URBAN REGENERATION FRAMEWORK:
KWAMASHU A (THEMBALIHLE & DUFFS ROAD)

14 August 2015
This report represents a working draft report for the:

Final Urban Regeneration Framework:
Phase 5

Finalised on 14 August 2015 for:
eThekwini Municipality

By:

Royal HaskoningDHV (PTY) Ltd with input from Architect and
1 Introduction

1.1 Project Background

Hostels or Community Residential Units (CRU’s), in South Africa are notorious for the significantly inadequate planning and development that resulted in the construction of so called “temporary” single sex communities within contained separate development townships, neighbourhoods or suburbs. In addition the responsibility for planning, development and management of these areas has not been clear until relatively recently, thus resulting in a lack of investment and in further degradation and deterioration of the physical and social living environments in these areas. Housing designed for migrant male workers now accommodates a wide range of urban families in settlements wholly inadequate for normal family and community life.

The KwaMashu A (Thembalihle / Duffs Road) Hostel, situated in the study area, is no different and is possibly much worse off in physical environmental terms due to the initial lack of basic spatial planning and the absolute lack of investment in basic access and social infrastructure at its initial establishment. This unacceptable physical situation is complicated by the significant informal densification and particularly complex social and political dynamic in the area which has also complicated renewal and upliftment initiatives.

However, despite these severe physical and social conditions and constraints, KwaMashu A is home to a community of some 40,000 inhabitants with established living patterns and livelihoods and territorial structures which consist of individuals and families who are defiantly trying to either eke out a living and / or uplift themselves to a better quality of life.

The role of this project therefore, as part of the wider overall redevelopment process of the KwaMashu CRU being undertaken by the Municipality, has been to identify and prioritise the role of infrastructure, facilities and land use planning in assisting and supporting the community in its myriad upliftment efforts and endeavours. As such, the identification of short and long term physical “game changing” interventions and preconditions for upliftment has been a primary objective of this project.

This project was not a long project (i.e. 6 months) and ties into the wider and on-going developmental process being driven by the Municipality. As such its focus has been to undertake the following as an important input into the development and investment process going forward:

- Develop a strong and inclusive development concept for the study area that takes into consideration local community needs as well as wider contextual development imperatives
- Identify key land parcels and or project sites that have the potential to meet the socio-economic needs of the inhabitants
- Translate the outputs of the above into a land use framework that is compatible with municipal systems but that takes into consideration the nuance of the area and that can guide both public and private development in the future to ensure that there is land for facilities that will ensure a balanced community area
- Generate appropriate urban design tools to guide development across the study area, as well as, produce conceptual designs for priority areas that could be developed quickly
- Produce an implementation plan for the physical infrastructure proposals that flow from the land use planning and urban design

All of the above has been undertaken with an acute sensitivity for the social dynamic in the area and in a manner that indicates a respect for and understanding of the fragile nature of the existence of individuals and families in the area. As much as it has been important for the project to result in the development of physical infrastructure it has been more important for the project process to contribute to the development of trust and confidence in the Municipality as a key development stakeholder.

1.2 Project Approach

Given the relatively short time frame of this project it was as important to get the “planning” right as it was to get the “plan” right. In other words in order to get relevant development projects identified, accepted and implemented quickly, it was necessary to involve local community stakeholders early in the needs analysis and project identification process, as well as, obtain early and realistic budgetary commitment from the relevant implementing stakeholders for the priority and “game changing” interventions.

The project approach adopted by the Royal HaskoningDHV Team has been to assist in preparing the eThekwini Municipality for action, to build on the work already done in the area and to work with officials and key stakeholders to develop the plan.

As such, the approach has sought to avoid the "analysis paralysis" trap that a number of planning studies can fall into and rather to focus on the "what", "how" and "when" of an implementation plan guided by a robust but sustainable development framework and strategy.
1.3 Context of This Report

The project was structured into six iterative phases culminating in a final Regeneration Framework Plan for the KwaMashu A (Thembalihle/Duffs Road) area in Phase 6.

Each phase builds on the work done in the preceding phase:

- Phase 1: Inception Phase
- Phase 2: Situational Analysis Summary and Concept Plan
- Phase 3: Land Use Management Framework
- Phase 4: Project Site Identification
- Phase 5: Detailed Urban Design
- Phase 6: Implementation Budgeting & Phasing

The following diagram (Figure 1-1) provides a diagrammatic overview of the project plan and methodology.

1.4 Stakeholder Engagement

Stakeholder engagement for this project has predominately involved engagements with Municipal & Other Governmental Stakeholders as part of the Project Steering Committee and key individual meetings with relevant officials throughout the project cycle.

Community stakeholder engagement included the introduction the project to the Community Leadership structures of KwaMashu A (23 January 2015) as well a workshop on the Concept and Strategic Focus (03 June 2015).

Unfortunately despite numerous attempts, the project team was unable to secure a meeting with a broader community representative group during the project cycle and this should be included as part of the process of implementing the plan.

Figure 1-1: Conceptual Diagram of the Project Methodology
2 Policy Environment and Context

2.1 National, Provincial and Local Policy

A plethora of legislation, policies and strategies from national and provincial government govern and influence future spatial planning and development in the Greater KwaMashu area together with a number of previous studies and initiatives.

These include, but are not limited to:

Table 2.1: Applicable Policy, Legislation and Planning

<table>
<thead>
<tr>
<th>National and Provincial Legislation and Policy</th>
<th>Municipal Policy and Planning</th>
<th>Local Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA Constitution</td>
<td>KwaZulu-Natal Planning and Development Act</td>
<td>Northern Spatial Development Plan (2009 and 2012)</td>
</tr>
<tr>
<td>PRASA Modernisation Project</td>
<td>eThekwini City Densification Strategy (2013)</td>
<td>DUT Socio-Economic Needs Assessment Report (ongoing)</td>
</tr>
</tbody>
</table>

Each of these policies and to some extent the legislation emphasise the following key development principles to which the KwaMashu Urban Regeneration Project has responded:

- alignment with the principles contained within the National Spatial Development Plan, Millennium Development Goals, etc.
- the promotion of high density and quality living environments
- increase in mixed use/multi-use spaces
- basic needs of citizens in KwaMashu must be met
- clustering of economic, social and transport facilities is required to maximize thresholds and to ensure the maximum and efficient use of resources
- development must not compromise environmental assets
- development is not to be “business as usual”

Specific interventions for KwaMashu A include:

- an emphasis on transit orientated development linked to public transport stations
- role of the area is residential
- de-institutionalisation the hostels
- spatial, social and economic integration of the hostels and their residents with the surrounding neighbourhoods
- NPTC recommended further studies for Thembalihle and Duffs Road Stations
2.2 eThekwini’s Spatial Development Framework

The ‘key choices’ identified in the City’s Integrated Development Plan are realised spatially across the municipally and reflected in the Spatial Development Framework (SDF).

The strategic focus areas for the SDF are (eThekwini Municipality, 2014):

- A compact city model, underpinned by two important concepts:
  - Urban core – central urban area which generally has servicing capacity and thus the opportunity for densification and support thresholds for a range of services industry and public transport.
  - Urban Development Corridor with an Urban Development line – a tool to curb urban sprawl, promote compaction, public transport, protect environmental assets and prevent inefficient expenditure on infrastructure.

- Rural areas are those areas where development is a mixture of traditional land tenure interlaced with subsistence and commercial agriculture and supported by basic infrastructure.

- Subject to servicing and the phasing limitations on bulk infrastructure, the strategic intent of the SDF is for urban expansion to occur along the Northern Corridor of the City.

Key directives for this planning exercise outlined in the SDF include:

- Identification of areas for mixed use development and residential infill contained within the urban development line
- Investment in smaller urban investment nodes which provide convenient and efficient access to commercial, community and social facilities thereby reducing the need to travel long distances
- Densification and intensification of land uses along the Integrated Rapid Public Transport Network (IRPTN) and within existing nodes and corridors
- Emphasis on integration, accessibility and convenience in more densely populated urban areas
- Promotion and preservation of key environmental assets

Figure 2-1: eThekwini SDF
2.3 Key National and Provincial Development Initiatives

2.3.1 Urban Integration and City Support Programme

As of 2013, National Treasury has introduced grant funding and budgeting linked to spatial targeting. The concept involves the identification of a number of Integration Zones which provide the basis for making medium and long-term capital commitments to an area. This is intended to support the development of efficient, sustainable and inclusive development in the country’s metropolitan municipalities.

The spatial focus of this targeting initiative is the identification of a CBD, major Townships, other Townships, and the connections between these three types of spaces or elements, and an Integration Zone. This system is termed the Urban Network.

eThekwini has accessed approximately R700 million from National Treasury in terms of the Neighbourhood Development Partnership Grant (NDPG) to facilitate investments in the township areas.

The programme has been progressing well and investments have been made at Bridge City, the Mpumalanga New Town Centre, Umlazi, Clermont-KwaDabeka and KwaMashu.

The KwaMashu Integration Zone includes 3 sub-precincts, i.e. KwaMashu Town Centre, Bridge City Town Centre and KwaMashu A (Figure 2-2).

2.3.2 PRASA Train Station Modernisation Programme

PRASA is currently implementing a Modernisation Programme for the eThekwini region.

This involves substantial improvements to the north-south rail corridor with respect to the acquisition of additional train-sets, station upgrades (specifically Duffs Road and Thembalihle for the study area) and a recapitalization of the rolling stock (trains) as well as capacity upgrades to the signalling and infrastructure systems.

Further improvements include a redesign of rail services with an emphasis on improving travel journey times and managing overcrowding, the introduction of user-friendly timetables. Improved safety and security and improved operational safety dimensions.

Figure 2-2: KwaMashu Integration Zone
3 Overview of the Study Area

3.1 Regional Context

The KwaMashu Study area is located within the Greater Inanda Ntuzuma KwaMashu (INK) residential complex of eThekwini Municipality to the north of Durban. The Greater INK area is predominately residential in character and is situated approximately 20km from the Durban CBD. The study area for this project is located at the south-eastern corner of the Greater INK complex. As such it is well connected to the City via the KwaMashu Highway, north-south rail corridor and Malandela Road, but access within INK is constrained and costly.

Figure 3-1: Regional Context
3.2 The Study Area

The study area is located within KwaMashu and is as illustrated below. The area is described by Queen Nandi Drive, Dumisani Makhaya Road, Curnick Ndlovu (KwaMashu) Highway and the Malandela Highway including the Crossroads development.

The study area falls predominately into two wards, Ward 39 and 40, although smaller portions fall into Ward 46, Ward 54 and Ward 102.

The study area is 258ha.

3.3 Photographic Overview

Walkups

Row Housing

Detached Housing

Figure 3-2: Study Area

1 Site photographs from site visit in 2008
Informal Structures

Formal Business Activity

Informal Business Activity

Natural Environment

Public Spaces

Worship Areas
4 Demographic Profile

4.1 Population

The population for the study area is estimated to be between 46 590 to 54 241 people.

According to StatsSA (2011) the population estimate is 46 590 for the study area which represents 1.4% of the eThekwini municipal population and 9.5% of the Greater INK population.

80.4% of the population is located in KwaMashu A, 17.8% in KwaMashu B and 1.7% in Duffs Road.

Table 4.1: Population (Census 2011)

<table>
<thead>
<tr>
<th></th>
<th>Total Population</th>
<th>% of eThekwini</th>
<th>% of Greater INK</th>
<th>% of Study Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>eThekwini</td>
<td>3 442 244</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Greater INK</td>
<td>490 138</td>
<td>14.2%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Study Area</td>
<td>46 590</td>
<td>1.4%</td>
<td>9.5%</td>
<td>-</td>
</tr>
<tr>
<td>Duffs Road</td>
<td>807</td>
<td>-</td>
<td>-</td>
<td>1.7%</td>
</tr>
<tr>
<td>KwaMashu B</td>
<td>8 313</td>
<td>-</td>
<td>-</td>
<td>17.8%</td>
</tr>
<tr>
<td>KwaMashu A</td>
<td>37 470</td>
<td>-</td>
<td>-</td>
<td>80.4%</td>
</tr>
</tbody>
</table>

In 2013, eThekwini Municipality appointed DUT to undertake a land-use and socio-economic study for the KwaMashu A area only. According to this report, the population for KwaMashu A was estimated at 45 121. This represents a 20% higher estimate than the Census data.

Table 4.2: Population with DUT Values

<table>
<thead>
<tr>
<th></th>
<th>Total Population</th>
<th>% of eThekwini</th>
<th>% of Greater INK</th>
<th>% of Study Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Area</td>
<td>54 241</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Duffs Road</td>
<td>807</td>
<td>-</td>
<td>-</td>
<td>1.5%</td>
</tr>
<tr>
<td>KwaMashu B</td>
<td>8 313</td>
<td>-</td>
<td>-</td>
<td>15.3%</td>
</tr>
<tr>
<td>KwaMashu A</td>
<td>45 121</td>
<td>-</td>
<td>-</td>
<td>83.2%</td>
</tr>
</tbody>
</table>

To deal with this discrepancy it is recommended that a range be used for different population scenarios in the Development Framework stage.

2 Statistically, there is no residential land use in this the Cross roads precinct and therefore it has been excluded from the population figures.

4.2 Households and Household Size

According to the census data, there are 21 965 households in the study area. This represents an average occupancy rate of between 1.9 and 4.8 persons per household. Densities are between 6.6 and 140 households per hectare or 18 to 274 persons per hectare.

Table 4.3: Households, Occupancy Rates and Density (Census 2011)

<table>
<thead>
<tr>
<th></th>
<th>Households</th>
<th>Occ Rate</th>
<th>Area (ha)</th>
<th>HH/ha</th>
<th>Pers/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>eThekwini</td>
<td>953 899</td>
<td>3.6</td>
<td>16.7</td>
<td>16.7</td>
<td></td>
</tr>
<tr>
<td>Greater INK</td>
<td>126 427</td>
<td>3.9</td>
<td>66.6</td>
<td>66.6</td>
<td></td>
</tr>
<tr>
<td>Study Area</td>
<td>21 965</td>
<td>2.2</td>
<td>257</td>
<td>86.6</td>
<td>165.0</td>
</tr>
<tr>
<td>Duffs Road</td>
<td>250</td>
<td>3.2</td>
<td>38</td>
<td>6.6</td>
<td>18.4</td>
</tr>
<tr>
<td>KwaMashu B</td>
<td>1 738</td>
<td>4.8</td>
<td>68</td>
<td>25.6</td>
<td>114.9</td>
</tr>
<tr>
<td>KwaMashu A</td>
<td>19 977</td>
<td>1.9</td>
<td>134</td>
<td>149.0</td>
<td>273.7</td>
</tr>
</tbody>
</table>

Figure 4-1: Population Density
4.3 Household Income

Approximately 80% of households in the study area earn less than R38 000 per annum (i.e. <R3,200) per month. This drops to less than 35% in Duffs Road and just over 55% in KwaMashu B.

Table 4.4: Annual Household Income

<table>
<thead>
<tr>
<th>Subsidy</th>
<th>Income Band</th>
<th>Study Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDP</td>
<td>R0 - R1 600</td>
<td>14.5%</td>
</tr>
<tr>
<td></td>
<td>R1 228 801 - R 2 457 600</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td>R 614 001 - R 1 228 800</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>R 307 601 - R 614 400</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>R 153 801 - R 307 600</td>
<td>29%</td>
</tr>
<tr>
<td></td>
<td>R 76 401 - R 153 800</td>
<td>162%</td>
</tr>
<tr>
<td></td>
<td>R 38 201 - R 76 400</td>
<td>1920%</td>
</tr>
<tr>
<td></td>
<td>R 19 601 - R 38 200</td>
<td>2278%</td>
</tr>
<tr>
<td></td>
<td>R 9 601 - R 19 600</td>
<td>3311%</td>
</tr>
<tr>
<td></td>
<td>R 4801 - R 9 600</td>
<td>7 322%</td>
</tr>
<tr>
<td></td>
<td>R 1 - R 4 800</td>
<td>1 449%</td>
</tr>
<tr>
<td></td>
<td>No income</td>
<td>7 680%</td>
</tr>
</tbody>
</table>

4.4 Household Affordability

The low income levels in the area indicate what types of housing finance models would be appropriate in the area and essentially indicate that there needs to be a 50/50 split between RDP and CRU housing models.

Table 4.5: Income Bands (Individual Monthly Income)

<table>
<thead>
<tr>
<th>Subsidy</th>
<th>Income Band</th>
<th>Duffs</th>
<th>B</th>
<th>A</th>
<th>Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDP</td>
<td>R0 - R1 600</td>
<td>14.5%</td>
<td>29.6%</td>
<td>51.4%</td>
<td>49.3%</td>
</tr>
<tr>
<td>CRU</td>
<td>R 800 - R 3 500</td>
<td>67.9%</td>
<td>61.9%</td>
<td>47.2%</td>
<td>48.6%</td>
</tr>
<tr>
<td>Social Housing</td>
<td>R1500 - R7 500</td>
<td>10.8%</td>
<td>5.9%</td>
<td>0.8%</td>
<td>1.3%</td>
</tr>
<tr>
<td>FLISP</td>
<td>R 0 - R15 000</td>
<td>6.8%</td>
<td>2.6%</td>
<td>0.6%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Private Sector</td>
<td>&gt;R15 000</td>
<td>6.8%</td>
<td>2.6%</td>
<td>0.6%</td>
<td>0.8%</td>
</tr>
</tbody>
</table>
5 Assessing KwaMashu A’s Performance

5.1 Regeneration?

In attempting to make sense of what is happening in the study area, the Project Team has asked itself the question who, and/or what, needs to be regenerated where, how and when? The question was asked in order to be clear as to what the project focus was and also in order to revisit their approach to, understanding, and planning for renewal in the study area.

Regeneration can be defined as being a set of development interventions directly related to the performance of the study area as a “platform” or “stage” that would effectively accommodate and enable the day to day activities of the residents of the study area and that would continue to provide a “platform” or “stage” for the area’s continued/sustainable performance as a residential neighbourhood and inter-modal transport node for the local population.

In other words regeneration revolves around ensuring that the physical, social, economic and institutional environment within the project area adequately provides the means for residents to meet their daily needs and provide them with the opportunity to enjoy the amenities of the study area.

The work of urban theorist and urban planner Kevin Lynch in his book “Good City Form” was used as a basis to structure the strategic assessment and evaluation of the performance of the project area. Lynch’s work revolved around the identification and definition of a set of dimensions (or criterion) that could be used to measure or evaluate the performance a City or part thereof in terms of its meaning for its inhabitants and users and in terms of how it meets human needs. This work, by Lynch’s own admission, is a contribution to the broader and ongoing discourse relating to how we identify and achieve “a sense of better” with regard to the making and remaking of human settlements.

The “performance dimensions” that Lynch identified are summarized in Figure 5-1

Renewal then, for the Project Team, means the improvement of the performance of the urban and natural environment of KwaMashu A in terms of the dimensions described above so that the quality of life and experience of individuals and communities who visit KwaMashu A is measurably uplifted.

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**Figure 5-1: Lynch’s Performance Dimensions**

- **ACCESS**
  - The ability to reach other persons, places, resources, services and information i.e. adequacy of the movement networks to link people and opportunity, the availability of, and “reachability” of, resources and services in terms of time and cost.

- **VITALITY**
  - The degree to which the form of the area supports the vital functions and biological requirements of human beings i.e. this would relate to aspects such as availability of water, clean air, energy, waste removal and food. It also relates to safety of person from hazards, disease and environmental pollution and to the maintenance of the balance between urban living and access to sustainable natural areas.

- **SENSE**
  - The degree to which the area can be clearly perceived and to which it connects to the values of its residents i.e. the landmarks, features and character of the places and built form that provide identity, orientation and meaning for its inhabitants.

- **FIT**
  - The degree to which the form and capacity of the area matches the pattern and quantity of activity of the residents i.e. the manner in which the spaces, places, buildings and infrastructure that make up the living environment accommodate the activities of the community with respect to their work, play and home life.

- **CONTROL**
  - The degree to which the use of, creation of and management of spaces can be controlled by those who use them i.e. this refers to the community and institutional capacities and processes and the manner in which they permit and enable individuals and communities to contribute to the shaping of their living environments.
5.2 Strategic Focus and SWOT Analysis

As part of the process of integrating the Project Team identified the strengths, weaknesses (internal issues), opportunities and threats (external issues) (SWOT) to development in the study area and through a workshop process collectively identified what it considered would be the key issues facing the redevelopment of the study area.

Figure 5-2: Project Team Key Issues Identification at Workshop

The issues were grouped or arranged using the performance dimensions articulated by Lynch (Table 5.1).
## Table 5.1: Strategic Integrated Assessment

<table>
<thead>
<tr>
<th><strong>ACCESS</strong></th>
<th><strong>VITALITY</strong></th>
<th><strong>SENSE</strong></th>
<th><strong>FIT</strong></th>
<th><strong>CONTROL</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The ability to reach other persons, places, resources, services and information. (Capacity and Quality of Access and Movement Networks and Systems)</td>
<td>The degree to which the form of the area supports the vital functions and biological requirements of human beings. (Condition of Water, Air, Soil, etc.)</td>
<td>The degree to which the area can be clearly perceived and to which it connects to the values of its residents (Quality of Spatial Structure and of Urban Form)</td>
<td>The degree to which the form and capacity of the area matches the pattern and quantity of activity of the residents (Capacity and Quality of Social and Public Infrastructure, Buildings and Spaces)</td>
<td>The degree to which the use of, creation of, and management of spaces can be influenced by those who use them (Capacity and Quality of Community Institutional Capacity)</td>
</tr>
</tbody>
</table>

### Strategic Focus

#### Key Trends

- On-going changes to regional mobility networks i.e. MR577, new metropolitan commuter Rail Spine and new BRT routes
- Significant emphasis and investment to Rail based and BRT Public Transport systems
- Increasing car ownership – aspiration of local population linked to emerging middle class
- Increase in regional traffic activity due to developments such as Bridge City, Mount Moriah etc., increasing car ownership and general densification
- Introduction of Intelligent Transport Systems

- Increase in Invasive Alien Plant Species (loss of natural habitat / ability to provide eco services)
- Increasing levels of air pollution sources – transportation, in efficient waste disposal
- Increasing noise pollution sources - transportation
- Reduction in functionality of open space – due to on-going asset erosion
- Climate change – may have impacts on the condition and extent of natural resource assets base, increase in flooding occurrences, increase in heat “traps”
- Human settlements policy producing impacts on structure and form of new settlements
- Public transportation restructuring interventions are providing opportunity for new urban structure, identity and character
- Increased investment in climate change mitigation provides opportunity for securing open space assets and protection of landscape assets
- Heritage policy providing increasing awareness and protection of heritage assets
- Loss of vegetation and associated landscape quality potential
- Regional and metropolitan restructuring e.g. relocation and or establishment of new mixed use commercial and social hubs and nodes i.e. urban systems networks
- Emphasis on higher density residential development
- Change in demography – “shape” and size of resident and / or working communities
- Diversity of needs for housing within urban locations i.e. form short term rent to private ownership
- Swing to supply of more sustainable infrastructure, buildings and operating systems
- Focus on Development Management and Urban Management Coordination and alignment across all spheres of government and parastatal
### ACCESS
- the ability to reach other persons, places, resources, services and information.
  (Capacity and Quality of Access and Movement Networks and Systems)

### VITALITY
- the degree to which the form of the area supports the vital functions and biological requirements of human beings.
  (Condition of Water, Air, Soil, etc.)

### SENSE
- the degree to which the area can be clearly perceived and to which it connects to the values of its residents
  (Quality of Spatial Structure and of Urban Form)

### FIT
- the degree to which the form and capacity of the area matches the pattern and quantity of activity of the residents
  (Capacity and Quality of Social and Public Infrastructure, Buildings and Spaces)

### CONTROL
- the degree to which the use of, creation of, and management of spaces can be influenced by those who use them
  (Capacity and Quality of Community Institutional Capacity)

### KEY ISSUES
- Restricted access from study area to regional road network
- Integration of the emerging Public Transportation Systems and NMT
- Inadequate Bus and/or Taxi Terminal facilities at key transportation intermodal nodes
- Incomplete and un-integrated NMT systems and facilities to link area with emerging PT systems or provide internal pedestrian circulation
- Pedestrian safety and security due to lack of infrastructure
- Poor linkage between sub-precincts and within the study area

- Decreasing environmental quality – water, air, microclimate
- Downstream water quality and pollution
- Costs associated with impacts mitigation, e.g. siltation/flooding/vegetation replacement
- Undefined and unmanaged open space system
- Impacts related to capacity, condition and design of bulk and reticulation water, sanitation and storm water infrastructure
- Capacity and condition of bulk and reticulation infrastructure for electricity

- Poorly articulated character and identity for districts and precincts, buildings and spaces, i.e. townscaping
- Poorly defined gateways and entrances, i.e. legibility and imageability
- Lack of clearly defined and articulated public spaces that physically and visually link and structure spaces and places
- Absence of landscaping, public art and street furniture
- Protection and enhancement of historic buildings and spaces

- Disparity between sub-precincts with regard to condition and performance of local water and sanitation services
- Impact of dysfunctional local reticulation of KwaMashu on surrounding areas
- Provision of NMT infrastructure
- Inadequate public transportation terminal infrastructure
- Lack of capacity of social infrastructure for increasing local and working population, i.e. parks, schools, clinics etc.
- Access to quality public green space for residents, Lack of availability of public land for provision of facilities
- Lack of infrastructure capacity to accommodate provision of basic services (i.e. DSW emergency)
- Provision of sufficient and appropriate accommodation choices for diverse community
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<td>- Distinctive topographical features in ridgelines and river provide opportunity for visual structure and orientation.</td>
<td>- Some local existing local level facilities e.g. social welfare and associated services</td>
<td>- Identifiable community structures and diversified representation</td>
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<td>- Well located Duffs Road and Thembalihle rail stations</td>
<td>- Minor stream systems in west, central and east of study area that could be rehabilitated to provide flood protection, feature recreation space and green lungs</td>
<td>- Substantial vegetation that could be used to retain or enhance landscape character</td>
<td>- Road reserves in established neighbourhoods can accommodate proper NMT Facilities but not in central area</td>
<td>- Ability of community to provide housing and economic activity opportunities</td>
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<td>- Duffs Road Station is a major integrating asset by virtue of its intermodal function along the northern rail line that links the area to the metro and the wider region</td>
<td>- Established recreation spaces / fields that could support functionality of open space system</td>
<td>- Variation / diversity of district or neighbourhood identities that could be enhanced</td>
<td>- Established reticulation for water, sanitation, storm water and electricity services in Egidweni, Amakhosinei and Duffs Road that could be upgraded and extended to assist in servicing central areas</td>
<td>- Ability of community to protect recreation space form settlement</td>
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Royal HaskoningDHV (14 August 2015)
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### WEAKNESSES

**(Inherent weaknesses of the study area)**

- Very limited vehicular and pedestrian access points to surrounding access and mobility systems of Mandela, MR 577 and Queen Nandi Drive
- Limited road and pedestrian networks make pedestrian movement very difficult and dangerous
- Inadequate lower order road network and suburban “cul de sac” road layout reduces permeability within neighbourhoods
- Limited land for public transport facilities
- Limited crossings between east and west banks of the area
- Poor road surface condition
- Insufficient capacity of roads to accommodate existing population
- Poor urban management resulting in litter and illegal dumping impacts
- Hazardous condition of communities settled in floodplains
- Inadequate infrastructure in central study area leads to impacts on natural resources and quality of water, air
- Limited and poorly defined and demarcated public space for public and community activity/events
- Poor definition between public and private space leading to lack of imageability and legibility of the environment, reduced security and poor structure of public space
- Existing housing typologies in central portions of the site are banal and lack structure
- Lack of records relating to important historic and community places and buildings
- Limited land for expansion, decanting or relocation of housing or other social facilities and for public open space
- Very limited infrastructure capacity for water, sanitation or storm water and electricity in central parts of study area
- Limited social facility capacity for health, education, social welfare and public administration in the study area
- Inadequate public reserves for roads and NMT infrastructure, particularly in the central parts of the study area.
- Spatial structure networks are inadequate or inappropriate for efficient pedestrian, or cycle oriented movement and activity
### ACCESS
- the ability to reach other persons, places, resources, services and information. 
  *(Capacity and Quality of Access and Movement Networks and Systems)*

### VITALITY
- the degree to which the form of the area supports the vital functions and biological requirements of human beings. 
  *(Condition of Water, Air, Soil, etc.)*

### SENSE
- the degree to which the area can be clearly perceived and to which it connects to the values of its residents 
  *(Quality of Spatial Structure and of Urban Form)*

### FIT
- the degree to which the form and capacity of the area matches the pattern and quantity of activity of the residents 
  *(Capacity and Quality of Social and Public Infrastructure, Buildings and Spaces)*

### CONTROL
- the degree to which the use of, creation of, and management of spaces can be influenced by those who use them  
  *(Capacity and Quality of Community Institutional Capacity)*

### OPPORTUNITIES
- Excellent location with respect to regional accessibility and mobility networks
- Establish links between New public transportation nodes
- Open Space linkage along stream
- Capitalise on redesign of higher order road systems and interchanges / intersections to provide increased access to study area
- Capitalise on increase in pedestrians and public transport users (both visitors and residents) that could move through the study area
- Integration of the local movement network into the emerging metropolitan facilities and systems surrounding the site
- Rehabilitation of the water course and surrounding open space system to form an important component of the Local, Regional and Metropolitan Open Space System as well as to contribute to local community upliftment through employment
- New and / or Re - development to utilise green infrastructure and green buildings principles and technology
- Additional bulk water supply can be easily added
- Strong planning legislation / Comprehensive legislation / eThekwini Open Space Framework in place to inform and guide local and regional decisions
- Utilisation of new development to create new structure
- Utilise upgrading of surrounding roads to provide landscaping along routes (especially high volume pedestrian routes and high order roads) to contribute to gateways, legibility, imageability and sense of place of the study area
- Investment in different building typologies that could establish a clearer territoriality and that will support a sense of ownership/ stewardship for public space and infrastructure
- Co-ordinated landscape elements related to surrounding new development and upgrading projects: paving, street furniture, signage, art and tree planting to improve quality of spaces and establish identity
- Redevelopment of Crossroads and MR 577 BRT Stations can provide gateway for, and linkage elements into the site
- Upgrading of rail stations provide opportunities for new gateway features
- Momentum from regional development priorities and pressure could be used to restructure urban form and provide new or additional facilities
- Utilisation of alternative / sustainable technologies for water/sanitation/electricity and for new buildings
- Utilise available and or public land to stimulate demand for development of important social facilities
- Improved linkages/ integration with surroundings will provide opportunity to utilise neighbouring social facilities
- Capitalise on shared facilities/ resources in new development
- Influence of emerging planning policy, development control and public investment based on community participation
- Use momentum of catalytic development in the surrounding area to revive interest in the area by all stakeholders
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**THREATS**

- Increasing overall congestion could reduce accessibility
- Inadequate bridge flood capacities – loss of access and movement infrastructure
- High speeds on improved roads – hazardous to NMT safety and attractiveness
- Aspirant culture that prioritizes the vehicle and not the pedestrian or public transport.
- Increased high-order mobility routes with limited access
- Fragmented and uncoordinated River catchment management
- Increasing vehicles – air pollution
- Inadequate management of sanitation and storm water infrastructure and systems
- Reduced urban management resulting in Littering and illegal dumping
- Densification of land increases impact on quality of environment
- Increase in sealed surfaces = increased runoff impacts – littering/debris/water quality/siltation and erosion of unprotected surfaces
- Climate change impacts likely to increase environmental risk and decrease resilience of local communities
- Continued informal settlement invasion of public open spaces (especially wetland and buffer)
- No vision and supporting development guidelines
- Inadequate development control and management relating to urban spaces and built form
- Inadequate resources to maintain and develop open space resources
- Poor or lack of design of public space
- Unresponsive building form - (not contributing to sense of place/landmarks/security through overlooking)
- Lack of development investment momentum to stimulate key changes
- Unplanned, unbalanced and fragmented and uncoordinated development
- Lack of clear and inclusive development vision
6 KwaMashu Development Concept

6.1 Role of KwaMashu Study Area

The proximity of the study area to a number of key regional and metropolitan transport routes and public transport infrastructure makes it one of the most accessible locations in the metropolitan region.

This includes the new metropolitan railway commuter spine that links the southern Umlazi Node and the northern Bridge City Node via the CBD of Durban, and the link to the northern regional commuter line to Richards Bay. As well as its location adjacent to two planned BRT routes and associated stations and stops along the Dumisane Makhaya Road (MR577), the Curnick Ndlovu Highway (MR 93) and Queen Nandi Drive.

This accessibility is enhanced by its location to the existing (soon to be redeveloped) taxi terminal at the intersection of Curnick Ndlovu Highway and Malandela Road. In addition it enjoys a very high degree of private vehicle accessibility which is provided by the abovementioned metropolitan arterial roads which surround it.

The Table 6.1 indicates the multi-layered roles that the study area plays as a neighbourhood within the eThekweni Metro, the Greater Inanda, KwaMashu, Ntuzuma area and within KwaMashu itself.

Table 6.1 speaks to the current and future roles that the area plays across three key dimensions: economic, social and environment.

Figure 6-1: Regional Accessibility
Table 6.1: Role of Study Area

<table>
<thead>
<tr>
<th>Role</th>
<th>Metro</th>
<th>Sub Metro</th>
<th>Local</th>
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<tr>
<td>Economic</td>
<td>Secondary Intermodal transportation node forming part of the Northern Urban Hub and linking communities in the INK and Phoenix areas to the metro area and beyond</td>
<td>Secondary level Intermodal node linking communities in the INK and Phoenix areas to the northern metropolitan opportunity and employment zones</td>
<td>Local level commercial support node (retail, office, social) associated with local and metropolitan integrated public transportation providing for a range of small business entrepreneurs as well as a mobile workforce</td>
</tr>
<tr>
<td>Social</td>
<td>Accessible High density mixed income residential precinct supporting TOD along metropolitan transportation routes</td>
<td>Highly accessible high density mixed income and mixed housing precinct supporting established industry and emerging commercial activity</td>
<td>Local level social facility node and precinct including sport and recreation facilities</td>
</tr>
<tr>
<td>Environmental</td>
<td>Minor tributary of the Piesangs River</td>
<td>Minor stream system providing protection to MOSS assets in the Piesangs Valley in terms of storm water management, wetland protection, siltation prevention, water pollution control</td>
<td>Local open space system providing integrated multi-functional public open space and green lung as support for, and buffer to, high density urban development</td>
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</table>

6.2 Development Principles

The following are spatial development principles that emanated from the sectoral investigations and the integrated assessment process.

6.2.1 Access
- Ensure greater integration with adjacent neighbourhoods through additional and or enhanced vehicular, but particularly pedestrian access points and linkages
- Provide for optimum linkage and integration between emerging public transportation facilities and systems
- Ensure that the type, mix and distribution of land uses and activities capitalises on the accessibility and centrality of the Study Area within INK and Phoenix Area through the application of TOD concepts

6.2.2 Vitality
- Provide for adequate open space to “buffer” potential impacts related to high density and intense urban living
- Upgrade and or provide additional infrastructure to ensure provision of reliable services and to manage environmental impacts of intense urban activities

6.2.3 Sense
- Ensure that the history relating to the area is respected and celebrated where appropriate through integration of features and or events into the future structure and form of space and built form
- Utilise existing natural features and built form to provide landmarks, imageability, legibility and meaning for residents and to differentiate between the various neighbourhoods in the study area

6.2.4 Fit
- Ensure that pedestrians are afforded the highest priority with respect to existing and new connections, facilities and infrastructure
- Capitalise on the high density nature of the precinct, but ensure that it is supported by adequate social infrastructure and public space
- Significantly increase the extent, and improve the capacity of, public open space to cater for needs of all residents and users of the area

6.2.5 Control
- Establish clear definition between public and private spaces within urban fabric and particularly within residential areas
- Design public spaces and buildings so as to maximise surveillance of the public environment
### 6.3 Vision

The study area will be part of a **revitalised precinct supported by intermodal transportation facilities and mixed uses** that fulfill its role as part of the wider INK and Phoenix Urban Hub comprising of Bridge City, KwaMashu Town Centre and KwaMashu A. It will connect INK with the metropolitan commuter rail system through Duffs Road Station and the adjacent proposed BRT stations on Malandela Road, Dumisani Makhaya Road (MR577) and Curnick Ndlovu Highway (MR93).

It will become an area that:

- **Accommodates a wide range of lifestyles** including single and multiple occupant households in a range of housing types and forms i.e. singles, students, couples, families, elderly
- The area will be **urban and public**, but it will promote a sense of community and it will provide protection for and respect the privacy of households
- Is **well serviced** with regard to public open space and social facilities that provides access to recreation, health & education opportunities
- The **public spaces will be people friendly** and designed to allow people and communities to meet, engage and live together.
- The area will feature a **mix of residential neighbourhoods** including housing in quieter predominantly residential areas and housing in high intensity mixed use neighbourhoods that are closely associated with public transportation and commercial nodes.
- Streets will be **urban in character and multifunctional** and will provide for:
  - Pedestrian linkage through the area,
  - informal residential play spaces,
  - Parking
  - Cycling

- Some streets in mixed use nodes will be designed to also accommodate informal markets and trade
- Buildings will be **a mix of old and new** and will retain identity with the history of the area whilst celebrating change. Buildings should include new urban typologies that accommodate mixed uses to provide for community facilities and residential accommodation in a viable and sustainable manner.

### 6.4 Conceptual Framework

The study area, by virtue of the history of development of fragmented townships and isolated and “gated” hostels, as well as, the location of major metropolitan transportation infrastructure, is not a spatially cohesive area. However, the opportunity exists, as part of current public transportation interventions, economic revitalisation programmes and residential upgrade programmes, to restructure and reorganise movement and activity in the area in such a way so as to respond to the principles outlined above and begin to set in place “building blocks” that will enable the community to be more effectively integrated into the wider urban systems (Figure 6-2).
6.4.1 Sub Metropolitan
- Establish a new vehicular link off the Dumisane Makhaya Road to improve access to metropolitan system and reduce traffic along Malandela Road
- Accommodate the upgraded and expanded taxi terminal that forms part of the metropolitan public transportation system

6.4.2 Precinct
- Establish a centrally located multi-functional public open space system that has capacity to meet the needs of all residents in terms of passive recreation space and cater for children’s play areas, jogging, walking, cycling, picnics, social gatherings and meetings
- Establish a new pedestrian oriented and multifunctional spine (linear space) that links all the existing and future public transport facilities, commercial, social and recreational facilities within and adjacent to the area and that will operate as a primary public space that structures the precinct internally, as well as, integrates it with its immediately adjacent precincts and neighbourhoods
- Establish a new multimodal link between, and through, Duffs Road Station and Thembalihle Station and that integrates the study area with immediately adjacent neighbourhoods to the west and east of the study area

6.4.3 Neighbourhood
- Establish a series identifiable higher density neighbourhoods adjacent to the proposed new multi-functional spine
- Establish a series of medium density residential neighbourhoods
- Reinforce the local recreational nodes within each neighbourhood as landmark elements
- Establish a serviced network of pedestrian routes and links that integrates the area internally and connects it to adjacent precincts and neighbourhoods.
- Establish a hierarchical network of local roads that connects the area internally and to adjacent precincts and neighbourhoods.

Figure 6-3: Applied Conceptual Framework
6.4.4 Buildings and Spaces

- Introduce new mixed building typologies that accommodate opportunities for small businesses at ground level and residential or office space at upper levels.
- Introduce building typologies that are able to define public and private space so that streets and spaces are clearly demarcated and designed.
- Introduce a range of housing options that provide for individual, family, elderly and student accommodation.
- Utilise varying building heights and forms to create diverse landscape quality and character and to improve identity and imageability.

Figure 6-4: Mixed Building Typologies e.g., Brickfields (JHB)
7 Urban Design Strategy

7.1 Spatial Structuring and Place Making Strategy

The study area, but in particular KwaMashu A, is characterised by a lack of spatial organisation at the scale of the entire precinct, as well as, at neighbourhood and street level. As a consequence the definition between public space and private space is “fuzzy” and the “ownership” and “responsibility” for space is not clear. This leads to poor environmental quality, poor neighbourhood cohesiveness, a lack of identity and pride, poor safety and security and a significant impact on the dignity of individuals and communities.

The primary urban design interventions required to direct future development in the study area in accordance with the abovementioned vision and development concept is twofold. Firstly, establish a legible, flexible and functional spatial structure for the study area which can enable improved service provision and neighbourhood structure, and secondly, employ and apply a suite of “place making” principles in the redevelopment of both public space and built form which can assist in promoting community identity and sense of belonging.

In particular, there is a need to spatially restructure formal and informal settlement in the hostels area, and adjacent neighbourhoods, so that provision is made for the study area to connect into immediately adjacent neighbourhoods, as well as, into the wider area of KwaMashu, Phoenix and the City. This spatial structure should also provide defensible urban blocks and neighbourhoods which can be developed according to their inherent local characteristics and potential. This is achieved through the establishment of a more discernible

organisation of public space i.e. definition of roadways, streets and other public spaces (including hard urban spaces and soft green spaces) that can accommodate public services and infrastructure and which will define “blocks” of land that can accommodate a range of urban land uses and activities (i.e. urban blocks). This restructuring needs to be done in a manner that will promote the development of a human scaled settlement and a “permeable”, “fine grained” and responsive urban form.

Figure 7.1 below shows that block structure that has been developed.
The spatial structuring described above needs to be supported by a suite of place making objectives and principles that apply to the development of public spaces, urban blocks and built form and which create a system of urban elements which organise activity in space in the study area.

These will include the following elements:

- Integrated access and circulation network of streets, roads and pedestrian ways that provide for optimum accessibility and mobility across all modes of movement
- Appropriately mixed uses and activities in nodes and in individual buildings that serve community needs and provide diversity and activity
- Multi-functional streets and public spaces that are useable and safe and that accommodate the needs of the communities
- Establish gateways, landmarks and focal points in the study area and in neighbourhood precincts that structure space and provide imageability, legibility, orientation and meaning
- Provide landscaping that provides identity and character for neighbourhoods, streets and spaces
- Develop building types, shapes and sizes that define and shape streets and “enclose” public space and that make streets vibrant and safe and secure
- Provide multiple access to and from all precincts for all transport modes

The sections that follow below describe the primary structuring and place making elements that should be established in accordance with these objectives.

### 7.2 Streets

#### 7.2.1 Transit Oriented Development (TOD) Boulevards

These Boulevards will be primary connectors to the surrounding transportation network and systems and adjacent urban areas, but will also function as primary precinct level public space elements linking internal public transportation nodes and associated activity.

- **Jabula / Heron / Umbando Road** is proposed as a major new “TOD boulevard” that will link the proposed new Crossroads Precinct with Duff’s Road Station and the proposed new entrance off Umbando onto MR 577 and the new BRT Station situated along MR 577. It will be a critical new part of the local bus/taxi feeder system to the rail and BRT systems and will link the study area to surrounding areas. It is proposed as a new urban “feature” that will restructure the area adjacent to Duffs Road Station and that will perform as a new multi-functional urban space to structure movement, manage vehicles and pedestrians, provide parking and accommodate mixed commercial and community activity (Figure 7-2).

![Image: Jabula Road at Duffs Road Station](image-url)
Musa Road / Sikhindi Road / Amanzimtoti Road is to be upgraded as a new “TOD Boulevard” that will connect the Crossroads Sub-Precinct to the Thembalihle Station sub-precinct through to Queen Nandi Drive and beyond (refer to Figure 7-3). The upgrading will provide for greater connectivity, management of vehicles and pedestrians, parking and mixed activity and an additional public space feature.

7.2.2 Urban Avenues
These are local neighbourhood level public space elements and local access and circulation corridors for public transportation and which link neighbourhoods to various nodes in the precinct.

- Sikhindi Road will be an upgraded urban street to link KwaMashu B (including the schools precinct) with the BRT station along MR 577 and to Thembalihle Station
- Kholwa / 109611 Roads will be an upgraded central urban street to link the BRT station along MR 577 to Thembalihle Station whilst linking the proposed new central park and existing social and commercial cluster to public transportation (refer to Figure 7.4)

7.2.3 Local Roads and Streets
All existing local streets in the precinct will be retained and or upgraded with some new local access streets added to complete the local access network. These streets will also function as local level public spaces to provide places for people to meet and children to play. Proposed new streets are as follows:

- Link Jabula and Kholwa
- Additional new link between Jabula and Musa
- Extension of Swan to Hayfields (in Phoenix)

7.2.4 Lanes
As discussed in the Transportation Framework pedestrian infrastructure will be dedicated or integrated with boulevards, avenues, local streets and roads.

However, within the urban blocks that will be created pedestrian prioritised lanes should be established as multi-functional spaces that function as open space elements for adjacent communities.

The network of lanes is also designed to provide maximum permeability of the urban fabric for pedestrians.

The streets as described above are reflected on the following figures:

- Figure 7-5: Access and Circulation Framework
- Figure 7-6: Public Transport Framework
- Figure 7-7: NMT Framework
7.2.5

Figure 7-5: Access and Circulation Framework
Figure 7-6: Public Transport Framework
7.3 Activity Nodes

7.3.1 Primary Activity Nodes

- The Thembalihle and Duffs Road Station precincts are two important mixed use nodes that will, in general terms, accommodate retail and commercial activity, intermodal facilities for bus and taxi transfers from/to rail and also informal trading areas.
- **Thembalihle Station** is close to the small administrative buildings cluster that houses municipal services for residents and this should be integrated with the node. The vacant land on the north-eastern side of the station should form part of the node and should include residential development mixed with local commercial development.

- **Duffs Road Station** is an important regional hub station in that it links the INK complex and south western portions of Phoenix to both the central and northern areas of the metro. Accordingly, it will accommodate higher numbers of commuters and will need to accommodate intermodal facilities on both sides of the station. This node needs to be integrated with the proposed new Jabula Road / Heron / Umbando Road Activity Street and the Heron Road Sports facility to support a double sided development of the station and to link from Flamingo (Duffs Road) across Cornick Ndlouv with Hayfield Place in Phoenix is needed.
The BRT Station situated along MR 57 will be a new entrance to the study area and the precinct surrounding it should be treated as such in terms of public space and landscaping treatments. On both sides of the BRT Station public transport feeders systems should link to the BRT creating new activity nodes.

7.3.2 Local Neighbourhood Nodes
These nodes are important landmark and neighbourhood identity elements that need to be upgraded through public space upgrading. These nodes include:

- the cluster of social facilities located at the intersection of Ntolozo and Musa Roads (Figure 7-11)
- the mixed use cluster at corner of Pumula and 109611 roads (Figure 7-12)
- the commercial cluster at Sivumelwane and Kholwa Roads
- the schools cluster at Sikhindi and Giya Roads (Figure 7-13)
Figure 7-12: Pumula/Kholwa Road Entertainment Node

Figure 7-13: KwaMashu B Local Neighbourhood Node
7.3.3 Open Space Nodes
The following spaces need to be upgraded as follows:

- Central Sports Facility on Jabula Road – regional level multi-purpose facility with provision for football, netball/basketball with associated change room and field infrastructure including, seating, lights and some parking and fencing (Figure 7-14)
- Kholwa Road – precinct multi-purpose facility with provision for football, netball/basketball with associated change room and field infrastructure including, seating, lights and some parking and fencing (Figure 7-15)
- Umbando Road – precinct level multi-purpose facility with provision for football, netball/basketball with associated change room and field infrastructure including, seating, lights and some parking and fencing (Figure 7-13)
- Umholoba Road – precinct multi-purpose facility with provision for football, netball/basketball with associated change room and field infrastructure including, seating, lights and some parking and fencing (Figure 7-16)
7.4 Public Space and Landscaping

The density of development within the study area, and in particular within the KwaMashu A area is such that public open space and associated landscape infrastructure needs to be conceptualised and designed in a manner that has the capacity to provide maximum support to, and relief from, high density urban living.

7.4.1 Principles

- Protect and respect the existing open spaces and increase the quantity and useability of public open space
- Provide a clearly defined continuum of open spaces ranging from general public space through to private open space (e.g. public parks to private to communal residential courtyards)
- Design roads and streets as part of the multifunctional public space system
- All local roads and streets, squares, parks, river or stream systems, public transport terminals, ranks and stops should be integrated into an interconnected public space system

The Landscaping Strategy is based on the following thrusts:

- The study area consists of sub-precincts and neighbourhoods and there should not be an attempt to coordinate all the landscaping within each of these areas. Landscaping should rather focus on key integrating elements which run through or connect different sub precincts and neighbourhoods e.g. boulevards, avenues, key gateways, major pedestrian spines, whilst establishing local landscape character on a sub-precinct or neighbourhood level based on local inherent characteristics, features and history.
- The density of settlement in the study area is such that public spaces will be very intensely used and landscaping treatments should therefore be designed to withstand significant use, but also to provide relief from compact urban living.
- The public environment (i.e. spaces and buildings) should incorporate local history and culture so as to increase sense of place and local identity of the precinct as a whole and of each sub-precinct where appropriate.

7.4.2 Central Park

A proposed new Central Open Space Spine will be located alongside the stream (from Umholoba Road in Kwa Mashu B to Musa Road) that dissects the study area and which will provide a green precinct level public space feature and lung for the surrounding high density environment. A central portion of the spine located between Thula, Jabula and Kholwa Roads will form a central urban park and could accommodate facilities for recreation and community events (Figure 7-18).

The park will integrate all precincts and neighbourhoods and will provide for a range of activities such as picnics, children’s play areas, public and community meetings, social gatherings, walking, jogging and cycling.

The park will also form a storm water management function and will also provide opportunity for school children to access, and learn about, the natural environment.

Figure 7-18: Central Park
7.4.3 Public Spaces

Public Places
There will be a number of public spaces created as development proceeds and not all of them can be identified at this stage. However, there will be important public spaces associated with public places that serve the community of the area. These include:

- the rail station entrances and BRT rank and stop facilities
- within public building clusters
- adjacent to commercial nodes

Additional public spaces must be designed into housing and commercial layouts at the detailed design stage of projects by the responsible implementing agent.

Urban Block Courtyards
The urban blocks that have been defined will accommodate land uses in different mixes depending on where they are situated in the precinct.

Many of them will be predominantly residential either in a “new build” or “reblocking” form. In either case provision should be made for the establishment of a central “semi-private” courtyard which could be used by the surrounding residents for play space, meetings, relaxation or parking.

7.4.4 Gateways, Landmarks and Focal Points

Gateways
The study area is surrounded by major transportation infrastructure installations (road and rail) which effectively isolate the area from its immediate surroundings so it is important to provide clear entrances and exits to the area. The following areas play important gateway roles and should be enhanced through public space upgrading and associated signage and landscaping treatment. Buildings in these locations should also have landmark qualities and their design should assist in identifying the gateway.

- Duffs Road and Thembalihle Rail Station Precincts
- BRT Station Precinct along MR 577
- Entrance off Malandela Road opposite Crossroads development
- Proposed new interchange area off MR 577
- Improved access point off Queen Nandi at Amanzimtoti Road
- Famingo (Duffs Road) link with Hayfield Place

Landmarks
The following local landmarks should be protected and or enhanced through the establishment of an “historic/heritage quarter” and enhanced through building upgrades and / or appropriate public space landscaping.

- Kings Palace
- Social Welfare Node
- Local Cemetery

Other local landmarks include:

- Schools in KwaMashu B and Duff’s Road neighbourhood
Figure 7-19: Public Landscaping
7.5 Built Form Guidelines

Building stock in the study area is a mix of “suburban”, urban and informal typologies and density varies significantly across the sub-precincts. These existing typologies do not promote clear spatial structure or clear definition between public and private space which leads in turn to a lack of precinct and neighbourhood legibility and identity, unclear “responsibility” for space, as well as, loss in privacy for individual households.

It is proposed that the type of building development that is likely to take place through upgrading processes could be a mix of “new build” and in situ settlement upgrade (“reblocking”) or informal settlement upgrade. Whichever way the typology mix and configuration unfolds the following guidelines relating to built form should be promoted.

7.5.1 Built Form Guidelines

Perimeter Block Development
The principle of developing on the outside perimeter and edge of urban blocks and or subdivisions so that public outward facing building edges define public spaces and streets and the internal courtyards generated become semi private spaces for residents and communities to use for less public activities such as parking, recreation and services, thus creating a continuum of public to private space.

Building Scale and Massing
Ensure that the shape and size of a building or building cluster is relative to its immediate context of public space and or other buildings and always to the human scale. Building mass is critical to spatial quality and creating the sense of either openness or enclosure that helps define streets and spaces.

Building Height
Building height is important for place making and legibility in the urban environment. There is not much height variation in the built form across KwaMashu, resulting in a bland monotonous low rise form that lacks distinctiveness with very little definition at the neighbourhood or district level. Height variation with accent at key locations enables navigation and helps create district and neighbourhood identity.

Mixed Use Buildings
An appropriate mix of use within an urban block and/or buildings should be encouraged to ensure high levels of neighbourhood and street activity, urban diversity and vibrancy and overall safety and security. Mixed use spreads activity over time and increases thresholds for commercial activity, services and general safety and security in the public environment.

Landmarks and Accent
Landmarks provide an orientation cue, and form memorable locations. They provide anchors to key paths/ routes and help emphasise public spaces. Landmarks should be unique and memorable and are important at a range of scales, from precinct through to local neighbourhood levels.

7.5.2 New Build
The “new build” approach works on the assumption that all existing residents wish to access a formal housing opportunity either through ownership or through rental. Under such a scheme sufficient land in the study area will have to be cleared of existing informal structures to develop new high density medium rise building clusters, much the same as has been already undertaken in the area. Should this option be pursued then the guidelines above will be particularly relevant. Figure 7-20 and Figure 7-21 indicate diagrammatically how a mix of units could be configured to respond to the guidelines.

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7.5.3 In-Situ Settlement Upgrade ("Reblocking")

Although in-situ settlement upgrading is not a new concept its application in contexts of high density informal settlement has proved problematic. This is particularly due to the employment of fairly high standards for roads and public facilities which necessitates significant relocation of sections of a community. A more recent concept, i.e. “reblocking”, employs in-situ upgrading concepts but seeks to restructure existing dwellings and structures in-situ without relocation of communities whilst at the same time providing public “rights of way” within settlements that can accommodate basic services such as water, sanitation, pedestrian access and electricity. An extract from documentation relating to the “reblocking” concept is provided below.

‘Re-blocking is a process developed by Shack Dwellers International (SDI) that is based primarily on the spatial reconfiguration of shacks in informal settlements (SDI 2012). Shacks are rearranged and reconstructed to maximize open space in the settlement. Shacks are also often built on raised platforms and the settlements graded to prevent flooding. Re-blocking is considered an in-situ process due to its minimal disruption of resident’s lives throughout the duration of the project. Re-blocking is only made possible by the commitment and manual labour of community members where re-blocking is occurring, a very bottom up strategy’.

Whilst this option provides limited opportunity to respond to all the built form guidelines the mixed use, perimeter block, and landmarks and accent guidelines could be applied effectively.

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Figure 7.22: Re-blocking Concept: Flamingo Crescent, Cape Town

Images from: http://www.sdinet.org/blog/categories/cape-town/
Figure 7-23: Indicative Re-blocking
7.5.4 Indicative Built Form Response

The drawing below indicates diagrammatically how the proposed primary structuring elements (boulevards, avenues, local streets and activity nodes) described above could manifest over time.
8 Transportation Framework

Currently there is a very fragmented, and in some cases undefined, network of roads, streets and pathways that can accommodate a system of transportation commensurate with the intensity and density of development in the study area. The intensity of the study area requires is a system of multi-modal access and movement networks that has the capacity to accommodate incrementally increased and improved transportation infrastructure that will be required to accommodate emerging new and/or upgraded public transport systems and Non-Motorised movement (i.e. pedestrians and cycles).

8.1 Principles

The principles for the transportation framework favour the creation of public transport orientated and pedestrian oriented environments:

- Plan and design the study area around pedestrian and bicycle prioritisation, comfort, convenience, security and safety
- Increase options and choices of routes for people (and vehicles) to access public transportation facilities
- Provide for optimum integration of the study area with surrounding areas and with BRT and rail based public transportation facilities and systems
- Provide for a hierarchical movement system that provides for both “mobility” and “access” in a safe and efficient manner

8.2 NMT

The NMT routes proposed include both dedicated pedestrian routes and integrated routes and are designed to accommodate both longer walking distances as well as trips to local destination and / or public transport.

- Integrated and dedicated facilities along all bus / taxi feeder systems
- Integrated facilities along local roads and streets
- Dedicated routes through urban blocks
- Integrated and dedicated facilities along the new link to Phoenix over the Curnick Ndlovu Arterial
- Integrated and dedicated facilities over MR 577 to connect the study area with BRT along MR 577
- Upgraded pedestrian routes associated with existing bridges that cross Malandela Road and the MR577
- Upgraded and improved integrated and dedicated facilities around all local nodes

Bicycle facilities will include:

- Dedicated cycle ways are proposed along the new “urban streets”, i.e. Musa, Jabula/Heron/Umbando, Sikhini, Kholwa
- Integrated systems will be accommodated on other local streets and roads
- Bicycle parking facilities at the major PT-nodes (Thembalihle, Duffs Road Stations and the BRT stops)

Figure 7-7 shows the NMT Framework for the study area.

8.3 Public Transportation

The internal public transportation proposals are designed around the latest information relating to the upgrading of the two Rail Stations and the construction of the C1 and C3 (short term) BRT corridors which will run adjacent to the study area.

- Public transport Feeder Routes along Jabula/Heron Road extension into Umbando, Kholwa; Musa Road extended into Sikhini Road; and Flamingo Road to Hayfield Place
- Public transport facilities on both sides of Thembalihle and Duffs Road Stations and at new interchange and BRT Station along MR 577

Figure 7-6 shows the Public Transport Framework for the study area.

8.4 Access and Circulation Network

The following are proposed interventions that are required to support the development concept and urban design strategy:

- The local access roads and streets will complete the road network and will provide access to precinct blocks and individual subdivisions or developments.
- Create an internal collector and distributor road system that links into the surrounding major and minor arterial systems of Curnick Ndlovu, Dumisani Makhaya, Malandela Road and Queen Nandi Drive and with the two railway stations, and that also provides a bus/taxi feeder road system that will support the rail and BRT public transport systems. This system is to be comprised of Jabula Road extension into Umbando, Kholwa and Musa Road extended into Sikhini Road. Vehicular access points are to be enhanced are at the intersection of Musa Road with Malandela Road and Sikhini Road with Queen Nandi Drive. New access points are to be created off Umbando with Dumisani Makhaya (MR 577) and Flamingo (Duffs Road) across Cornick Ndlovu with Hayfield Place in Phoenix.
Vehicular access points are to be enhanced at the intersection of Musa Road with Malandela Road and Sikhindi Road with Queen Nandi Drive. New access points are to be created off Umbando with Dumisani Makhaya (MR 577) and Flamingo (Duffs Road) across Cornick Ndlovu with Hayfield Place in Phoenix.

The new access off MR 577 should comprise of a new interchange that will accommodate vehicular traffic and pedestrian routes linking into the new BRT station situated on MR 577 at its intersection with Avoca Hills Drive.

Figure 7-5 in section 7.2 (page 29) shows the Access and Circulation Framework for the study area.
9  Land Use Management Framework

9.1  Sub-Precincts

The study area is 258ha and is comprised of four distinct sub-precincts (character areas). These sub-precincts provide the basis for understanding the structure and character of the study area, allocating land uses and provide an indication of the type of land use management system that would be most appropriate.

<table>
<thead>
<tr>
<th>Sub-Precinct</th>
<th>Existing Character</th>
<th>Proposed Character</th>
</tr>
</thead>
</table>
| **KwaMashu Unit B**  
(Emgidweni)  
65ha | • Formal suburban residential neighbourhood with community facilities at the core.  
• Formal private ownership of land  
• Sub-divisional pattern intact | • Retain formal suburban residential neighbourhood character.  
• Permit medium density residential development on consolidated sites provided the overall amenity of the area is maintained.  
• Limit non-residential uses  
• Development to be driven by the private sector |
| **KwaMashu Unit A**  
145ha | • Former hostel area and interspersed with dense informal settlement.  
• Informal trading activity throughout neighbourhood and along major pedestrian routes  
• Few social facilities  
• No sub-divisional pattern  
• Informal private ownership of houses, public ownership of land | • Upgrade and / or redevelop through ‘reblocking’ or new build development of medium to high density residential developments  
• Promote and encourage mixed-use development at and within the vicinity of major public transport facilities i.e. Duffs Road and Thembalihle Rail Stations  
• Investigate the provision of a primary school site within the neighbourhood  
• Provide for informal trading spaces along major public transport and pedestrian routes and in and around public spaces.  
• Establish a sub-divisional layout for roads, public spaces and civic and social uses with the intent to extend this to residential sub-division over time  
• Development to be driven by the public sector |
| **KwaMashu Unit E**  
(Crossroads)  
15ha | • Municipal/administrative service centre cluster with some neighbourhood level commercial activity | • New retail and public transport interchange zone  
• Enhance the administrative and municipal service centre role  
• Development to be driven by the public sector with private sector investment  
• Encourage the redevelopment of the formal hostels on Malandela Road to higher density residential |
| **Duffs Road**  
33ha | • Formal suburban residential neighbourhood in isolated cul-de-sac.  
• Formal private ownership of land  
• Sub-divisional pattern intact | • Retain formal suburban residential neighbourhood character.  
• Permit medium density residential development on consolidated sites provided the overall amenity of the area is maintained.  
• Limit non-residential uses  
• Development to be driven by the private sector |

---

4 The provision of a primary school site will need to be traded off against residential yields.

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Figure 9-1: Sub-Precincts

- UNIT A: 145ha
- UNIT B: 65ha
- CROSSROADS: 15ha
- DUFFS ROAD: 33ha

Royal HaskoningDHV (14 August 2015)
9.2 Land Use Activities/Zoning

Land use and Zoning proposals for the area are as per Table 9.1.

Table 9.1: Proposed Land Use Definitions

<table>
<thead>
<tr>
<th>Land Use / Zoning</th>
<th>Objective/Intent</th>
<th>Crossroads</th>
<th>Duffs Road</th>
<th>KwaMashu A</th>
<th>KwaMashu B</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential 1</td>
<td>• Protection of amenity of existing suburban residential areas</td>
<td></td>
<td>22</td>
<td>7</td>
<td>49</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>• Permit redevelopment to accommodate suburban housing forms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Permit low-impact ancillary and small-scale economic land use activities, i.e. home business</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential 2</td>
<td>• Areas where redevelopment, accommodation of existing ‘hostels’ and/or ‘re-blocking’ of existing informal settlement is accommodated</td>
<td>2</td>
<td>63</td>
<td></td>
<td>66</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Redevelopment of informal settlement to medium to high density residential</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Permit small-scale economic land-use activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Provide for informal trading</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential 3</td>
<td>• Provision for high density residential accommodation supported by a range of ancillary uses which serve the day to day needs to the residential community</td>
<td></td>
<td>3</td>
<td>12</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>• Local commercial (formal and informal), community facilities and recreation uses to be accommodated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixed Use</td>
<td>• Provide for a range of formal and informal business opportunities</td>
<td>12</td>
<td>8</td>
<td>2</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Allow for the development of a range of complimentary land uses of commercial, office, service, administrative, informal trade and residential in nature</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Locate mixed use activities around major public transport facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>• Provide a range of education facilities</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Civic and Social</td>
<td>• Provide for a range of intuition, social facilities, government services and offices</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Public Open Space</td>
<td>• Provision of public open space, sports fields and public parks</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental</td>
<td>• Protection of key wetland and riverine systems that provide for ecosystem goods and services</td>
<td>3</td>
<td>6</td>
<td>3</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Provide for the creation of parks, gardens and landscaped areas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rail</td>
<td>• Rail reserve with ancillary uses including commercial development at the stations</td>
<td>21</td>
<td>2</td>
<td></td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Road</td>
<td>• Roads shall only be used for vehicular and pedestrian traffic movement and incidental uses</td>
<td>1</td>
<td>3</td>
<td>21</td>
<td>6</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>• Proposed roads indicate approximate positions or reservations of land for proposed future roads and road widening</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15  33  145  65  258
Figure 9-2: Land Use/Zoning Framework
9.3 Land Use Budget

In order to determine what population, land use activities and residential density could (or need to) be supported in the study area, an initial exercise to determine what land is available for development and/or redevelopment has been undertaken.

As noted in section 9.1, the total study is 258ha. Of this total area, 67ha is allocated to the existing rail reserve and stations (23ha), existing and proposed roads (31ha) and 13ha to environmental assets – essential floodplains (12ha). This leaves 192ha of land area available for the allocation of other land uses.

Of the 192ha of available land, a further 115ha is allocated to ‘firm’ land uses and are unlikely to be redeveloped as part of this restructuring exercise. These include Residential 1 areas (78ha), Residential 3 areas (excluding blocks AH17 and DH04) (8ha), Mixed Use areas (excluding blocks AH10, AH12 and AH18) (18ha), Education areas (2ha), Civic and Social areas (4ha) and Public Open Space areas (77ha). Essentially this project can influence the remaining 76ha of land for new housing, redevelopment or new mixed use developments.

71ha is in the KwaMashu A precinct, 3ha in Duffs Road and 2ha in Crossroads.

Table 9.6 provides the full detail of each block area and highlights (red text) those blocks that are potentially developable.

<table>
<thead>
<tr>
<th>Study Area (258ha) less</th>
<th>Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail</td>
<td>23</td>
</tr>
<tr>
<td>Road</td>
<td>31</td>
</tr>
<tr>
<td>Environmental</td>
<td>13</td>
</tr>
<tr>
<td>Total Area Non-developable</td>
<td>67ha</td>
</tr>
<tr>
<td>Available Land Area</td>
<td>192</td>
</tr>
</tbody>
</table>

Table 9.3: Firm Land Use Areas Not Available for Development/Redevelopment

<table>
<thead>
<tr>
<th>Available Land (192ha) less</th>
<th>Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential 1</td>
<td>78</td>
</tr>
<tr>
<td>Residential 3 (excl AH17/DH04)</td>
<td>8</td>
</tr>
<tr>
<td>Mixed Use (excl AH10/AH12/AH18)</td>
<td>18</td>
</tr>
<tr>
<td>Education</td>
<td>2</td>
</tr>
<tr>
<td>Civic and Social</td>
<td>4</td>
</tr>
<tr>
<td>Public Open Space</td>
<td>5</td>
</tr>
<tr>
<td>Available Developable</td>
<td>77</td>
</tr>
</tbody>
</table>

Table 9.4: Land Area Available for Potential Development/Redevelopment

<table>
<thead>
<tr>
<th>Developable Land (77ha) less</th>
<th>CrossRoads</th>
<th>Duffs Road</th>
<th>Unit A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential 2</td>
<td>2</td>
<td>3</td>
<td>63</td>
</tr>
<tr>
<td>Residential 3 (AH17/DH04)</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Mixed Use (AH10/AH12/AH18)</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civic and Social</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Open Space</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Available Developable</td>
<td>2</td>
<td>3</td>
<td>71</td>
</tr>
</tbody>
</table>
### Table 9.5: Total Land Use Budget

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Crossroads</th>
<th>Duffs Road</th>
<th>KwaMashu A</th>
<th>KwaMashu B</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civic and Social</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixed Use</td>
<td>12</td>
<td>8</td>
<td>2</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Public Open Space</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential 1</td>
<td>22</td>
<td>7</td>
<td>49</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>Residential 2</td>
<td>2</td>
<td>63</td>
<td></td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>Residential 3</td>
<td>3</td>
<td>12</td>
<td></td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Environmental</td>
<td>3</td>
<td>6</td>
<td>3</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Rail</td>
<td>21</td>
<td>2</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road</td>
<td>1</td>
<td>3</td>
<td>21</td>
<td>6</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td><strong>15</strong></td>
<td><strong>33</strong></td>
<td><strong>145</strong></td>
<td><strong>65</strong></td>
<td><strong>258</strong></td>
</tr>
</tbody>
</table>

### Figure 9.4: Land Use and Block Plan

### Figure 9.5: Land Use Budget Chart

- Residential 1: 30%
- Residential 2: 25%
- Residential 3: 6%
- Environmental: 5%
- Rail: 9%
- Road: 12%
- Mixed Use: 8%
- Education: 1%
- Civic and Social: 2%
- Public Open Space: 2%

Royal HaskoningDHV (14 August 2015)
Table 9.6: Land Use Yield per Block

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<tr>
<th>Blocks</th>
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<th>Education</th>
<th>Environmental</th>
<th>Mixed Use</th>
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<td>65.9</td>
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9.4 Target Population

As noted in Section 4.1, the population for the study area is estimated to be between 46,590 to 54,241 people.

According to StatsSA (2011) the population estimate is 46,590 for the study area, with the KwaMashu A area estimated at 37,470. The DUT land-use and socio-economic study however estimated this population at 45,121. A 20% higher estimate than the Census data.

<table>
<thead>
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<th>Table 9.7: Population Estimates</th>
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<td>KwaMashu B</td>
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<tr>
<td>KwaMashu A</td>
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<tr>
<td>Study Area</td>
</tr>
</tbody>
</table>

The assumption for this project is that the existing population of KwaMashu B, Duffs Road and Crossroads is in formal housing and does not need to be accommodated in new or redeveloped housing.

This is not true for the population of KwaMashu A who will need to be accommodated on the 71ha of potentially developable land as described in Section 7.3 and Table 9.4.

This means that the **target densities need to be between 100 and 200 du/ha** (Table 9.8).

<table>
<thead>
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<th>Table 9.8: Density Requirements to Accommodate Existing Population</th>
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<td>190 du/ha</td>
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<td>200 du/ha</td>
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The table above provides an indication of the manner in which the current population could be accommodated in the study area. The mix of housing that will be required will need to be determined through a more detailed and rigorous process outside of this project scope.

Given housing affordability in the area (Section 4.4) these densities would need to be accommodated within a 50/50 split of RDP and CRU housing models.
10 Engineering Services

10.1 Approach to Water & Sanitation Upgrading

From the information available, the status quo of the water and sanitation within the study area is in a state of disrepair. The primary concern is the high water losses through the dilapidated water networks and infiltration permeability of sewer networks. The hostel area (central to the study area) is an area of particular concern, with the eastern and western bounds appearing to be noticeably improved. The poor condition of these services is attributable to the difficulty in locating pipe networks, due to encroachment of informal settlements over historical servitudes. Thus maintenance teams are not able to carry out meaningful repair work.

If consideration is given to the urban reblocking model, a possible methodology for refurbishment of water and sewerage network infrastructure is outlined below:

1. Using historical plans, GIS information and record drawings, identify pipelines (with special attention to bulk mains).
2. Locate and identify these pipe networks from the available information in the field where possible. Locate fire hydrants and/or valves (for water networks) and manholes (for sewer networks).
3. Conduct trial pit inspections at say 200m intervals between identified hydrants and manholes in an attempt to survey the condition of the pipes and verify the sizes (diameter) as well as the material. Note the Asbestos cement pipes need to be replaced.
4. Assess the condition of these pipes. If they are in a deteriorated state, then earmark them for replacement.
5. Once the condition assessment has been concluded, a hydraulic model needs to be developed for the water reticulation network and the sewer reticulation network, in line with the demands of the new urban reblocking model, taking into account land-use zones, densities and fire flow demands.
6. The capacity of the supply reservoir needs to be checked, although it is estimated the capacity should is sufficient.
7. Model the network, routing bulk pipelines along the major road networks (as identified in the urban reblocking model), identify which of the existing pipelines are available for reuse and which need to be abandoned based on hydraulic requirements and condition, etc.
8. It is estimated that 6km of both major water and sanitation infrastructure needs to be replaced (mostly within the central KM A area) and tied into existing networks. The minor reticulation networks will be replaced once the details of individual blocks have been developed.
9. The high level cost estimate for replacement of these networks is tabulated below:

<table>
<thead>
<tr>
<th>Service</th>
<th>Description</th>
<th>Total Length</th>
<th>Rate (Rands/km)</th>
<th>Cost (Rands)</th>
</tr>
</thead>
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<td>Potable Water</td>
<td>Inclusive of pipelines, fittings, hydrants, valves, yard connections, road crossings, excavations and ties ins</td>
<td>6 km</td>
<td>R 1 150 000.00</td>
<td>R 6 900 000.00</td>
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<tr>
<td>Sanitation</td>
<td>Inclusive of pipelines, manholes, yard connections, road crossings, excavations, reinstates and tie-ins</td>
<td>6 km</td>
<td>R 1 250 000.00</td>
<td>R 7 500 000.00</td>
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<td>Total</td>
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<td>R 14 400 000.00 (Excl VAT)</td>
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11 Implementation Recommendations

The Implementation Recommendations have been informed by the primary objective of the project which is “to identify physical infrastructure investment projects that will be game changing for the residents of the study area”. Whilst physical interventions have been identified using information to hand their implementation will need to be considered within the socio-economic and political dynamic of the study area, as well as, the wider development priorities and programmes of the Greater INK complex.

11.1 Implementation Principles

Key principles for the conceptualisation and prioritisation of capital investment projects include:

11.1.1 Provide for Basic Needs

Whilst Emgidwini (KwaMashu B), Duff’s Road, Emakhosini (Crossroads) and a small portion of KwaMashu A (northern portion) do have normal water, sanitation, roads and pedestrian sidewalks, storm water, electricity and street light services, the central part of the study area (i.e. KwaMashu A) is severely under serviced with respect to these services. Individuals and families in KwaMashu A are struggling to survive and the conditions do not provide a “platform” for individual endeavour and upliftment or for community stability.

11.1.2 Enable and Support Community Development and Upliftment

Similarly, as with basic services, KwaMashu A is severely disadvantaged with respect to the provision of Community Facilities that support community life and upliftment. Local facilities that do exist are in a poor state of repair and basic local facilities such as a primary school are non-existent. Whilst some facilities were provided at the time of construction of the original hostels these require significant upgrading and up sizing to accommodate significantly larger population numbers as well as a significantly different demographic profile.

Community facilities to include:
- A community centre (upgrade)
- Primary school (new)
- Recreation facility (upgrade)
- Environmental (upgrade)
- Housing (new and upgrade); and
- Business support (new)

11.1.3 Build on Current Development Initiatives that are Connecting the KwaMashu Community to the Urban System

There are a number of initiatives in the Metro area or the Greater INK area specifically which impact on the study area and any new interventions in the study area need to be integrated with these to add value to current investment. Examples of this are the BRT programme roll out, current CRU housing initiatives, the proposed Emakhosini (Crossroads) development, etc.

11.1.4 Promote Integrated Projects

Whilst capital investment invariably occurs around sector foci (i.e. housing delivery, water services, etc.) every effort should be made to deliver projects that integrate budgets across sectors and stakeholders and that “complete” pieces of urban upgrade. For example, a specific project could provide essential external road and PT connections, internal NMT circulation, settlement reorganisation and rationalisation, environmental upgrade, services upgrade, public safety and security (street lighting) and so on.

11.2 How to Start

11.2.1 Community Consultation and Participation

Whilst the focus of the study is on the identification of capital investment projects, the few meetings that were held with community leadership, clearly revealed that consultation and participation by the leadership and the community would be an essential ingredient for successful implementation of any development initiatives in the area.

To this end it is recommended that the consultation and participation initiative currently being carried out between the municipality, provincial government and the community leadership be used as a basis for its expansion into a more extensively resourced community consultation and participation process that will inform and add value to planning and development processes and decisions, implementation priorities and phasing, and identification of short and long term benefits to the community.

Key areas of focus for this initiative could be as follows:
- Alignment of local leadership around a development programme
- Identification of the process of decision making
- Identification of the needs of communities
- Identification of the short term benefits to communities of the development process
11.2.2 Institutional Alignment

In order to support the more extensive consultation and participation process described above, and in order to be able to respond more effectively to the needs of the communities of the study area, more focussed and sustained institutional alignment within the relevant Municipality departments, as well as, between the Municipality, other spheres of government and parastatals will be an imperative.

Key areas of focus for this alignment would be:

- Alignment of planning objectives with that of the Community
- Alignment of institutional objectives in line with the above focus
- Alignment of priorities for investment
- Alignment of budgets in relation to the above
- Urban Management – identification of areas of responsibility for the management of public spaces (i.e. station precincts, streets, parks, public buildings, etc.) and cooperation with respect to the operation and maintenance of infrastructure and services (i.e. water, sanitation, waste removal, etc.)

11.3 Capital Investment Programme

Capital investment should be prioritised in accordance with the principles outlined above so that maximum impact is made on the poor conditions prevalent in the area and also to initiate increased levels of alignments between service providers.

The table below provides order of magnitude costs for the implementation of the broad level proposals outlined within the scope of this project and indicates broadly what the phasing of development should be.
### Table 11.1: Implementation Plan

<table>
<thead>
<tr>
<th>PROJECTS</th>
<th>Project Description</th>
<th>SHORT</th>
<th>MEDIUM</th>
<th>LONG</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCESS / CIRCULATION</td>
<td>New street to connect Crossroads Entrance to Umbando Road and to provide feeder route access to Duff's Road Station Precinct</td>
<td>R 30 000 000</td>
<td>R 45 000 000</td>
<td>R 45 000 000</td>
<td>R 120 000 000</td>
</tr>
<tr>
<td>Jabula Road Boulevard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Musa Road Boulevard</td>
<td>New street to connect Crossroads Entrance to Umbando Road and to provide feeder route access to Thembalihle Station Precinct</td>
<td>R 40 000 000</td>
<td>R 20 000 000</td>
<td>R 21 500 000</td>
<td>R 81 500 000</td>
</tr>
<tr>
<td>Kholwa Road Avenue</td>
<td>New street to connect Duff's Road Station Precinct to Thembalihle Station Precinct</td>
<td></td>
<td>R 15 000 000</td>
<td>R 15 000 000</td>
<td>R 30 000 000</td>
</tr>
<tr>
<td>Durban Makhaya Interchange (MR 577)</td>
<td>New interchange to provide additional road access of MR 577 to KwaMashu A and to accommodate new BRT Station on MR 577</td>
<td></td>
<td></td>
<td>R 100 000 000</td>
<td>R 100 000 000</td>
</tr>
<tr>
<td>Pedestrian Bridge Precinct (across railway at Pumula Road)</td>
<td>Improve public space of access precinct to bridge on both sides for safety and security - paving, landscaping, lighting</td>
<td></td>
<td></td>
<td>R 2 500 000</td>
<td>R 2 500 000</td>
</tr>
<tr>
<td>Pedestrian Bridge Precinct (across rail at Ntolozo Road)</td>
<td>Improve public space of access precinct to bridge on both sides for safety and security - paving, landscaping, lighting</td>
<td></td>
<td></td>
<td>R 3 000 000</td>
<td>R 3 000 000</td>
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<tr>
<td>Swan Street Extension to Hayfield Road</td>
<td>Extension of road to provide firstly, access to proposed new housing site in Duff's Road neighbourhood and secondly, to provide access between Phoenix and the Duff's Road Station</td>
<td></td>
<td>R 21 100 000</td>
<td></td>
<td>R 21 100 000</td>
</tr>
<tr>
<td>New Integrated Bridge (across Curnick Ndlovu) to join Swan and Hayfields Road</td>
<td>Establish new integrated bridge across Curnick Ndlovu to improve access between Duff's Road Station and Phoenix for pedestrians and vehicles</td>
<td></td>
<td>R 25 000 000</td>
<td></td>
<td>R 25 000 000</td>
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<tr>
<td>Local Streets</td>
<td>Upgrade of local street to provide vehicular access, pedestrian sidewalks, services, street lighting and parking</td>
<td>R 30 000 000</td>
<td>R 30 000 000</td>
<td>R 38 400 000</td>
<td>R 98 400 000</td>
</tr>
<tr>
<td>ACCESS / CIRCULATION SUB TOTAL</td>
<td></td>
<td>R 100 000 000</td>
<td>R 161 600 000</td>
<td>R 219 900 000</td>
<td>R 481 500 000</td>
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<tr>
<td>ACTIVITY NODES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duff’S Road Mixed Use Precinct</td>
<td>New mixed use activity node on the KwaMashu A side of the station to provide for intermodal transport facilities, informal, public square, public parking and mixed commercial and higher density housing opportunities</td>
<td></td>
<td></td>
<td></td>
<td>R 5 625 000</td>
</tr>
<tr>
<td>Thembalihle Station Mixed Use Precinct</td>
<td>New mixed use activity node on both sides of the station to provide for intermodal transport facilities, informal, public square, public parking and mixed commercial and higher density housing opportunities</td>
<td></td>
<td></td>
<td></td>
<td>R 56 250 000</td>
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<tr>
<td>Historic Quarter Mixed Use</td>
<td>Environmental upgrade of the historic quarter comprising the King’s Palace, Social Welfare Buildings and the local Cemetery</td>
<td></td>
<td></td>
<td>R 2 500 000</td>
<td>R 2 500 000</td>
</tr>
<tr>
<td>Pumula Road Commercial Node</td>
<td>Upgrade of public environment surrounding the mixed commercial facilities in the node</td>
<td></td>
<td></td>
<td>R 2 500 000</td>
<td>R 2 500 000</td>
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<tr>
<td>Sivumelwane/Kholwa Roads Commercial Node</td>
<td>Upgrade of public environment surrounding the mixed commercial facilities in the node</td>
<td></td>
<td></td>
<td>R 2 500 000</td>
<td>R 2 500 000</td>
</tr>
<tr>
<td>Central Umbando Recreation Node</td>
<td>Upgrade of public environment surrounding the node as well as upgrade of sports facilities to include field, new netball/basketball courts and ancillary change rooms, fencing and parking</td>
<td></td>
<td></td>
<td>R 2 500 000</td>
<td>R 2 500 000</td>
</tr>
<tr>
<td>Local Umbando Recreation Node</td>
<td>Upgrade of public environment surrounding the node as well as upgrade of sports facilities to including the field, new netball/ basketball courts change rooms and facility fencing</td>
<td></td>
<td></td>
<td>R 2 500 000</td>
<td>R 2 500 000</td>
</tr>
<tr>
<td>PROJECTS</td>
<td>Project Description</td>
<td>Estimated Costs</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>--------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>-----------------</td>
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<tr>
<td>109611 Local Recreation Node</td>
<td>Upgrade of public environment surrounding the node as well as upgrade of sports facilities to including the field, new netball/ basketball courts change rooms and facility fencing</td>
<td>R 2 500 000</td>
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<tr>
<td>Umholoba Local Recreation Node</td>
<td>Upgrade of public environment surrounding the node as well as upgrade of sports facilities to including the field, new netball/ basketball courts change rooms and facility fencing</td>
<td>R 2 500 000</td>
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<tr>
<td>New Primary School</td>
<td>New centrally located primary school (location to be confirmed)</td>
<td>R 50 000 000</td>
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<td></td>
<td><strong>ACTIVITY NODES SUB TOTAL</strong></td>
<td><strong>R 50 000 000 R 64 375 000 R 15 000 000 R 129 375 000</strong></td>
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<tr>
<td>HOUSING</td>
<td><strong>SHORT</strong></td>
<td><strong>MEDIUM</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crossroads (New Build)</td>
<td>Greenfields Housing to accommodate rationalisation of housing in KwaMashu A and to provide housing for rental</td>
<td>R 100 000 000</td>
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<tr>
<td>Duff's Road (New Build)</td>
<td>Greenfields Housing to accommodate rationalisation of housing in KwaMashu A and to provide housing for rental</td>
<td>R 125 000 000</td>
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<td></td>
</tr>
<tr>
<td>Malandela Road (New Build)</td>
<td>Greenfields Housing to accommodate rationalisation of housing in KwaMashu A and to provide housing for rental</td>
<td>R 125 000 000</td>
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<td></td>
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<tr>
<td>KwaMashu A Block Upgrades</td>
<td>Conversion of 25% of existing settlement to New Build level, i.e. +/- 2500 households</td>
<td>R 625 000 000</td>
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<tr>
<td>KwaMashu A Block Upgrades</td>
<td>Reblocking of existing informal settlement within existing and newly defined urban blocks i.e. +/- 7500 households</td>
<td>R 40 000 000 R 47 500 000 R 100 000 000 R 187 500 000</td>
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<tr>
<td></td>
<td><strong>HOUSING SUB TOTAL</strong></td>
<td><strong>R 140 000 000 R 47 500 000 R 975 000 000 R 1 162 500 000</strong></td>
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<tr>
<td>ENGINEERING INFRASTRUCTURE</td>
<td><strong>SHORT</strong></td>
<td><strong>MEDIUM</strong></td>
<td></td>
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<tr>
<td>Water</td>
<td>To provide upgraded reticulation within the local street network for KwaMashu A</td>
<td>R 6 900 000</td>
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<tr>
<td>Sanitation</td>
<td>To provide upgraded reticulation within the local street network for KwaMashu A</td>
<td>R 7 500 000</td>
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<td>Storm Water</td>
<td>To provide upgraded reticulation within the local street network for KwaMashu A</td>
<td>R 5 000 000</td>
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<tr>
<td>Electricity</td>
<td>To provide upgraded reticulation within the local street network for KwaMashu A</td>
<td>R 10 000 000</td>
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<tr>
<td></td>
<td><strong>ENGINEERING SUB TOTAL</strong></td>
<td><strong>R 29 400 000 R 0 R 0 R 29 400 000</strong></td>
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<td></td>
<td><strong>GRAND TOTAL</strong></td>
<td><strong>R 319 400 000 R 273 475 000 R 1 209 900 000 R 1 802 775 000</strong></td>
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</tbody>
</table>

**NOTES:**
- Short Term – immediate to 5 years
- Medium Term – 5 to 10 years
- Long Term – 10+ years
- New Build Housing based on cost of R 250 000 / unit
- Reblocking costs based on R 25 000 / unit
12 References


StatsSA (2011) Community Profiles

http://wp.wpi.edu/capetown/projects/p2012/mtshini-wam/mtshini-wam/what-is-reblocking/