as high fire-risk category and will require a fire flow of 1500 l/min per hydrant (25 l/sec) and a minimum residual head of 15m. Fire hydrants will be installed for a hose reach of 60 m (maximum spacing of 120 m apart).

### 8.3. WASTEWATER DISPOSAL

Bulk wastewater infrastructure is in place within the immediate area of the proposed development as reflected in Drg. No. 344346/00/02G in Annexure C (Annexure B). The Clairwood South Precinct area drains to a 450mm diameter trunk sewer line along South Coast Road. This 450mm diameter trunk sewer ultimately discharges at the Central Treatment Works situated in the Bluff.

The proposed new densification yields for the site were used to estimate the amount of additional sewer generation that can be expected from the proposed development precinct. The Guidelines for Human Settlement Planning and Design Manual along with the EThekwini Sewer Design Manual was used to calculate the total sewer to be generated.

The following design criteria were used:

- Residential Demand = 750 litres per day per household
- Commercial Demand = 75 litres per person per day & 1 person per 15 m²
- Peak Factor = 2.5
- Stormwater Infiltration = 15%

Table 8.2 below outlines the expected sewer demand for the additional new development (once fully developed):
The proposed internal sewer reticulation for the site and the proposed connection point is shown on Drg. No. 344346/00/02S in Annexure C (Appendix D). A 160mm diameter uPVC pipe is proposed for the internal reticulation within the site. The proposed connection for the Clairwood South precinct will be at the 150mm diameter sewer line along Roland Chapman Road.

eThekwini Water and Sanitation Department confirmed that there is sufficient capacity along the trunk sewer mains that will be servicing the site and at the respective Treatment Works to accommodate the additional demand from the development. For local connection into the existing nearby reticulation, the department has to conduct a study along the existing sewer pipe, where connection is proposed, from the respective site to the trunk sewer main to determine if the pipes can be able to accommodate the additional demand.

Although the capacity of the existing bulk sewerage infrastructure, trunk mains and treatment works, for the site appears to be adequate to accommodate the new development; once the site layouts are finalized during detailed design stage, a meeting will be arranged with the municipality to inform them of the volume of sewerage that will be discharged from the site and obtain final approval.

8.4. STORMWATER DRAINAGE

The broad principles of the stormwater management philosophy account for the following:

- Compliance with the eThekwini Municipality stormwater management policy;
- Compliance with the National Water Act (Act No. 36, 1998);
- Current national and international best management practices; and

8.4.1. SITE DESCRIPTION

The Clairwood South Precinct site is currently zoned as public open space. This site consists of an open grass area which has been used as a soccer field. The site is predominantly covered in grass with thick bush in some areas. The site is flat with steep sloping banks along Roland Chapman Road on the northern side.

8.4.2. PROPOSED STORMWATER MANAGEMENT SYSTEM

SITE IMPACT ASSESSMENT

Without appropriately designed stormwater intervention measures, the proposed development plans would have the following detrimental effects upon natural storm flows:

- Increase in discharge volume due to an increase in hard surfaces and decreases in depression storage and infiltration, this is most evident at the Clairwood South precincts; and
- Increase in discharge rate (volume per unit time) due to increases in flow velocities along engineered channels and conduits.
Consequent damage could take the following forms:

- Localised flooding
- Increased soil erosion and sediment loads;
- Increased pollutant loads;
- Inundation of downstream properties

DESIGN STANDARDS

The following design standards have been adopted.

Guidelines For Human Settlement Planning And Design

In general, the proposed stormwater management system is designed in accordance with the Guidelines for Human Settlement Planning and Design, compiled by CSIR Building and Construction Technology & Department of Housing.

For residential land use, the recommended flood frequency for major systems is 1:50 years. A design frequency of between 1 to 5 years is recommended for the design of minor systems, however for these developments, a 1:10 year storm recurrence is deemed more appropriate due to their location in an urban area.

eThekwini Municipality Stormwater Management Policy

Stormwater management policy is driven by the eThekwini Municipality Coastal Engineering, Stormwater and Catchment Management Department, in conjunction with the Environmental Management Department.

The policy dictates the application of a dual drainage system, with the minor system (e.g. closed conduit systems) catering for frequent storm events and the major system (e.g. overland flow routes) for less frequent but severe storm events.

In terms of runoff quantity, the policy dictates that storm flows stemming from new developments shall not exceed the flows prior to such development having taken place. To this end, the 1:10 and 1:50 storm recurrence intervals have been defined as the two benchmarks.

Water Quality

Regarding runoff quality the policy dictates that adequate measures be instituted during the construction phase to minimise transportation and deposition of silt from the construction site during storm events.

Each development is individually assessed, based on proposed land use, and site specific requirements are prescribed.

8.4.3. DESIGN PROPOSAL

There are stormwater drainage systems available consisting of comprehensive pipe networks and manholes that provide drainage to roads and sites around the area where the development is proposed. The drainage system for the new development site will be designed to function with catchpits/ grid inlets and pipes that will be connected to the existing system at convenient locations. The on-site drainage will be designed to cater for the 1 in 10 year recurrence interval storm with provision of attenuation structures to accommodate the 1:50 year storm event.

The estimated stormwater pre-development and post-development flows that will be generated as a result of the densification development is reflected on the calculation sheets in Annexure C (Appendix E). The proposed internal layout for the stormwater reticulation within the site and the proposed connection point, into the existing stormwater reticulation, is shown on Drg. Nos. 344346/00/02SW in Annexure C (Appendix F). A 300mm diameter stormwater pipe is proposed for the internal reticulation within the site. The overriding principle in the design and
management of stormwater drainage is to replicate pre-development flow conditions in terms of runoff discharging into the existing stormwater system. In order to achieve this within the site, stormwater attenuation measures will need to be implemented.

In brief the proposed stormwater management system will consist of the following:

- A formalized pipe system for the access roads within each site.
- Attenuation/ Detention structures linked to the piped drainage system.
- Storm blocks as a method of detaining stormwater under parking areas.
- Stormwater detention method will be adopted at the Clairwood Precinct. The soccer field can be used as a detention areas for stormwater, the stormwater pipe system will be designed to include a back discharge pipe that will have an outlet into the soccer field during heavy storm events. Stone pitching to be used at stormwater outlet at the soccer field.
- A geotechnical investigation will have to be conducted in order to determine the soil type within the site as impermeable soils will not be able to allow infiltration of the stormwater.
- Subsoil drains will be installed behind all retaining walls.
- Drainage along roads and parking areas will be accommodated via catchpits/ grid inlets and a piped network and discharge into strategically located attenuation structures on the site, in line with the Sustainable Urban Drainage Systems (SUDS) Guidelines.

OTHER MITIGATION INITIATIVES

The proposed new developments will be predominantly medium to high density residential developments. The SUDS Guidelines outlines different sustainable drainage systems for the different development types that can be adopted within each site. Below is a brief description of two of the systems that can be adopted within the developments:

Green roofs – are vegetated roofs (Stahre, 2006; Wanielista et al., 2008). Their most common use is to absorb rainwater amongst other things. Green roofs also provide relief in densely developed areas and contribute to overall liveability. This drainage system is widely used in Singapore. These drainage measures can be considered for high density residential areas in all three sites.
Stormwater collection and reuse – also known as ‘rainwater harvesting’ (Figure 4.4.2) – refers to the temporary storage and reuse of rooftop and/or surface runoff (Melbourne Water Corporation, 1999). It aids in reducing stormwater flood peaks and provides extended detention (Parkinson & Mark, 2005; Scholz, 2006). It may be configured as either direct supply systems or gravity systems (Woods-Ballard et al., 2007; Garcia Maldonado, 2009). This measure is good for residential areas where water can be re-used for sanitary use and gardening.

**IMAGE 8.2: RAINWATER HARVESTING TANK, SELBORNE ESTATE, EAST LONDON**
(SOURCE: SUDS, MAY 2013)

8.5. **ELECTRICITY**

The electricity for the surrounding areas around the Clairwood South Precinct is supplied by ETekwini Municipality. A load estimate for the development was calculated using the Guidelines for Human Settlement Planning and Design. An assumed demand of 5kVA for each household and 20kVA for every 100m² of retail space was used for the calculation.

Table 8.3 below shows the estimated electricity demand figures for the development. The required number of transformers is also shown.

**TABLE 8.3: ESTIMATED ELECTRICITY DEMAND FIGURES**

<table>
<thead>
<tr>
<th>Development</th>
<th>Estimated Demand (kVA)</th>
<th>No. of Transformers (500kVA each) Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clairwood South Precinct</td>
<td>1488</td>
<td>4</td>
</tr>
</tbody>
</table>

During detailed design stage, the client and/or ETekwini Municipality Electricity Department will advise on the final figures to be used for the demand calculation.
8.6. SOLID WASTE REMOVAL

The site is located in a municipal area and solid waste will be removed by the EThekwini Municipality on a regular schedule using a waste bin system.

The bins for the new development will be removed from a central bin storage area located at convenient positions on the site with a stop and load space for the refuse removal truck.

Provision for recycling of waste on the site must be incorporated into the design of the sites and also for the collection of recycled waste by private contractors/operators.

8.7. CONSTRUCTING COST

The estimated construction cost for the proposed water, sewer and stormwater reticulation for the development is outlined in Annexure C (Appendix G) and also reflected on in Section 9.
9. PROJECT IMPLEMENTATION

9.1. INTRODUCTION

This section considers various aspects relating to the implementation of the project, including:

- Appropriate development approaches;
- Capital investment costs; and
- A development programme.

9.2. DEVELOPMENT APPROACHES

9.2.1. OPTIONS CONSIDERED

Within the very complex continuum of private-public partnerships there exists three basic options for the implementation of developments such as the King Edward Residential Precinct. The public-private sector partnership continuum is reflected in the Diagram below.

DIAGRAM 9.1: THE PUBLIC-PRIVATE PARTNERSHIP CONTINUUM

Source: Palmer, G (2009) adapted from Canadian Council for Public-Private partnerships; Deloitte
Within this continuum the three broad options then available are:

- Public sector development;
- Public private sector development;
- Private sector development.

While PPP have found their way into urban development, they are not without complexities. These issues, while not necessarily unique to social PPP, are perhaps more acute than for economic PPP.

Some of the complexities and challenges in social housing PPP are as follows (Susilawati & Armitage, 2004 as in Sobuza 2010):

- The main challenge in social housing PPP is the conflicting commercial and social focus of the different parties. The challenge here is to ensure sufficient revenue streams from the project to attract private sector involvement in a sector where affordability is problematic.
- The credit risk profile for housing PPP also varies considerably from that of other PPPs. Social housing projects are characterised as generally being smaller in scale than economic infrastructure projects (e.g. motorways, bridges, tunnels, etc.) and, by their very nature, also tend to be complex, particularly in terms of ongoing involvement with tenants (Susilawati & Armitage, 2004). Thus, private-sector bidders for social housing PPP projects are often presented with a situation where the financial rewards are less and the operational demands are more complex than for other infrastructure PPP projects.
- The transaction costs of developing and monitoring PPP contracts are normally higher than for conventional procurements. In the case of a housing PPP, the high bidding cost and the high operational costs (i.e. financing, risk and procurement costs) can question the financial viability of a PPP in social housing. For small scale projects, transaction costs can typically be high, particularly for cases where the procurement process is long and complicated. The capital value of individual housing projects may, therefore, not attract sufficient private sector interest.

Sobuza (2010) then concludes that PPPs present both opportunities and challenges for housing development initiatives. He, however, concludes that the experiences of developed countries, however, demonstrate that these challenges can be surmountable.

Considering the three development approaches available for the King Edward Residential Precinct the pros and cons of the various options are briefly reflected on.

<table>
<thead>
<tr>
<th>DEVELOPMENT APPROACH</th>
<th>PROS</th>
<th>CONS (CHALLENGES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Sector Development</td>
<td>Land already owned by public sector</td>
<td>eThekwini not geared for implementation and management of developments of such nature. Public sector focus almost exclusively on low income market</td>
</tr>
<tr>
<td></td>
<td>Capacity exist to manage planning and implementation.</td>
<td></td>
</tr>
<tr>
<td>Public Private Sector Partnership</td>
<td>Examples of successful land development PPPs already in place in eThekwini</td>
<td>As reflected on above PPPs generally not found to be suitable for social housing developments due to:</td>
</tr>
<tr>
<td></td>
<td>Private and public sector can make unique contributions to the development</td>
<td>- Conflicting commercial and social focus of parties;</td>
</tr>
<tr>
<td></td>
<td>Private sector understands the property market and can effectively respond to this.</td>
<td>- Risk profile of social housing projects not great;</td>
</tr>
<tr>
<td></td>
<td>Reduced risk for public and private sector</td>
<td>- Transaction costs higher than that for conventional PPPs.</td>
</tr>
</tbody>
</table>
### Development Approach

<table>
<thead>
<tr>
<th>PROS</th>
<th>CONS (CHALLENGES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role of public sector in ensuring objectives of project are met is</td>
<td>High risks for private sector developers and may therefore be difficult to attract.</td>
</tr>
<tr>
<td>significantly reduced. Private sector understands the property market</td>
<td>Role of public sector in ensuring objectives of project are met is significantly reduced.</td>
</tr>
<tr>
<td>and can effectively respond to this.</td>
<td></td>
</tr>
</tbody>
</table>

#### 9.2.2. An Appropriate Approach

Considering the above assessment it is then proposed that the King Edward Residential Precinct development should be a private sector development. The following conditions should, however, be adhered to in order to ensure municipal objectives are met:

- Land made available subject to appropriate densities and identified market targeted by the private sector.
- Development should proceed within two years of land being made available for development subject to environmental and land development applications.
- A developer with prior experience in this specific market should be engaged with.
- The successful bidder must propose innovative approaches to accommodating people in the specific market segment.
- Preference given to developers that will also participate in the ongoing management of the development.

It is further recommended that, in order to secure appropriate private sector interest in participating in a development of this nature, the following incentives relating to this specific initiative be considered:

- The making available of the land for the development;
- Provision of appropriate bulk infrastructure to the site boundary (as proposed in engineering services report); and
- The setting up of appropriate mechanism to ensure the processing of environmental, planning and building applications.

Further to this it is recommended that a rates rebate be considered for development of this nature, i.e. new high density development in priority corridors.

All of the above will increase the interest of private sector developers in projects of this nature, i.e. projects with lower returns and generally higher risks attached.
9.3. CAPITAL INVESTMENT COST

The capital investment cost for the development will be made up of the following basic components:

- Bulk Infrastructure costs
- Internal Infrastructure costs
- Building Costs
- Other Costs (Consultants / T&Cs).

Building construction cost is based on the rates as reflected in the Africa Property and Construction Handbook (AECOM 2013). The rates used are based on the following:

- Bulk Infrastructure costs: Engineering Services Report (where relevant)
- Internal Infrastructure costs: Engineering Services Report
- Building Costs: AECOM 2013
- Other Costs (Consultants / T&Cs).

The basic per square meter rate used for the construction process include the cost of appropriate building services, e.g. plumbing, electrical, etc., but exclude costs of site infrastructure development, parking, any future escalation, loss of interest, professional fees and Value Added Tax (VAT).
### TABLE 9.2: ESTIMATED CAPITAL DEVELOPMENT COST

<table>
<thead>
<tr>
<th>COMPONENT / ITEM</th>
<th>DESCRIPTION</th>
<th>AREA / UNIT</th>
<th>UNIT MEASURE</th>
<th>UNIT COST</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LAND COST</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acquisition of Site</td>
<td>Not relevant</td>
<td>1</td>
<td>Number</td>
<td></td>
<td>R 0</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>1</td>
<td>Number</td>
<td></td>
<td>R 0</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>R 0</td>
</tr>
<tr>
<td><strong>CONSTRUCTION COSTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential Units</td>
<td>Includes plumbing and electricity</td>
<td>19,159</td>
<td>m²</td>
<td>R 5,600</td>
<td>R 107,290,400</td>
</tr>
<tr>
<td>Retail Space</td>
<td></td>
<td>639</td>
<td>m²</td>
<td>R 6,500</td>
<td>R 4,153,500</td>
</tr>
<tr>
<td>Landscaping and Parking</td>
<td>Parking on grade, incl integral landscaping</td>
<td>8,233</td>
<td>m²</td>
<td>R 450</td>
<td>R 3,704,850</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>R 115,148,750</td>
</tr>
<tr>
<td><strong>INFRASTRUCTURE COSTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulk Water</td>
<td>Not required</td>
<td>1</td>
<td>R 0</td>
<td></td>
<td>R 0</td>
</tr>
<tr>
<td>Bulk Sanitation</td>
<td>Not required</td>
<td>1</td>
<td>R 0</td>
<td></td>
<td>R 0</td>
</tr>
<tr>
<td>Bulk Electricity</td>
<td>Not required</td>
<td>1</td>
<td>R 0</td>
<td></td>
<td>R 0</td>
</tr>
<tr>
<td>Water Infrastructure</td>
<td>Medium Pressure Pipes (110mm diameter)</td>
<td>697</td>
<td>m</td>
<td>R 887</td>
<td>R 618,239</td>
</tr>
<tr>
<td>Relocation of Existing Water Main</td>
<td>Relocation of 1200mm water main</td>
<td>60</td>
<td>m</td>
<td>R 11,285</td>
<td>R 677,100</td>
</tr>
<tr>
<td>Sanitation infrastructure</td>
<td>Sewers (160mm diameter)</td>
<td>697</td>
<td>m</td>
<td>R 1,357</td>
<td>R 945,829</td>
</tr>
<tr>
<td>Electricity Infrastructure</td>
<td>Substations</td>
<td>4</td>
<td></td>
<td>R 218,000</td>
<td>R 872,000</td>
</tr>
<tr>
<td>Stormwater infrastructure</td>
<td>Stormwater drainage (300mm diameter)</td>
<td>643</td>
<td>m</td>
<td>R 2,065</td>
<td>R 1,327,795</td>
</tr>
<tr>
<td>Stormwater Retention</td>
<td></td>
<td></td>
<td></td>
<td>R 200,000</td>
<td>R 200,000</td>
</tr>
<tr>
<td>Connection Costs</td>
<td>eThekwini to contribute</td>
<td>1</td>
<td>R 0</td>
<td></td>
<td>R 0</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>R 4,640,963</td>
</tr>
<tr>
<td><strong>TOTAL (EXCLUDING CONSULTANT FEES)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>R 119,789,713</td>
</tr>
<tr>
<td><strong>PROFESSIONAL FEES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional Fees (Survey, Architecture, Engineering, Construction, Legal)</td>
<td>@ 12% of development cost</td>
<td></td>
<td></td>
<td></td>
<td>R 14,374,766</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>R 14,374,766</td>
</tr>
<tr>
<td><strong>TOTAL CAPITAL DEVELOPMENT COST</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>R 134,164,479</td>
</tr>
</tbody>
</table>
The above capital development cost will translate into the following unit costs if different unit sizes are considered (current planning based on 60m² units).

**TABLE 9.3: ESTIMATED COST PER UNIT**

<table>
<thead>
<tr>
<th>Category</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Unit Cost</td>
<td>R338,833</td>
</tr>
<tr>
<td>Development Cost 60m² unit</td>
<td>R 406,600</td>
</tr>
<tr>
<td>Development Cost 50m² unit</td>
<td>R 338,833</td>
</tr>
<tr>
<td>Development Cost 40m² unit</td>
<td>R 271,067</td>
</tr>
</tbody>
</table>

The costing and the potential marketing of units based on the costing is to be reviewed once detailed architectural designs are in place.

### 9.4. IMPLEMENTATION PLAN

An indicative plan for the proposed project, based on the approach as proposed, is reflected in the table below. This Plan will have to be amended based on more detailed planning.
## TABLE 9.4: IMPLEMENTATION PLAN

<table>
<thead>
<tr>
<th>COMPONENTS / STEPS</th>
<th>ESTIMATE</th>
<th>YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PROJECT INITIATION</strong></td>
<td>3 months</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>Project Approval / Project Inception</td>
<td>3 months</td>
<td></td>
</tr>
<tr>
<td>Confirming availability of land</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engaging with potential public / private sector partners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approval of Project by Council</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finalise business plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land Assembly</td>
<td>6 months</td>
<td></td>
</tr>
<tr>
<td>Confirmation of land availability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Securing land for development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Council approval</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TENDER PROCESS</strong></td>
<td>6 months</td>
<td></td>
</tr>
<tr>
<td>Compile Developer Call for Proposals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issues Call for Proposals to Developers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjudicate Call for Proposals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Land availability) agreements with Preferred Bidder</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PLANNING AND CONCEPT DESIGN</strong></td>
<td>6 months</td>
<td></td>
</tr>
<tr>
<td>Access survey information</td>
<td>2 months</td>
<td></td>
</tr>
<tr>
<td>Geotechnical assessment</td>
<td>2 months</td>
<td></td>
</tr>
<tr>
<td>Preliminary environmental assessment</td>
<td>To review</td>
<td></td>
</tr>
<tr>
<td>Required environmental specialist studies</td>
<td>2 months</td>
<td></td>
</tr>
<tr>
<td>Concept design</td>
<td>To review/detail</td>
<td></td>
</tr>
<tr>
<td>Bulk infrastructure planning</td>
<td>Review</td>
<td></td>
</tr>
<tr>
<td>Engineering service planning</td>
<td>3 months</td>
<td></td>
</tr>
<tr>
<td>Traffic Impact Assessment</td>
<td>Completed</td>
<td></td>
</tr>
<tr>
<td><strong>ENVIRONMENTAL IMPACT ASSESSMENT</strong></td>
<td>9 months</td>
<td></td>
</tr>
<tr>
<td>Prepare basic assessment report (BAR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Submit BAR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acknowledge receipt of BAR</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td>COMPONENTS / STEPS</td>
<td>ESTIMATE</td>
<td>YEAR</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>----------------</td>
<td>------</td>
</tr>
<tr>
<td>Accept BAR</td>
<td>30 days</td>
<td></td>
</tr>
<tr>
<td>Grant / Refuse EIA</td>
<td>30 - 90 days</td>
<td></td>
</tr>
<tr>
<td>Notify applicant of decision</td>
<td>2 days</td>
<td></td>
</tr>
<tr>
<td>Applicant notify I&amp;AP of decision</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td>Proceed with Land Development application</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LAND DEVELOPMENT APPLICATION (REZONING)</td>
<td>9 months</td>
<td></td>
</tr>
<tr>
<td>Submit Land Development Application</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advisory of commencement of process</td>
<td>7 days</td>
<td></td>
</tr>
<tr>
<td>Notification of registration of application</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td>Public notification</td>
<td>30 days</td>
<td></td>
</tr>
<tr>
<td>Public sector comments</td>
<td>60 days (from registration)</td>
<td></td>
</tr>
<tr>
<td>Consider and make determination</td>
<td>60 days</td>
<td></td>
</tr>
<tr>
<td>Sitting of Tribunal</td>
<td>90 days</td>
<td></td>
</tr>
<tr>
<td>Tribunal approval</td>
<td>30 days</td>
<td></td>
</tr>
<tr>
<td>Notification of decision</td>
<td>21 days</td>
<td></td>
</tr>
<tr>
<td>DETAILED DESIGN</td>
<td>6 months</td>
<td></td>
</tr>
<tr>
<td>Architectural Design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landscaping</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other preparatory work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BUILDING PLAN APPROVAL</td>
<td>6 months</td>
<td></td>
</tr>
<tr>
<td>CONSTRUCTION</td>
<td>18 months</td>
<td></td>
</tr>
<tr>
<td>OCCUPATION OF UNITS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
BIBLIOGRAPHY:


Sobuza, Y. 2010. *Social housing in South Africa: Are public private partnerships (PPPs) a solution?*. Research project submitted in partial fulfilment of MBA degree.