SOUTHERN PUBLIC TRANSPORT CORRIDOR
DENSIIFICATION PILOT PROJECT - BUSINESS PLAN
UMLAZI W ACCOMMODATION – OCTOBER 2014

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SUPPORTED BY:
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DENSIFICATION FRAMEWORK AND ACTION PLAN FOR
THE SOUTHERN PUBLIC TRANSPORT CORRIDOR

UMLAZI W ACCOMMODATION PRECINCT BUSINESS PLAN

OCTOBER 2014

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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 **Umlazi W Accommodation Precinct**.

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 282 high density accommodation / residential units Umlazi W, centrally located withing the larger Umlazi area, catering for the student accommodation and the lower middle income market segments. This Section of Umlazi W was originally developed as the CBD for Umlazi as a whole. The land on which the proposed project is to be located is owned by Ithala, a parastatal, with existing commercial developments in the node. This development illustrates how space in existing already developed areas can be better utilised. No major challenges in terms of environmental approval or the provision of engineering services is anticipated.

The units introduced within the Umlazi W section will be located in 4 story residential blocks. Each unit has a unique placing relating to the streets and the surrounding facilities and residential neighbourhood. Despite the increased intensity, the buildings provide a human scale to the precinct and offers increased surveillance to the neighbouring facilities within the precinct.

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
- 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 is the Unit W of Umlazi forming an integral part of the larger Umlazi area and 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 units;
- 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 / 1,582 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 emphasised 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 unachievable, 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 Umlazi W Accommodation Precinct 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 rail) 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 /MEREBANK 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
- Rossburgh 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 Umlazi Accommodation Precinct is located in Unit W of Umlazi in the eThekwini Municipality. 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 Umlazi Precinct is located north of the Mangosuthu Highway. It is connected to the Mangosuthu Highway by Zwe Madlala Drive which borders the precinct to the north and east. Gumede Road borders the site to the west. The site is also served by an access road along the south of the precinct, with a proposed realignment linking it to Veni Yeni Road. Zwe Madlala Drive is classified as a District Distributor road and Gumede Road as a District Collector road.

3.3. SITE DESCRIPTION

3.3.1. OVERVIEW

The Site is referred to as follows:

- Erf: 868 Umlazi
- Address: 162 Zwe Madlala Drive, Umlazi W

The overall site is 11.13 hectares and includes various commercial and government uses.

IMAGE 3.1: ITHALA SHOPPING CENTRE AND SURROUNDING FACILITIES
3.3.2. OWNERSHIP AND VALUE

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

- Ownership: iThala
- Municipal valuation: R22 000 000
- Availability: Sports Club Lease Cancelled - site available (reserved)

The landowner has not been engaged regarding the project as it was the view that opportunities must first be explored and considered by the planning team before Senior Management of eThekwini will engage with the landowner with regard to the opportunities presented by the site.

3.3.3. CURRENT USE

The site is currently offers residents with access to a range of commercial, social and government services.

3.3.4. ZONING

The site is currently zoned as mixed use.

3.4. THE SITE IN THE CORRIDOR

3.4.1. LAND USE IN THE CORRIDOR

The Umlazi Corridor is largely characterised by urban formal and urban informal residential settlement, with pockets of commercial development along the rail and road network.

The Umalzi S section contains a number of large pieces of state owned land which are used for educational facilities. A new commercial node has been identified at the KwaMnyandu Station where construction is currently underway for a retail centre. Two other commercial/retail nodes are identified; one in Umlazi V section contain Umalzi Mega City and the second at Umalzi W.

Within the residential component, limited densification has occurred relating to some infill projects, hostel upgrading and expansion.

3.4.2. ZONING IN THE CORRIDOR

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

<table>
<thead>
<tr>
<th>TABLE 3.1: ZONING IN THE CORRIDOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURRENT ZONING (PRIMARY ZONES)</td>
</tr>
<tr>
<td>Residential</td>
</tr>
<tr>
<td>Mixed Use</td>
</tr>
<tr>
<td>Utility</td>
</tr>
<tr>
<td>Educational</td>
</tr>
<tr>
<td>Civic</td>
</tr>
</tbody>
</table>
DIAGRAM 3.1: CURRENT LAND USE IN THE CORRIDOR
DIAGRAM 3.2: LAND USE FRAMEWORK
4. PROJECT CONCEPT / PLAN

4.1. DEVELOPMENT RATIONALE

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 envisions 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.

The Umlazi corridor currently as well as in the future will act as the residential core of the southern corridor with current average densities of 29 du/ha, at an average of 6 du/ha higher than the rest of the corridor.

The future residential corridor should promote residential 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 busses will be greater as there will be less passengers to cater for.

- The proposals for the Umlazi W Section 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.

The basic concept for the Umlazi W Section is to provide infill development to the existing ithala shopping complex. Over the years interest in the area has shifted from W section to Umlazi Mega City. Therefore, the infill development is proposed to;

- Increase the capacity of the site through the introduction of residential blocks, to create a more vibrant, safe space for users and the surrounding community;
- Utilise the land parcel more efficiently. Land within the Umlazi corridor is limited, therefore infill/ redevelopment or densification opportunities should be encouraged;
- Create a new energy and catalysts for development in the historic Town Centre;
- Provide student housing stock to assist in the existing shortfall in the area.

The primary use for the infill development within the precinct is residential, with limited complimentary mixed use or retail components on the ground floor. The proposed development is envisaged to stimulate new growth and development in and round the node as well as being a new energy to the Umlazi precinct.
4.2. **DESIGN CONCEPT**

**SITE CADASTRAL**
The Umlazi W provides an opportunity for infill and densification within the existing development. As a result new site cadastral has been configured within the existing roadways and parking facilities of the existing shopping centre. Four additional sub-divisions have been created.

**MOVEMENT AND CIRCULATION**
The existing movement and circulation of the site forms the bases of the new development. Additional linkages and parking courtyards are introduced in association with the new development units.

**LAND USE**
The additional development designed for the Umlazi W section is purely residential. The introduction of residential uses complements the existing land uses of the site and is in line with the surrounding residential precinct.

**BUILT FORM**
The units introduced within the Umlazi W section are 4 story residential blocks. Each unit has a unique placing relating to the streets and the surrounding facilities and residential neighbourhood. Despite the increased intensity, the buildings provide a human scale to the precinct and offers increased surveillance to the neighbouring facilities within the precinct.

**LANDSCAPING**
The greening and landscaping of the site plays an integral component to the precinct. The internal park provide relief within the high density residential cluster allowing all residents, as well as the surrounding communities access to open space/ recreational amenities. Landscaping along the street edge provides protection from the elements and provides much needed vegetation to the area.
4.3. DESIGN CONSIDERATIONS & SITE DEVELOPMENT PLAN

The Umlazi W section is designed to facilitate a high density residential units within an existing residential neighbourhood. The increased residential densities fall in 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 of an increased 41 du/ha.

Therefore, the precinct is design to introduce maximum residential thresholds within an existing commercial node and residential neighbourhood. Increased residential accommodation will provide support for the surrounding tertiary facilities University.

Due to the existing development, the proposed development occupies the current ‘baggy space’, therefore allowing maximum use of the site. The site allows for three blocks to be created. Each block contains 4 story walk-up apartments, with a central parking courtyard. The units within the blocks consist of bachelor and two bedroom flats. The proposed units are designed to accommodate the middle to lower income groups.

A key feature of the infill development of the precinct is the park located centrally within the site. The Umlazi area as a whole lacks public open space for residents, therefore the introduction of a communal park within a public environment provides a beneficial feature for the greater community.
The introduction of residential blocks and a public park within the existing Umlazi W section ensures a safer environment for those utilising the facilities. 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.

Despite the fact that the Umlazi W section is not physically on or attached to an IRPTN station, the site presents great opportunities for infill and densification in alignment with the IRPTN plans. The Umlazi W section can still promote effective densities in close proximity to stations and tertiary institutions. The site is approximately 1 kilometre from the Lindokuhle rail station.

Access and parking for the residential units is provided off the existing internal circulation system. Parking is restricted to internal courtyards and limited, one parking bay for every three units. Restricted parking for the development is in support of the proposed IRPTN system.

Due to the increased demand for student accommodation in the Umlazi areas, the residential units have been tailored to suit such needs. Therefore warranting the reduction is parking provision.
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
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 282 units within the existing Umlazi W Section. The overall density for precinct is 138 du/ha, which will address the current project concerns and fall in line with the IRPTN strategy.

**TABLE 4.1: UMLAZI W ACCOMMODATION**

<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>3504</td>
<td>59</td>
<td>1182</td>
<td>3546</td>
<td>1</td>
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<td>290 Du/ha</td>
</tr>
<tr>
<td>3</td>
<td>5021</td>
<td>110</td>
<td></td>
<td>6612</td>
<td>1.3</td>
<td>219 Du/ha</td>
</tr>
<tr>
<td>4</td>
<td>8008</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20424</td>
<td>282</td>
<td>1608</td>
<td>16980</td>
<td></td>
<td></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 commercial node of Umlazi Section W 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).

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.

5.2.4. THE ETHEKWINI DENSIFICATION STRATEGY

In 2012, the eThekwini Municipality commissioned Royal HaskoningDHV (Formally SSI Engineers and Environmental Consultants (Pty)) to undertake 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 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 Southern Transport Densification Framework (eThekwini 2014) suggests that the Umlazi corridor will consist of some of the highest residential densities within the Southern Public Transport Corridor. The area is primarily residential in nature; the plan envisages a high density residential corridor consisting of reduced informal settlements and clusters of high intensity mixed uses nodes located at strategic points within the sub-corridor.

The development of a high quality residential corridor along the Mangosuthu Highway will require the redevelopment of a portion of the existing low density residential development. It is proposed that the Umlazi sub-corridor becomes a powerful residential corridor with intermittent commercial nodes. The commercial nodes proposed are identified as:

- The upgrading of the existing commercial facilities at Umlazi V section;
- KwaMyandu Station and King Zwelithini sports precinct;
- Lindokuhle station precinct; and
- Umlazi station precinct.

COMMERCIAL

A number of commercial nodes currently exist at strategic locations and intersection of within the Umlazi area, specifically along the Mangosuthu Highway. The existing commercial nodes are to be been formalised and expanded through the following proposals:

- It is proposed that the commercial facilities at Umlazi V section are formalised and extended, creating a commercial, residential and social facilities cluster.
- The high traffic areas around stations generate commercial interest, therefore all stations along the Umlazi routing should have a varied commercial presence. Typically, the larger the station, the greater the commuter numbers, the larger demand and consequent provision for larger commercial facilities.
Commercial nodes are located at KwaMyandu, Lindokuhle and the Umlazi Stations. The commercial nodes at KwaMyandu and Umlazi Stations present greater opportunities as they will be developed as major public transport nodes. A shopping complex is currently under construction at the KwaMyandu, which will form part of the station, and link into the existing King Zwelithini sports precinct.

Lindokuhle station is an associate station which will only be fed by NMT routes, therefore providing a lower level of commercial facilities.

The commercial node at Umlazi will be supported by a full intermodal interchange inclusive of commercial, office and residential opportunities. The Umlazi intermodal facility will be supported by High Density Residential Development.

HIGH DENSITY RESIDENTIAL

A band of High Density Residential development is encouraged along the length of the Mangosuthu Highway. The range of densities and intensity of the residential development will vary according to the particular site context. It is proposed an average typology of 4 – 6 story flats be developed in this high density residential zone.

All existing residential development outside of the main Mangosuthu Highway will remain, additional rights may be granted to residential neighbourhoods adjacent to the High Density Residential strip.
DIAGRAM 5.1: DESIFICATION FRAMEWORK ZONING
The following provides the proposed zoning tables for the land holdings surrounding the Umlazi W Precinct within the Umlazi sub-corridor. (The full tables for the corridor are within the annexures in the Land Use Framework Report prepared preceding this document.)

**TABLE 5.1: PROPOSED ZONING FOR THE 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 4 (High Density Residential)</td>
<td>This is a new zone for inclusion within an amended Town Planning Scheme. For redevelopment of existing Town Centre</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>1.8 Total Residential and office use component will be 1.3</td>
<td>100%</td>
<td>6 Storeys</td>
<td>F: 0 BTL S: 0 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, Creche, 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>IRPTN Mixed-Use Residential 4 (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>1.2 Residential and office use component will be 1.00</td>
<td>80%</td>
<td>4 - 6</td>
<td>F: 0 BTL 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, Creche, 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>
</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.

Diagram 5.2: PROPOSED LAND USE & ZONING

The current development at the Umzaki W Section has been ‘compromised’ with the introduction of Umlazi Mega City at the entrance of Umlazi. The precinct is currently underutilised and therefore it is proposed that infill development in the form of residential apartments be introduced.

In order to accommodate the infill the site would need to be rezoned to ‘IRPTN Mixed Use Residential’. IRPTN Mixed Uses residential establishes a zone for a mix of residential, office and ground floor shopping uses to service the needs of the residents. The current zoning allows Mixed Use, however the intensity and future vision for the precinct requires the zoning to be changed.

The redevelopment of the site into IRPTN Mixed Use Residential units is viewed as desirable as it:

- Promotes and fulfills the eThekwini Municipalities Densification Strategy (2013);
- Acknowledges the need for densification along the IRPTN corridors, of which the Umzaki region forms one of the primary identified routes, known as the C2 rail corridor;
- 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; and
- Consolidates a critical node within the Southern Public Corridor through the redevelopment of a under developed, abandoned site which can present safety and security issues for the hospital as well as the surrounding residential community.

The plan provides a regeneration strategy for the Umzaki W Section to stimulate growth and redevelopment of the old Town Centre. The key to the strategy is that all new development occurs within the ‘baggy’ spaces of the existing precinct.
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 was based 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 was 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 Umlazi W Accommodation Precinct 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 Umlazi W Accommodation Precinct will be focussed and where the private sector developer will have an interest.

In specifically Umlazi, the indication has been that a major shortage of student accommodation exists serving the educational facilities in Umlazi. The ability to provide this type of accommodation in an already densely built up area is limited and ad hoc arrangements are currently made. The Umlazi W Accommodation Precinct thus provides a unique opportunity to also fulfil in this need.

Over and above this the demand for lower middle income housing and student accommodation 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. Only 27 properties in close proximity or in the Umlazi component of the corridor was traded in the first part of 2013, but this is already substantially higher than number recorded for previous years. The property transaction database confirms a vibrant property market in all components of the corridor.

<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><strong>CORRIDOR AS A WHOLE</strong></td>
<td><strong>24</strong></td>
<td><strong>39</strong></td>
<td><strong>49</strong></td>
<td><strong>135</strong></td>
<td><strong>247</strong></td>
</tr>
</tbody>
</table>

The table below reflects on land prices in the Corridor should the full redevelopment of already developed sites be considered.

<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><strong>CORRIDOR AS A WHOLE</strong></td>
<td><strong>R 10,514</strong></td>
<td><strong>R 1,462</strong></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 better utilising existing development land 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. FINDINGS OF PRELIMINARY ASSESSMENT

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.

A basic environmental assessment conducted confirmed that Umlazi W Accommodation Precinct will not require a Basic Assessment to be carried out. Other developments, located in Umbilo and Clairwood respectively, however, triggered GNR 544 and GNR 546 of the National Environmental Management Act (107 of 1998) (NEMA) 2010 Environmental Impact Assessment (EIA) Regulations.

The Umlazi node does not require a Basic Assessment procedure as it currently accommodates Ithala Business precinct and therefore cannot be considered as undeveloped or vacant. The Umlazi node however has the potential to trigger a Water Use License Application (WULA) as there is a wet area located 200m from the proposed site. In addition, it should be confirmed whether the required expansion of electrical transmission and distribution associated with the Umlazi node would fall within the nodal re-development or whether this is required to be a separate Basic Assessment with eThekwini Electricity Department as the applicant.

6.2. IMPLEMENTATION PLAN INPUTS

Although a Basic Assessment is not required the following specialist studies have been identified as potentially necessary to provide the required detail to facilitate planning and environmental permitting requirements.

<table>
<thead>
<tr>
<th>STUDY</th>
<th>SCOPE</th>
<th>TIMEFRAME</th>
<th>ESTIMATED COST</th>
</tr>
</thead>
<tbody>
<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>Engineering Fees</td>
<td></td>
</tr>
<tr>
<td>STUDY</td>
<td>SCOPE</td>
<td>TIMEFRAME</td>
<td>ESTIMATED COST</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>1 month</td>
<td>R 26,900</td>
</tr>
<tr>
<td>Water Use Licence Application (WULA)</td>
<td>The National Water Act (36 of 1998) provides for fundamental reformation of legislation relating to water resources and use. A desktop analysis using eThekwini Municipality Geographic Information System data indicated that a wet area was located less than 500m (across Zwe Madlala Drive) from the Umlazi node. This is a potential trigger for a WULA in terms of Section 22 of the Water Act. An Integrated Water and Waste Management Plan (IWWMP) must be compiled in support of the Integrated Water Use Licence (IWULA) application if required by the Department of Water and Sanitation. The objective of the IWWMP is to comprehensively define the water use and waste management practices of the proposed development and the potential impacts on local water resources, as well as highlight the water use related practices requiring formal authorisation. The IWWMP must be prepared in parallel with the Basic Assessment and requires the drafting of a technical report in line with the IWWMP structure. This also includes the filling out of application forms which need to be signed by the applicant and landowner.</td>
<td>4-5 months</td>
<td>R80,000 – R110,000</td>
</tr>
<tr>
<td>Wetland Delineation and Functional Assessment</td>
<td>A screening will be required by a specialist to confirm the presence of a wetland. A fresh water assessment will be required to provide a reference to wetland features which may be potentially impacted by the proposed development and also provide a reference to development implementation so as to minimise and negate development impacts. This assessment includes mapping and descriptions of the freshwater features in the proposed development footprint, floodline delineations, conservation value, sensitivity and current state of the freshwater/wetland features within and related to the development footprint.</td>
<td>1 month</td>
<td>R 45,000</td>
</tr>
<tr>
<td>Environmental Management Plan (EMP)</td>
<td>An EMP will be required for Umlazi node to ensure compliance with best practice in order to mitigate impacts during the construction phase of the proposed development. This should be included in the contractor tender documents.</td>
<td>1 month</td>
<td>R 18,000</td>
</tr>
</tbody>
</table>
6.3. CONCLUSION

The assessment contributed to the development of an Implementation Framework and an Area Specific Plan for the Umlazi W Accommodation Precinct. 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**

The Umlazi Precinct is located north of the Mangosuthu Highway. It is connected to the Mangosuthu Highway by Zwe Madladla Drive which borders the precinct to the north and east. Gumede Road borders the site to the west. The site is also served by an access road along the south of the precinct, with a proposed realignment linking it to Veni Yeni Road. Zwe Madladla Drive is classified as a District Distributor road and Gumede Road as a District Collector road.

Current traffic volumes along Zwe Madladla Drive are approximately 360 PCUs/hr and 150 PCUs/hr in the AM and PM peak directions. Site access is proposed primarily via the ZweMadladla Drive and Veni Yeni Road intersection. The precincts low vehicle trip generation during the AM peak hour (140 PCU) and the existing low traffic volumes suggests that the intersection is able to cope with the future estimated traffic volumes (see further analysis). Gumede Road will provide additional access capacity to the precinct.
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 Umlazi, using TMH 17 and SATGR respectively.

**TABLE 7.1: TRIP GENERATION BY SITE – TMH17 TRIP GENERATION RATES**

<table>
<thead>
<tr>
<th>Site</th>
<th>Residential Units</th>
<th>Retail Bulk</th>
<th>Vehicle 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>59</td>
<td>1182</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>113</td>
<td>426</td>
<td>41</td>
</tr>
<tr>
<td>3</td>
<td>110</td>
<td>0</td>
<td>39</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>282</td>
<td>1608</td>
<td>104</td>
</tr>
</tbody>
</table>

**TABLE 7.2: TRIP GENERATION BY SITE – SATGR TRIP GENERATION RATES**

<table>
<thead>
<tr>
<th>Site</th>
<th>Residential Units</th>
<th>Retail Bulk</th>
<th>Vehicle 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>59</td>
<td>1182</td>
<td>56</td>
</tr>
<tr>
<td>2</td>
<td>113</td>
<td>426</td>
<td>96</td>
</tr>
<tr>
<td>3</td>
<td>110</td>
<td>0</td>
<td>91</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>282</td>
<td>1608</td>
<td>243</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 (Annexure B).

**DIAGRAM 7.1: TRIP DISTRIBUTION: UMLAZI W PRECINCT**
7.3.3. LOCAL TRAFFIC INTERSECTIONS

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

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.

The proposed re-alignment of Veni Yeni Road to serve the precinct is expected to have limited impact on traffic operation with both current and future scenarios operating at LOS B.

The Mangosuthu Highway – Zwe Madladla Road intersection currently operates at an acceptable LOS C but this will reduce to LOS F by 2030. 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 is currently, and 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.

The following intersection upgrade measures will improve traffic operations to LOS C for the 2030 Development scenario:

- The addition of a dedicated left turning lane from the western approach of Mangosuthu Highway;
- A dedicated left turning lane from the northern approach of Zwe Madladla;
- A shared straight and right turning lane (existing lane) from the eastern approach of Mangosuthu Highway.

<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>Mangosuthu Highway and Zwe Madladla Drive</td>
<td>AM</td>
<td>C (F)</td>
<td>F(F)</td>
<td>F(F)</td>
<td>F(F)</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td>B</td>
<td>B</td>
<td>B</td>
<td>E(F)</td>
</tr>
<tr>
<td>Zwe Madladla Drive and Veni Yeni Road (New road alignment and intersection configuration, therefore existing not assessed)</td>
<td>AM</td>
<td>-</td>
<td>-</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td>-</td>
<td>-</td>
<td>B</td>
<td>B</td>
</tr>
</tbody>
</table>

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

Public transport is an essential component to the successful densification of eThekwini’s Southern Corridor. The Umlazi 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 contains series of EMME trip assignments which illustrate the estimated demand for two scenarios for the 2030 forecast year:

1. High growth scenario;
2. 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.

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. Assuming that the total vehicle trip generation may be calculated using SATGR and the factored private vehicle trip generation (40% of SATGR demand as discussed in section 4.2) may be estimated using TMH17, then the remaining trips (60%) can be assumed to be served by public transport. This will balance the overall demand and account for the envisaged shift in demand from private vehicles to public transport. A vehicle occupancy of 1.5 was then be applied to estimate the person trip generation of 210 trips produced and 72 trips attracted to the precinct. Table 7.4 below tabulates the estimated public transport vehicle trip demand for the precinct.

<table>
<thead>
<tr>
<th>Site</th>
<th>Residential Units</th>
<th>Retail Bulk</th>
<th>Vehicle 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>59</td>
<td>1182</td>
<td>32</td>
</tr>
<tr>
<td>2</td>
<td>113</td>
<td>426</td>
<td>55</td>
</tr>
<tr>
<td>3</td>
<td>110</td>
<td>0</td>
<td>52</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>282</td>
<td>1608</td>
<td>139</td>
</tr>
</tbody>
</table>
7.4.3. PRECINCT NON-MOTORISED TRANSPORT FACILITIES

Most public transport journeys begin as a 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 Umlazi Precinct Development is the distance to Lindokuhle Rail Station. Pedestrians currently walk 1.4km in order to access the rail station. Considering the objective to make public transport easily accessible to precinct, this distance may be considered too great. It is therefore recommended that planned IRPTN feeder route along Zwe Madladla Drive extend to the Rail station. This is illustrated overleaf.
DIAGRAM 7.2: NMT PROPOSALS

- Proposed feeder route extension to provide improved access to Lindukwe Rail Station
- Pedestrian route
  - Traffic Bollards at entrance and exit to prevent vehicle access
- Proposed public transport stop location

Current pedestrian route to station = 1.4km
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 7.5 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.

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 dependent 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.

### TABLE 7.5: PRECINCT PARKING REQUIREMENTS

<table>
<thead>
<tr>
<th>Development Details</th>
<th>Parking Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site</td>
<td>Dwelling Units</td>
</tr>
<tr>
<td>1</td>
<td>59</td>
</tr>
<tr>
<td>2</td>
<td>113</td>
</tr>
<tr>
<td>3</td>
<td>110</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>282</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.
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 Umlazi site area fall under the jurisdiction of eThekwini Municipality and is indicated on Drg. No. 344346/00/03G in Annexure C (Appendix A). Potable water for the areas around the Umlazi Precinct is supplied by the Umlazi 2 Reservoir located within the development site.

8.2.2. PROPOSED RETICULATION

eThekwini Water has indicated that the new proposed development can be supplied by the same reservoir that are currently supplying surrounding the sites, subject to certain conditions. See attached pre- approval letter 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 area 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 developments within the Umlazi Precinct.

Table 8.1 below outlines the expected average water consumption for the additional new developments (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>Umlazi Precinct</td>
<td>12.1</td>
</tr>
</tbody>
</table>

The proposed internal layout for the water reticulation, for the site, along with the proposed connection points are shown in Drg. No. 344346/00/03W in Appendix C. A 110mm diameter class 12 mPVC pipe is proposed for the internal reticulation within the site.

It is proposed that the water connection, for the Umlazi Precinct, be off the 150mm diameter watermain along Zwe Madlala 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 this development 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 in Umlazi as reflected in Drg. No. 344346/00/03G in Annexure C (Appendix B). The Umlazi W section area drains in a south-easterly direction into an existing 450 mm diameter trunk sewer main which runs along the Umlazi River and ultimately discharges at the Southern Treatment Works in Merebank.

The proposed new densification yields for the site was 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):
TABLE 8.2: SEWER GENERATION FIGURES

<table>
<thead>
<tr>
<th>Development</th>
<th>Estimated Daily Flows (l/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Umlazi Precinct</td>
<td>11.2</td>
</tr>
</tbody>
</table>

The proposed internal sewer reticulation for the site and the proposed connection points is shown on Drg. No. 344346/00/03S in Annexure C (Appendix D). A 160mm diameter uPVC pipe is proposed for the internal reticulation on the sites. It is proposed that the sewer connection for the Umlazi Precinct be off the 160mm diameter sewer line next to the community hall that runs across Zwe Madlala Road to connect to the 450mm diameter sewer trunk main about 1.3km downstream. The eThekwini Sanitation department indicated that this 160mm diameter sewer pipeline at Umlazi will need to be upgraded to in order to accommodate the additional demand from the development.

eThekwini Water and Sanitation Department confirmed that there is sufficient capacity along the trunk sewer main that will be servicing the site and at the respective Treatment Works to accommodate the additional demand from the development.

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 Umlazi Precinct is currently a developed mixed use area. The land cover is predominant hard surfaces which comprises of roof tops, internal access roads and parking. The topography of the site is fairly flat with a few areas sloping in a north direction on along Zwe Madlala Road.

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, 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; and
- 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 Umlazi Precinct. The drainage system for the new development sites will be designed to function with catchpits/ grid inlets and pipes that will be connected to the existing system at a convenient location. 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. No. 344346/00/03SW 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 three sites, 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 the site.
- Attenuation/Detention structure linked to the piped drainage system.
- Storm blocks as a method of detaining stormwater under parking areas.
- Within the Umlazi Precinct, an attenuation pond will be constructed to accommodate additional storm volumes. The required pond size is 500m² at 0.5m depth. The proposed pond is 588m² at 0.5m depth; the proposed size of this pond is big enough to accommodate stormwater in the event of heavy storms.
- A geotechnical investigation will have to be conducted in order to determine the soil type at 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 development 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 development:

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.

IMAGE 8.1: INTENSIVE GREEN ROOF, CBD, CAPE TOWN (SOURCE: SUDS, MAY 2013)
Stormwater collection and reuse – also known as ‘rainwater harvesting’ – 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.

8.5. ELECTRICITY

The electricity for the surrounding areas around the development precincts is supplied by EThekwini 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 Umlazi Precinct development. The required number of transformers is also shown.

<table>
<thead>
<tr>
<th>Development</th>
<th>Estimated Demand (kVA)</th>
<th>No. of Transformers (500kVA each) Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Umlazi Precinct</td>
<td>1732</td>
<td>4</td>
</tr>
</tbody>
</table>

During detailed design stage, the client and/or EThekwini 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. CONSTRUCTION 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 Umlazi W Precinct the pros and cons of the various options are briefly reflected on.

### TABLE 9.1: DEVELOPMENT APPROACH PROS AND CONS FOR ETHEKWINI MUNICIPALITY

<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 Capacity exist to manage planning and implementation.</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>
</tbody>
</table>
| Public Private Sector Partnership | Examples of successful land development PPPs already in place in eThekwini Private and public sector can make unique contributions to the development Private sector understands the property market and can effectively respond to this. Reduced risk for public and private sector | As reflected on above PPPs generally not found to be suitable for social housing developments due to:  
  - Conflicting commercial and social focus of parties;  
  - Risk profile of social housing projects not great;  
  - Transaction costs higher than that for conventional PPPs. |
### Development Approach

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

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#### 9.2.2. An Appropriate Approach

Considering the above assessment it is then proposed that the Umlazi W Accommodation Precinct should be dealt with as a private sector development, with potentially Ithala acting as a private sector developer or getting a private sector developer on board for the development. It is suggested that the following conditions should, proposed for the development of the King Edward and Clairwood Precincts, should also be applied here, 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 obviously to be considered by Ithala;
- 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>R 0</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td>Number</td>
<td>R 0</td>
<td></td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>R 0</td>
<td></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>16,980</td>
<td>m$^2$</td>
<td>R 5,600</td>
<td>R 95,088,000</td>
</tr>
<tr>
<td>Retail Space</td>
<td></td>
<td>1,608</td>
<td>m$^2$</td>
<td>R 6,500</td>
<td>R 10,452,000</td>
</tr>
<tr>
<td>Landscaping and Parking</td>
<td>Parking on grade, incl integral landscaping</td>
<td>4,710</td>
<td>m$^2$</td>
<td>R 450</td>
<td>R 2,119,500</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>R 107,659,500</td>
<td></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></td>
<td>R 0</td>
<td>R 0</td>
</tr>
<tr>
<td>Bulk Sanitation</td>
<td>Not required</td>
<td>1</td>
<td></td>
<td>R 0</td>
<td>R 0</td>
</tr>
<tr>
<td>Bulk Electricity</td>
<td>Not required</td>
<td>1</td>
<td></td>
<td>R 0</td>
<td>R 0</td>
</tr>
<tr>
<td>Water Infrastructure</td>
<td>Medium Pressure Pipes (110m diameter)</td>
<td>548</td>
<td>m</td>
<td>R 887</td>
<td>R 486,076</td>
</tr>
<tr>
<td>Sanitation infrastructure</td>
<td>Sewers (160mm diameter)</td>
<td>546</td>
<td>m</td>
<td>R 1,357</td>
<td>R 740,922</td>
</tr>
<tr>
<td>Relocation of existing 150mm diameter sewer pipeline</td>
<td>206</td>
<td></td>
<td></td>
<td>R 1,234</td>
<td>R 254,204</td>
</tr>
<tr>
<td>Upsizing of downstream sewer pipe 250mm diameter</td>
<td>1,300</td>
<td></td>
<td></td>
<td>R 1,369</td>
<td>R 1,779,440</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>374</td>
<td>m</td>
<td>R 2,065</td>
<td>R 772,310</td>
</tr>
<tr>
<td>Stormwater Retention</td>
<td></td>
<td></td>
<td></td>
<td>R 300,000</td>
<td>R 300,000</td>
</tr>
<tr>
<td>Connection Costs</td>
<td>eThekwini to contribute</td>
<td>1</td>
<td></td>
<td>R 0</td>
<td>R 0</td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>R 5,204,952</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL (EXCLUDING CONSULTANT FEES)</strong></td>
<td></td>
<td></td>
<td></td>
<td>R 126,408,186</td>
<td></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>1</td>
<td></td>
<td>R 13,543,734</td>
<td></td>
</tr>
<tr>
<td><strong>Sub-Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>R 13,543,734</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL CAPITAL DEVELOPMENT COST</strong></td>
<td></td>
<td></td>
<td></td>
<td>R 126,408,186</td>
<td></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>Average Unit Cost</th>
<th>R335,004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development Cost 55m² unit</td>
<td>R 409,449</td>
</tr>
<tr>
<td>Development Cost 45m² unit</td>
<td>R 335,004</td>
</tr>
<tr>
<td>Development Cost 35m² unit</td>
<td>R 260,559</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 ammended based on more detailed planning.
### TABLE 9.4: IMPLEMENTATION PLAN

<table>
<thead>
<tr>
<th>COMPONENTS / STEPS</th>
<th>ESTIMATE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PROJECT INITIATION</strong></td>
<td>YEAR</td>
</tr>
<tr>
<td>Project Approval / Project Inception</td>
<td>3 months</td>
</tr>
<tr>
<td>Engage with Ithala re availability of land</td>
<td></td>
</tr>
<tr>
<td>Agreement with Ithala (if necessary)</td>
<td></td>
</tr>
<tr>
<td>Approval of Project by Council</td>
<td></td>
</tr>
<tr>
<td>Finalise business plan</td>
<td></td>
</tr>
<tr>
<td>Land Assembly</td>
<td>6 months</td>
</tr>
<tr>
<td>Confirmation of land availability</td>
<td></td>
</tr>
<tr>
<td>Securing land for development</td>
<td></td>
</tr>
<tr>
<td>Ithala approval</td>
<td></td>
</tr>
<tr>
<td><strong>TENDER PROCESS</strong></td>
<td>6 months</td>
</tr>
<tr>
<td>Compile Developer Call for Proposals</td>
<td></td>
</tr>
<tr>
<td>Issues Call for Proposals to Developers</td>
<td></td>
</tr>
<tr>
<td>Adjudicate Call for Proposals</td>
<td></td>
</tr>
<tr>
<td>(Land availability) agreements with Preferred Bidder</td>
<td></td>
</tr>
<tr>
<td><strong>PLANNING AND CONCEPT DESIGN</strong></td>
<td>6 months</td>
</tr>
<tr>
<td>Access survey information</td>
<td>2 months</td>
</tr>
<tr>
<td>Geotechnical assessment</td>
<td>2 months</td>
</tr>
<tr>
<td>Preliminary environmental assessment</td>
<td>To review</td>
</tr>
<tr>
<td>Required environmental specialist studies</td>
<td>2 months</td>
</tr>
<tr>
<td>Concept design</td>
<td>To review/detail</td>
</tr>
<tr>
<td>Bulk infrastructure planning</td>
<td>Review</td>
</tr>
<tr>
<td>Engineering service planning</td>
<td>3 months</td>
</tr>
<tr>
<td>Traffic Impact Assessment</td>
<td>To review</td>
</tr>
<tr>
<td><strong>ENVIRONMENTAL ASSESSMENTS</strong></td>
<td>6 months</td>
</tr>
<tr>
<td>Water Use Licence Application</td>
<td></td>
</tr>
<tr>
<td>Environmental Management Plan</td>
<td></td>
</tr>
<tr>
<td>COMPONENTS / STEPS</td>
<td>ESTIMATE</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>LAND DEVELOPMENT APPLICATION (REZONING / SUBDIVISION)</td>
<td>9 months</td>
</tr>
<tr>
<td>Submit Land Development Application</td>
<td></td>
</tr>
<tr>
<td>Advisory of commencement of process</td>
<td>7 days</td>
</tr>
<tr>
<td>Notification of registration of application</td>
<td>14 days</td>
</tr>
<tr>
<td>Public notification</td>
<td>30 days</td>
</tr>
<tr>
<td>Public sector comments</td>
<td>60 days (from registration)</td>
</tr>
<tr>
<td>Consider and make determination</td>
<td>60 days</td>
</tr>
<tr>
<td>Sitting of Tribunal</td>
<td>90 days</td>
</tr>
<tr>
<td>Tribunal approval</td>
<td>30 days</td>
</tr>
<tr>
<td>Notification of decision</td>
<td>21 days</td>
</tr>
<tr>
<td>DETAILED DESIGN</td>
<td>6 months</td>
</tr>
<tr>
<td>Architectural Design</td>
<td></td>
</tr>
<tr>
<td>Engineering Services</td>
<td></td>
</tr>
<tr>
<td>Landscaping</td>
<td></td>
</tr>
<tr>
<td>Other preparatory work</td>
<td></td>
</tr>
<tr>
<td>BUILDING PLAN APPROVAL</td>
<td>6 months</td>
</tr>
<tr>
<td>CONSTRUCTION</td>
<td>18 months</td>
</tr>
<tr>
<td>OCCUPATION OF UNITS</td>
<td></td>
</tr>
<tr>
<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.