Royal HaskoningDHV
Enhancing Society Together

DRAFT

PLANNING AND DEVELOPMENT FRAMEWORK

SOUTH EASTERN DISTRICT

Local Area Plan

CITY OF CHOICE
PIETERMARITZBURG
MSUNDUZI

This report represents the draft report of the:

Planning and Development Framework

prepared in June 2014 as part of the South Eastern District Local Area Plan
Contract No. SCM 66 of 11/12 for:

The Msunduzi Municipality

by a multi-disciplinary team of professional consultants consisting of:

Royal HaskoningDHV (Pty) Ltd

Project Principal - Tony Markewicz | Project Manager - Toni Redman | Urban Planning - Anton Martens | Transportation Planning - Derek McGuigan
Infrastructure Planning - Ian Rushton/Angus Ovendale | Environmental Planning - Janet Loubser/Luke Moore

in association with:

Glen Robbins
Development Economist

Sopna Nair
Architect and Urban Design Specialist

Yasmin Coovadia
Development Finance and Housing Specialist

and with the assistance of representatives of The Msunduzi Municipality, Project Working Group and Project Management Team

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1 INTRODUCTION

1.1 BACKGROUND AND PURPOSE

The Msunduzi Municipality (MM) has appointed Royal HaskoningDHV (Pty) Ltd (RHDHV), under Contract No. SCM 66 of 11/12, to assist the municipality with the preparation of a Local Area Plan (LAP) for the South Eastern District (SEDis) of Pietermaritzburg.

The purpose of this document is to outline the vision, objectives, concepts, frameworks and guidelines for the development of the SEDis area. This report represents part of the Phase 4 deliverable for the SEDis LAP. The report is in draft form and provides the basis for further public and stakeholder engagement to test the proposals, obtain feedback and to refine the document accordingly.

This report is informed by the earlier phases of the project and should be read in conjunction with the previous project reports prepared as part of Phase 2 and 3 of the project:

- **Phase 2** – Status Quo Technical Notes for Planning, Transportation, Infrastructure, Environment, Urban Design, Economic and Finance
- **Phase 3** – Synthesis of Issues and Vision Development

1.2 STUDY AREA

As per the Terms of Reference (ToR), the SEDis study area is located along the south-eastern edge of the Msunduzi Municipal boundary and includes the settlements of Shenstone/Ambleton to the west and Ashburton/Lynnfield Park to the east together with the intervening lands. The study area borders onto Mkhambathini Municipality in the east and Richmond Municipality to the south.

Figure 1-1 shows the study area for the SEDis LAP (green area) in relation to the Msunduzi Municipality boundary (solid red outline) and adjacent municipalities, the Pietermaritzburg CBD (dashed blue circle), existing settlement (grey areas), river systems (blue lines) and the major road network (black lines).

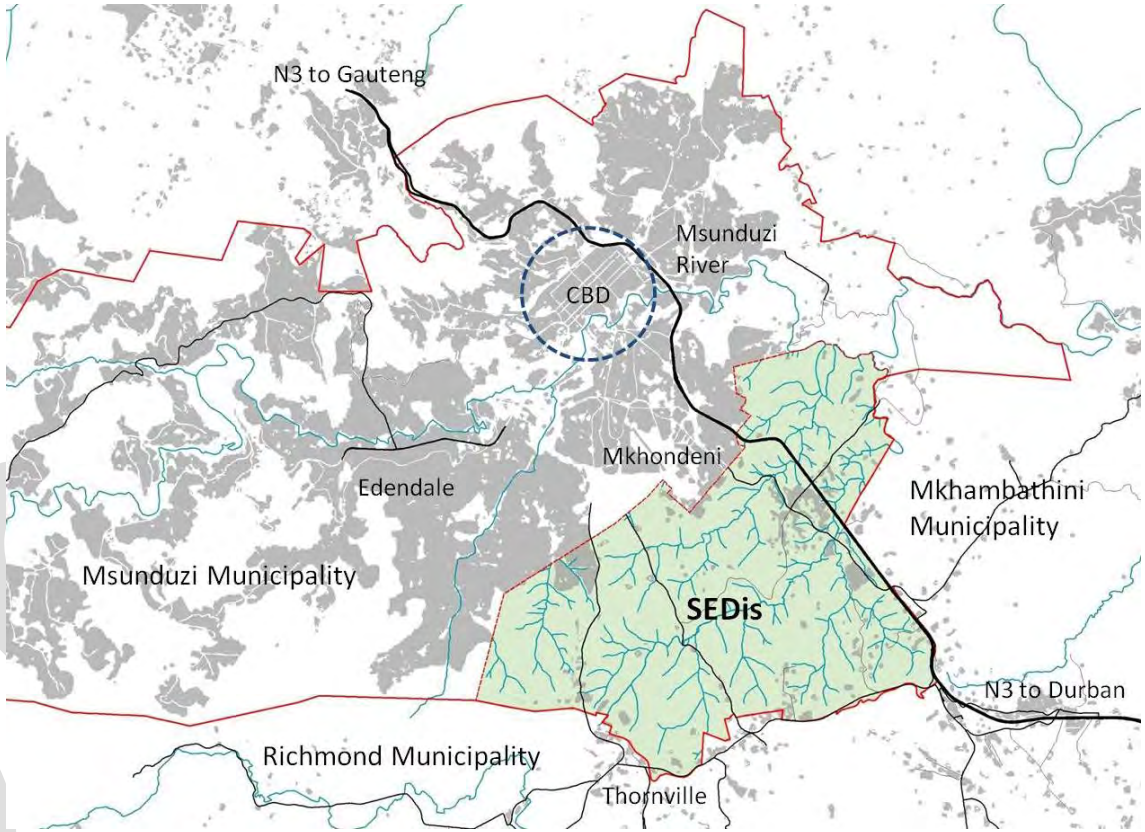


Figure 1-1 : SEDis Study Area and Context

1.3 METHODOLOGY

The project has been based primarily on a desktop study that reflects the synthesis of information relevant to the understanding of, and planning for, the SEDis study area. Where necessary, the information contained in existing reports has been augmented by information derived from engagement with key municipal and private stakeholders, the public and community groups and interactions with the Project Working Group and Project Steering Committee.

Key data sources include:

- **Existing Policies** – existing planning policy documents, including national, provincial, district and local policy, such as the Msunduzi Integrated Development Plan (IDP) and Spatial Development Framework (SDF).
- **Planning and GIS Data** – this includes development application registers located at the Municipal Offices; GIS data related to land use and ownership, transport, infrastructure and the environment from Msunduzi Municipality; and Census 2011 data.
- **Strategic Assessments** – this includes site visits and strategic assessments of the key development and environment sectors, including land use, urban design, transport, infrastructure, etc. undertaken by the project team and sector specialists.
- **Stakeholder Engagement** – this includes: workshop and interviews with key municipal officials responsible for planning, development, management and service delivery; interviews with private business stakeholders; and input from the Public Open Days and community meetings.

Figure 1-2 shows a diagrammatic representation of the project methodology and the current milestone/phase in the process.

1.4 Structure of the Report

The remainder of the report is structured as follows:

- **Section 2** – sets out the strategic assessment that has informed the preparation of the Development Framework.
- **Section 3** – outlines the development scenarios explored for the future growth and development of the SEDis area.
- **Section 4** – sets out the conceptual framework for the area, including the vision, strategic objectives, strategies and development concept for the SEDis area.
- **Section 5** – sets out the spatial development frameworks for the SEDis area, including open space and environment, movement and circulation, land use and activity, public space and landscape, built form and infrastructure.
- **Section 6** – identifies the precinct structure for the area, provides more detailed guidelines for the development of each precinct and outlines the strategic interventions for the area.
- **Section 7** – provides an implementation framework, including proposed actions and monitoring and review programme.
- **Section 8** – contains a number of appendices with additional information in relation to the open space system, population estimates and community facilities.

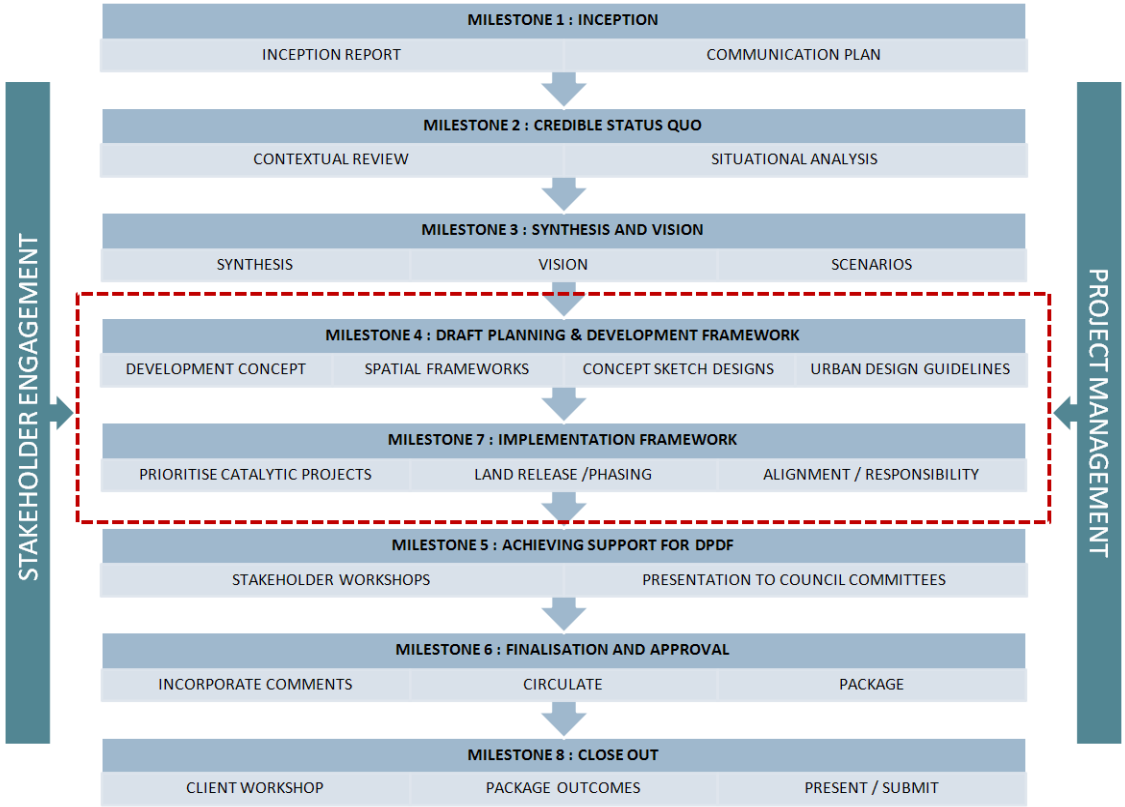


Figure 1-2 : Project Methodology

2 Strategic Assessment

The preparation of the Development Framework has been guided by a number of key informants, including existing spatial planning policy, the regional context, the attributes and potential of the local area and the engagements with the public and stakeholders. The Status Quo and Synthesis reports prepared as part of Phase 2 and 3 of the project set out these issues in detail and include assessments of planning, urban design, environment, transport, infrastructure, economic and finance issues. It is useful, however, to outline the key strategic informants that have guided the preparation of the Development Framework.

2.1 Regional Context

At a regional and sub-regional level, the SEDis area is strategically positioned by virtue of its location:

- At the convergence of major transportation routes, including the N3/R103, the NATCOR railway line and the regional transport network south/west of the N3.
- Along the Durban-Johannesburg N3 logistics/economic corridor between existing significant economic nodes at Durban/Pinetown and Pietermaritzburg/Howick and in close proximity to emerging nodes at Camperdown and Cato Ridge.
- On the edge of the Msunduzi municipal area at the interface between different urban, rural and natural landscapes with varying potential for development and environmental sensitivities.
- Within the Msunduzi River catchment, which feeds into the Umgeni River before discharging into the sea at Durban.

At a regional level, the area has an important potential role to play in terms of supporting the development of the N3 freight/logistics/economic corridor and associated economic/investment/industrial nodes. At a municipal/local level, the SEDis area also has significant potential to contribute to the urban growth, restructuring, resilience and sustainability of Msunduzi through the strengthening of radial and concentric linkages, the utilisation of more innovative development approaches, the integration of land use and transport, climate change resilience, food security, catchment management to protect downstream assets, etc.

2.2 Policy Context

A wide range of existing planning, economic, environmental, transport and infrastructure policy documents have been considered to inform the Development Framework, including national, provincial, district and local policy. Key policies informants include the following:

National	• National Spatial Development Perspective • National Development Plan • National Infrastructure Plan (Strategic Integrated Projects)
Provincial	• KZN Provincial Growth and Development Strategy and Plan • KZN Provincial Spatial Economic Development Strategy
District	• uMgungundlovu Integrated Development Plan and Spatial Development Framework • uMgungundlovu Strategic Environmental Assessment • uMgungundlovu Biodiversity Sector Plan
Local (Msunduzi)	• Msunduzi Integrated Development Plan (IDP) and Spatial Development Framework (SDF) • SDF Reviews for CBD, Ashburton and Eastern Areas ABM and Greater Edendale-Imbali ABM • Ashburton Town Planning Scheme • Greater Edendale Development Initiative • Msunduzi Environmental Management Framework • Msunduzi Strategic Environmental Assessment • Msunduzi Strategic Environmental Management Plan • Msunduzi Environmental Services Management Plan • Mkhondeni Strategic Environmental Assessment • Mpushini Strategic Environmental Assessment
Local (Adjoining)	• Mkhambathini Integrated Development Plan and Spatial Development Framework • Mkhambathini Urban Scheme and Rural Land Use Management Policy • Richmond Integrated Development Plan and Spatial Development Framework

Existing spatial planning policy emphasises the national and provincial importance of the N3 as a mobility, freight, logistics and industrial corridor. It also stresses the need for sustainability to be a central consideration of land use, environmental, transport and infrastructure planning.

The Msunduzi SDF identifies the SEDis area as a significant location in terms of the residential, industrial and mixed use growth and expansion of Msunduzi. It also identifies the importance of conserving critical environmental resources in the area. Figure 2-1 indicates the planning principles set out in the SDF to structure development along transport routes and around nodes. The SEDis area is shown indicatively (in black dashed outline) in the southeast portion of the municipal area.

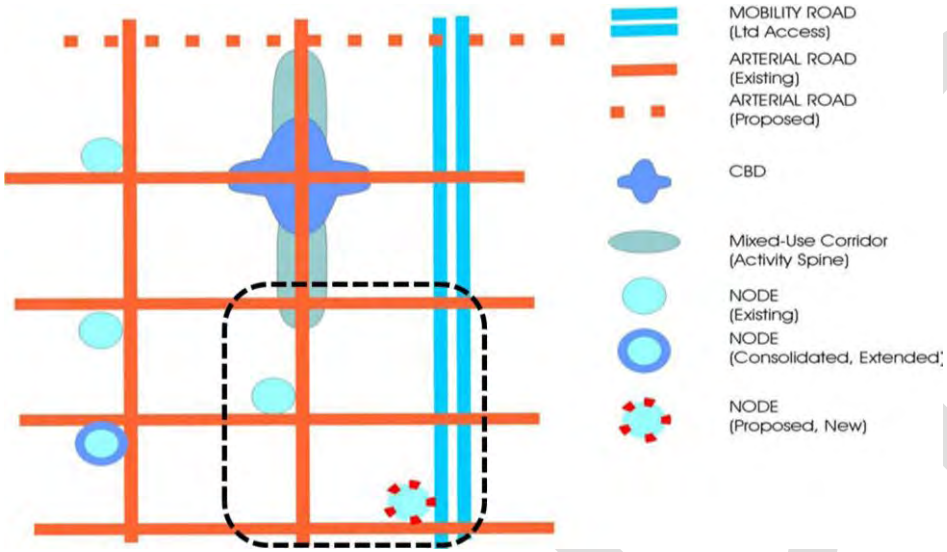


Figure 2-1 : Msunduzi SDF Planning Principles

Figure 2-2 indicates the strategic planning intentions for the SEDis area as set out under the SDF. This shows the economic nodes and investment areas along the N3 and Richmond Road and around Mkhondeni, residential growth around existing settlements at Ashburton, Lynnfield Park, Ambleton and Shenstone and environmental, agricultural and tourism areas in the central and peripheral areas of SEDis.

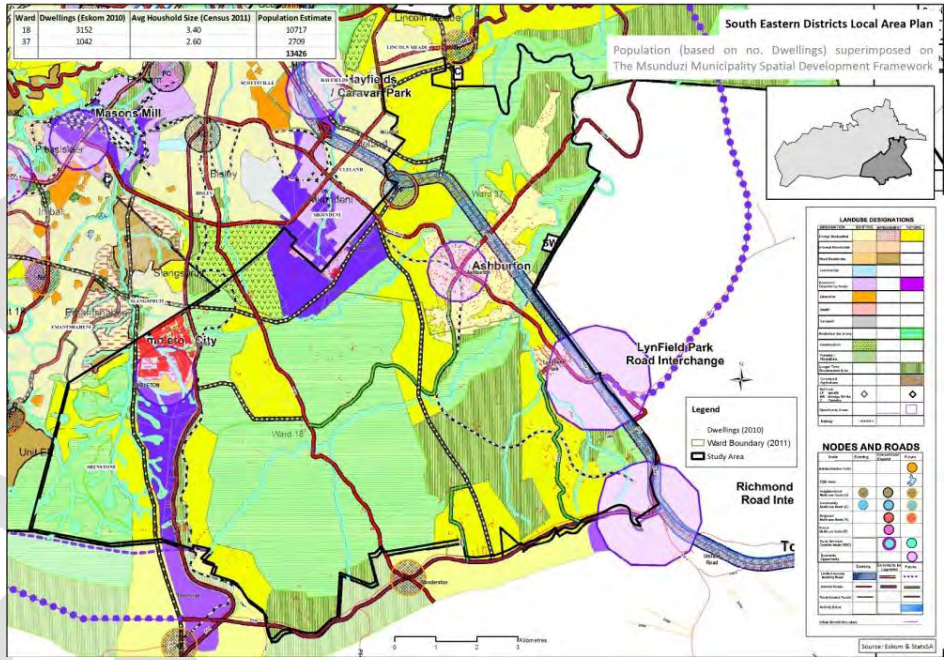


Figure 2-2 : Msunduzi SDF Nodes and Land Uses

2.3 Stakeholder Engagement

A critically important component in preparing the Development Framework has been engagement with municipal and private stakeholders, the general public, community and environmental interest groups, etc. This has helped to highlight issues of concern to local communities and interested and affected groups, involve the municipality as integral roleplayers in the planning process for the project and identify the particular attributes and potential that the area possesses.

A clear outcome from this process has been the need to consider different and sometimes divergent viewpoints on what the role of the area is currently and what it should be in the future. The Development Framework accordingly needs to recognise, balance and accommodate different developmental, community and environmental objectives and visions for the future of the area.

3 Development Scenarios

3.1 Development Drivers and Capacity

The SEDis area is being impacted by a wide range of development trends and drivers, including population growth and associated housing demands, economic growth and associated development pressures and planning applications, particularly along the N3 corridor, environmental conservation concerns and initiatives, tourism activities, agricultural practices, etc. The key growth drivers generate demands for development lands with appropriate levels of access, infrastructure, amenity, etc.

The SEDis covers a large area of approximately 11 500ha and there are substantial lands available for a wide variety of land uses. The availability and capacity of transport and service infrastructure to support land use development in the area is variable. The areas with highest accessibility and services tend to be located on the edges of SEDis where existing transport routes and settlements are concentrated. Many parts of the SEDis area have low or no service infrastructure provision, particularly the central area and the peripheral areas to the northeast and southwest.

There will accordingly need to be significant investment in the area to ensure that development opportunities can be supported, serviced and realised while at the same time protecting valuable environmental, tourism and agricultural resources.

3.2 Population Growth

A number of population growth scenarios have been explored in order to inform the generation of land demand and associated land use and infrastructure requirements for the area. This includes a low, medium and high growth scenario, as set out below.

Table 3-1 : Msunduzi Population Growth Scenarios

Growth Scenario	Scenario 1: Low Growth Rate	Scenario 2: Medium Growth Rate	Scenario 3: High Growth Rate
Annual Growth Rate	1.12%	1.74%	2.50%
Basis for Growth Rate	Msunduzi population grew by 65,699 from 552,837 in 2001 to 618,536 in 2011 (Census 2011), representing a growth rate of **1.12% p.a. – used for Scenario 1: Low Growth Rate**	• Msunduzi population projected to grow by 93,735 (**0.83% p.a.**) from 707,758 in 2011 to 801,493 in 2026 (Msunduzi SDF Review 2009) • Approximately 90,000 mismatch between 2011 Census and SDF population figures • Difference between Census 2011 population and SDF 2026 population is approximately 180,000 • Annual growth rate from 2011 Census population to 2026 SDF population would be **1.74% p.a. – used for Scenario 2: Medium Growth Rate**	Assumed higher population growth rate of **2.5% p.a. – used for Scenario 3: High Growth Rate**

Based on the above growth scenarios, the following population increases can be calculated for Msunduzi from 2011-2026 and 2011-2036:

Table 3-2 : Msunduzi Population Growth 2011-2026 and 2011-2036

Growth Scenario	Scenario 1: Low Growth Rate	Scenario 2: Medium Growth Rate	Scenario 3: High Growth Rate
Annual Growth Rate	1.12%	1.74%	2.50%
2026 Population	731 260	801 493	963 659
Population Change 2011-2026	112 724	182 957	345 123
2036 Population	817 603	952 627	1 146 731
Population Change 2011-2036	199 067	334 091	528 195

The population of SEDis has been estimated at 15,864 in 2011 (based on Census 2011). This represents 2.56% of the 2011 Msunduzi population of 618,536. The SEDis area will absorb a proportion of Msunduzi's population growth. The extent of population that is accommodated in the SEDis area will depend on a range of factors, including the number and size of public and private housing projects, investments in

infrastructure and facilities, the relative attractiveness of the area in relation to other areas and housing options available in Msunduzi, etc.

For the purposes of the Development Framework, three growth share options have been examined for SEDis, as out below.

Table 3-3 : SEDis Population Share Scenarios

Share Scenario	Scenario 1: Low Share	Scenario 2: Medium Share	Scenario 3: High Share
Share	2.56%	10.00%	15%
Basis for Share	Based on a continuation of the existing share of Msunduzi's population, i.e. **2.56%**	Based on the recognition that the SEDis area contains significant lands for development, that significant expansion pressures are being exerted in the west (i.e. from the Edendale area) and in the east (i.e. expansion from Bellevue) and the area will accordingly act as an expansion area for Msunduzi and the area will therefore absorb a significantly increased share of population growth, assumed to be **10%**	Similar basis to Medium Share but recognises that in period 2026-2036, the SEDis area is likely to absorb a greater share of the Msunduzi population than the preceding 2011-2026 period, assumed to be **15%**

Based on the above share scenarios, the following population increase can be calculated for the SEDis area from 2011-2026 and 2011-2036:

Table 3-4 : SEDis 2026 and 2036 Population based on Current Share of Msunduzi Growth

Growth Scenario	Scenario 1: Low Growth Rate	Scenario 2: Medium Growth Rate	Scenario 3: High Growth Rate
Total Population in 2026	18 755	20 556	22 976
Population Change 2011-2026	2 891	4 692	7 112
Total Population in 2036	20 970	24 433	29 411
Population Change 2011-2036	5 106	8 569	13 547

Table 3-5 : SEDis 2026 and 2036 Population based on Increased Share of Msunduzi Growth

Growth Scenario	Scenario 1: Low Growth Rate	Scenario 2: Medium Growth Rate	Scenario 3: High Growth Rate
Total Population in 2026	27 136	34 160	43 593
Population Change 2011-2026	11 272	18 296	27 729
Total Population in 2036	40 088	56 830	81 229
Population Change 2011-2036	24 224	40 966	65 365

Note: Scenario 2 (Medium Share of 10%) has been applied to the 2011-2026 period and Scenario 3 (High Share of 15%) has been applied to the 2026-2036 period.

3.3 Residential Land Demand

The above population growth scenario has been used as a basis for calculating the residential land demand in SEDis. The Msunduzi average household size was 4 in 2001 and 3.6 in 2011 (Census 2011), i.e. it is on a decreasing trend. Utilising the 2011 average household size of 3.6 as a proxy for occupancy ratio and applying it to the 2011 SEDis population of 15,864 generates a total of 4,407 dwelling units in 2011. In order to calculate the future growth in dwelling units in SEDis, it has been assumed that the average household size will be 3.5 for the period 2011-2026 and this has been used as a proxy for occupancy ratio and applied to the 10% SEDis share scenario.

Table 3-6 : SEDis 2026 and 2036 Dwelling Units based on Increased Share of Msunduzi Growth

Growth Scenario	Scenario 1: Low Growth Rate	Scenario 2: Medium Growth Rate	Scenario 3: High Growth Rate
Total Dwelling Units in 2026	7 627	9 634	12 329

No. of Additional Dwelling Units 2011-2026	3 221	5 227	7 923
Total Dwelling Units in 2036	11 328	16 111	23 082
No. of Additional Dwelling Units 2011-2036	6 921	11 705	18 676

Note: Scenario 2 (Medium Share of 10%) has been applied to the 2011-2026 period and Scenario 3 (High Share of 15%) has been applied to the 2026-2036 period.

Using the medium growth rate (Growth Scenario 1), the 10% SEDis share (Share Scenario 2) for 2011-2026 and 15% SEDis share (Share Scenario 3) for 2026-2036 as the most likely outcome given the growth potential and pressures in SEDis, the residential land demand generated by the additional dwelling units can be estimated as follows for 2026 and 2036 based on different density assumptions:

Table 3-7 : SEDis 2026 and 2036 Residential Land Demand based on Increased Share of Growth

Scenario	Scenario 1: Low Growth Rate	Scenario 2: Medium Growth Rate	Scenario 3: High Growth Rate
2026 Land Demand for Low Density (10du/ha)	322ha	523ha	792ha
2026 Land Demand for Medium Density (25du/ha)	129ha	209ha	317ha
2026 Land Demand for High Density (50du/ha)	64ha	105ha	158ha
2036 Land Demand for Low Density (10du/ha)	692ha	1 170ha	1 868ha
2036 Land Demand for Medium Density (25du/ha)	277ha	468ha	747ha
2036 Land Demand for High Density (50du/ha)	138ha	234ha	374ha

Note: Scenario 2 (Medium Share of 10%) has been applied to the 2011-2026 period and Scenario 3 (High Share of 15%) has been applied to the 2026-2036 period.

Using the medium growth, medium density scenario above, residential land demand would accordingly be of the order of a total of 210ha in 2026 and 470ha in 2036. Table 8-1 in the Appendix provides additional information in relation to the assumptions and estimates used for generating the above population, dwelling unit and residential land figures.

3.4 Non-Residential Land Demand

The demand for land for future non-residential development, including industrial, commercial, community facilities, transport, etc. has also been estimated based on available data, current trends and relevant assumptions.

The Economic and Business Report carried out by Clive Coetzee for Pietermaritzburg and uMgungundlovu provides some useful data in extrapolating economic land demand trends for SEDis. The report notes that industrial and warehouse space expanded by 54 342m^2 in 2007 and that commercial space increased by 24 811m^2 during 2007. Typical average Floor Area Ratios (FARs) for industrial and commercial development are 0.5 and 1.0 respectively. Applying these FARs to the 2007 increases generates additional industrial land development of 10.9ha and additional commercial land development of 2.5ha.

Based on existing industrial growth trends in Msunduzi and the stronger logistics/ industrial outlook given the focus on the N3 corridor, it has been estimated that Msunduzi can potentially expect logistics/industrial land demand growth of up to 10ha pa over the next 20 years or so, which would generate a total of 120ha from 2014-2026 or 220ha from 2014-2036. Given the significant logistics/industrial development envisaged for SEDis and the N3 corridor in the SDF and other strategic planning policy, the SEDis area's strategic location along the N3 corridor and the availability of development lands in SEDis, together with the relatively limited industrial expansion opportunities in the remainder of the Msunduzi area, it has been assumed that the SEDis area will absorb approximately 80% of future

logistics/industrial growth in Msunduzi. This equates to 8ha pa, or 96ha of industrial development land up to 2026 and 176ha up to 2036.

In relation to commercial development, based on existing commercial growth trends and the stronger commercial outlook for Msunduzi and the SEDis area given Msunduzi's increasing dominance in the district and location along the N3 corridor, it has been estimated that Msunduzi can expect an average of up to 2.5ha pa of commercial growth, which equates to 30ha of additional commercial development land from 2014-2026 or 55ha from 2014-2036. Given the significant urban growth envisaged for SEDis, the area's strategic location along the N3 corridor, the availability of development lands in SEDis and likely significant growth in other parts of Msunduzi, it has been assumed that the SEDis area will absorb approximately 20% of future commercial growth in Msunduzi. This equates to 0.5ha pa, or 6ha of commercial development land from 2014-2026 or 11ha from 2014-2036.

In relation to land demands for social and community uses, this has been based on an estimate of the requirement for a variety of facilities to serve the growing population in SEDis based on applicable standards for population thresholds and site sizes per facility (see Table 5-2 and Table 8-3). This suggests that there will be a requirement for a total of 58.4ha of lands for the development of social and community facilities to serve the 2026 population and 106.2ha to serve the 2036 population.

There will also be a demand for land for transport and infrastructure development. This will typically increase with increasing levels of settlement/urban development and it has accordingly been assumed that the land demand for transport and infrastructure will be of the order of 5% of residential land demand, or 10.5ha for the period 2011-2026 and 23.5ha for the period 2011-2036.

Based on the above estimates for residential and non-residential land demand, the following rounded land demands can be attributed to SEDis up until 2026 and 2036.

Table 3-8 : SEDis 2026 Land Demand for New Development

2026 Land Demand	Approximate Area	Basis for Calculation
Residential	210ha	Medium Growth Scenario with 10% SEDis Share and Medium Densities
Logistics/Industrial	100ha	80% of Estimated Msunduzi Additional Industrial Land Demand
Commercial	6ha	20% of Estimated Msunduzi Additional Commercial Land Demand
Social Facilities & Amenities	60ha	Applicable Population Thresholds and Average Site Sizes
Transport & Infrastructure	11ha	5% of Residential Land Demand
Total Land Demand	**387ha**	Represents 3.4% of Total SEDis Area of 11,500ha

Table 3-9 : SEDis 2036 Land Demand for New Development

2036 Land Demand	Approximate Area	Basis for Calculation
Residential	470ha	Medium Growth Scenario with 10%/15% SEDis Share and Medium Densities
Logistics/Industrial	180ha	80% of Estimated Msunduzi Additional Industrial Land Demand
Commercial	11ha	20% of Estimated Msunduzi Additional Commercial Land Demand
Social Facilities and Amenities	110ha	Applicable Population Thresholds and Average Site Sizes
Transport & Infrastructure	24ha	5% of Residential Land Demand
Total Land Demand	**795ha**	Represents 6.9% of Total SEDis Area of 11,500ha

The total estimated land demand for residential and other urban uses would accordingly be of the order of 400ha up to 2026 and 800ha up to 2036. The estimated land demand represents only 3.4% of the total SEDis area of 11 500ha in 2026 or 6.9% in 2036. There would accordingly be significant additional lands available in the SEDis area for conservation, agriculture and tourism uses, future growth, etc.

4 Conceptual Framework

4.1 Role of SEDis

The status quo analysis and stakeholder engagement process has helped to identify the key existing and emerging roles that the SEDis area performs and which will underpin the vision and objectives for the area. The area performs a number of social, economic and environmental roles at a range of scales from local to national. The roles highlighted in red are considered to be of particular importance for the area.

Table 4-1 : SEDis Roles

CURRENT ROLES	SOCIAL	ECONOMIC	ENVIRONMENTAL
National	• Recreational role with Comrades Marathon (Polly Shorts)	• Potential economic support role linked to national Durban-Gauteng SIP2 N3 Corridor	• National biodiversity assets – endemic species • Heritage and archaeological significance (Stone-Age)
Provincial	• Accommodate urbanisation • Recreational role with Amashova cycling race (R56 and R623)	• Contribution to the Durban to Pietermaritzburg N3 Corridor at a provincial level	• Protected area – contributes to provincial conservation assets • Waste dilution role for upper catchments in provincial riparian network
Local	• Provides for a small-holding lifestyle and suburban/peri-urban residential choices • Expansion opportunities to accommodate population growth • Recreational and adventure activities • Local social services and activities, e.g. cemetery	• Local employment potential linked to agriculture, tourism and new logistics • Local industrial and commercial opportunities • Tourism potential linked to natural environment/ landscape and Bisley • Support to agricultural hinterland, i.e. agri-industry	• Local biodiversity and environmental assets • Environmental support role to Msunduzi CBD and city centre • Eco-tourism significance – natural assets and landscape • Landscape and sense of place • Agricultural significance

4.2 Vision for SEDis

The vision developed for SEDis responds to the informants outlined above and is guided by the following key principles:

- Exploring and applying the concepts of resilience and sustainability in environmental, economic and social terms.
- Recognising the wide ranging needs and varied potential of the area and developing an integrated vision that balances competing needs and development potentials.
- Working with existing community, institutional, environmental, land and infrastructural resources and capacity to develop an optimum outcome for the area.
- Adopting an integrated approach to the development and management of the area employing innovative spatial planning and design concepts.

Based on the status quo analysis, input received through the stakeholder engagement process and the synthesis of issues and key principles outlined above, a vision has been developed for the SEDis area as follows:

The SEDis area will be developed as a sustainable and productive district of the city that performs a range of social, economic and environmental roles for the city and local communities within SEDis. This will focus on facilitating the consolidation of existing and future anticipated population and economic growth in the area into a spatial pattern that supports and enhances the roles and characteristics of existing and/or new development nodes, corridors and settlements and that protects and enhances tourism, agricultural and environmental resources. It will do this through: the integration of existing development and activities with new opportunities for housing, business, industry, commerce, logistics, tourism and productive uses; the development of a more efficient, transport oriented urban form; the promotion of increased connectivity, access, public transport and NMT usage; the support of an appropriate mix of land uses, activities, facilities, amenities and services that provide opportunities for a diverse range of working, living and recreational options; and through the conservation and management of environmental resources.

The urban form will be more compact and will be defined by an integrated open space system that provides for the protection of biodiversity and the delivery of environmental services, including the recreational and cultural needs of the local and municipal population, whilst enhancing the resilience of the natural systems and local communities with respect to the implications of global environmental change. The open space system will structure land uses and activities and will be complemented by appropriate buffers and/or land use management of adjoining areas and the protection and enhancement of agricultural/productive/tourism/recreational/ environmental uses to improve the food supply/security, tourism base, recreational offering and environmental sustainability of the municipality.

4.3 Strategic Objectives

The strategic objectives for the development and management of the SEDis area are as follows:

Protect Biodiversity and Environmental Services

- Establish an Appropriate Balance between Development and Environmental Management Needs
- Establish a functional Open Space System (OSS)
- Protect, Rehabilitate and Enhance Environmental Services
- Mitigate for Effects of Climate Change
- Identify Institutional and Implementation Agents and Resources
- Promote Multi-functional Role of OSS for Biodiversity, Recreation, Tourism, Flood Management, Visual Amenity, etc.

Develop Sustainable Human Settlements

- Improve Housing Delivery and Choice
- Provide Social Facilities and Amenities to Address Backlogs and Serve Future Growth
- Improve Integration between Housing, Facilities, Transport and Employment
- Provide Suitable Level of Services to Address Basic Needs and Higher Order Economic Demand

Promote Local Economic Development and Employment Generation

- Support and Strengthen Existing Economic Sectors and Activities
- Expand and Diversify the Local Economic Base of SEDis
- Identify Sufficient Lands in Appropriate Locations and with Appropriate Service Levels for different forms of Economic Development
- Encourage Employment Generating Development

Improve Physically Connectivity and Access

- Establish Improved Regional Access and Integration
- Improve Local Connectivity, Internal Circulation and Access
- Adopt a Strategic Approach to Development within the N3 Corridor
- Improve Public Transport and NMT
- Utilise Transport Routes to Structure and Support Development
- Improve Traffic Management Systems
- Improve Integration between Living and Working

Provide Supporting Infrastructure and Services

- Provide Infrastructure and Services to Meet Basic Needs
- Upgrade and Extend Water Supply and Sanitation Infrastructure to Support Development and Protect Environmental Resources
- Promote Improved Electricity Supply and Telecommunications Network and Capacity
- Identify Appropriate Infrastructure Service Levels for Social and Economic Needs
- Identify/Secure Funding Streams to Construct and Maintain Service Infrastructure

Develop Appropriate Approaches to Land Use Management/Development and Urban Design

- Develop an Appropriate Role and Vision for the Area
- Balance Competing Demands for Land
- Identify Appropriate Locations for Different Forms of Development
- Establish an Appropriate Land Use Framework for the Area
- Reserve Appropriate Areas for Non-urban, Agricultural and Conservation Purposes
- Develop Urban Design Guidance for different forms of Development

Provide Appropriate Guidance and Mechanisms for Public and Private Investment/Developments

- Develop a Shared Agreement/Vision for Area with buy-in from Key Stakeholders and Communities
- Align Local Development Proposals with Broader Development Frameworks in Msunduzi and Surrounding Municipalities
- Promote Public and Private Partnerships and Co-ordination
- Identify Opportunities to Utilise Publicly Owned Land for Social and Economic Development Needs
- Identify/Secure Funding for Development Implementation and Improve Institutional Capacity and Delivery

4.4 Development Strategies

The spatial development strategies for SEDis are as follows:

4.4.1 Protection

- **Contain and prevent urban sprawl** from eroding the city agricultural and environmental asset base located along the river corridors and central areas of SEDis.
- **Protect and where possible enhance and expand the natural asset base** contained in the river systems and catchments of the Msunduzi, Mkhondeni, Mpushini and Slangspruit Rivers so as to protect biodiversity and ecological functioning, maximise opportunities for local and regional recreation, environmental services provision and to support climate change mitigation initiatives.

4.4.2 Expansion

- **Promote the development of the edge corridors for a mix of uses appropriate to the character and potential of each corridor** to accommodate the expansion of residential areas and associated economic activity.
- **Provide for improved and additional private and public transportation network elements that will effectively link and integrate the existing and future settlements** into the networks of the city and surrounding areas and which will provide for efficient separation of regional, metropolitan and local traffic.

4.4.3 Consolidation

- **Consolidation, expansion and enhancement of the existing areas of Ashburton, Lynnfield Park, Ambleton and Shenstone** as identifiable and discrete urban settlements providing a balanced living environment for existing and future new residents in SEDis.
- **Consolidation of environmental assets** contained in Msunduzi, Mkhondeni, Mpushini and Slangspruit catchments into an integrated open space system that will provide for biodiversity conservation and enhancement and for the recreation needs of the population.

4.4.4 Creation

- Provide capacity through existing and new transportation networks for **increased and improved public transportation options** to serve the existing settlements and neighbourhoods and proposed growth areas.
- Promote **higher net densities** in residential areas through the identification of land for a wider mix of housing types that cater for a mix of income groups and lifestyle options.

4.5 Spatial Development Concept

The spatial development concept for SEDis has been formulated to respond to the need to generate an approach that will contribute towards achieving long term sustainability socially, economically and environmentally. The concept has been conceived at a number of different spatial scales to ensure that the development of the area is connected into the sub-regional and city systems and integrated internally:

Sub-Regional and City Systems

- **Sub-Regional System** – Connect SEDis into the **broader spatial structure** and economy, including the N3 economic/industrial/logistics corridor and associated nodes, the R56 Richmond Road urban/residential corridor, the R603 agricultural corridor and the MR477 tourism corridor**.**

- **City System** – Develop SEDis area as a **productive, sustainable and integrated interface** between urban, rural, agricultural and natural landscapes that protects the assets and amenities of the area, supports the resilience and sustainable growth of Msunduzi and that completes the radial connectivity system linking Edendale to the N3 corridor.

The above regional and city scale elements are illustrated in Figure 4-1 and in the spatial development concept shown in Figure 4-3.

District Systems

- **Mobility and Accessibility Network** – Utilise the existing major transport routes to connect the SEDis area to surrounding areas and opportunities, to structure development within SEDis and provide access to and link the settlement and economic growth areas within SEDis.
- **Edge Nodes and Corridors** – Develop a system of **nodes and corridors** with more intensive uses along the district edges and integrate these edges with adjoining land use areas and corridors, including Mkhondeni, Edendale, Richmond and Mkhambathini.
- **Central Core** – Retain the central area of SEDis as a **productive agricultural/ rural/tourism/conservation core** that supports the development of a resilient city in terms of climate change, food production, protects downstream environmental assets and services, etc.
- **Local Role and Character** – Each movement route, node and corridor has a particular character, role and potential and this should be developed accordingly. Key corridors include the N3/R103 economic and settlement corridor, the Dardenelles Road rural/agricultural corridor and the Richmond Road settlement and mixed use corridor.

The above district scale elements are illustrated in the concept sketches illustrated in Figure 4-2 and in the spatial development concept shown in Figure 4-3.

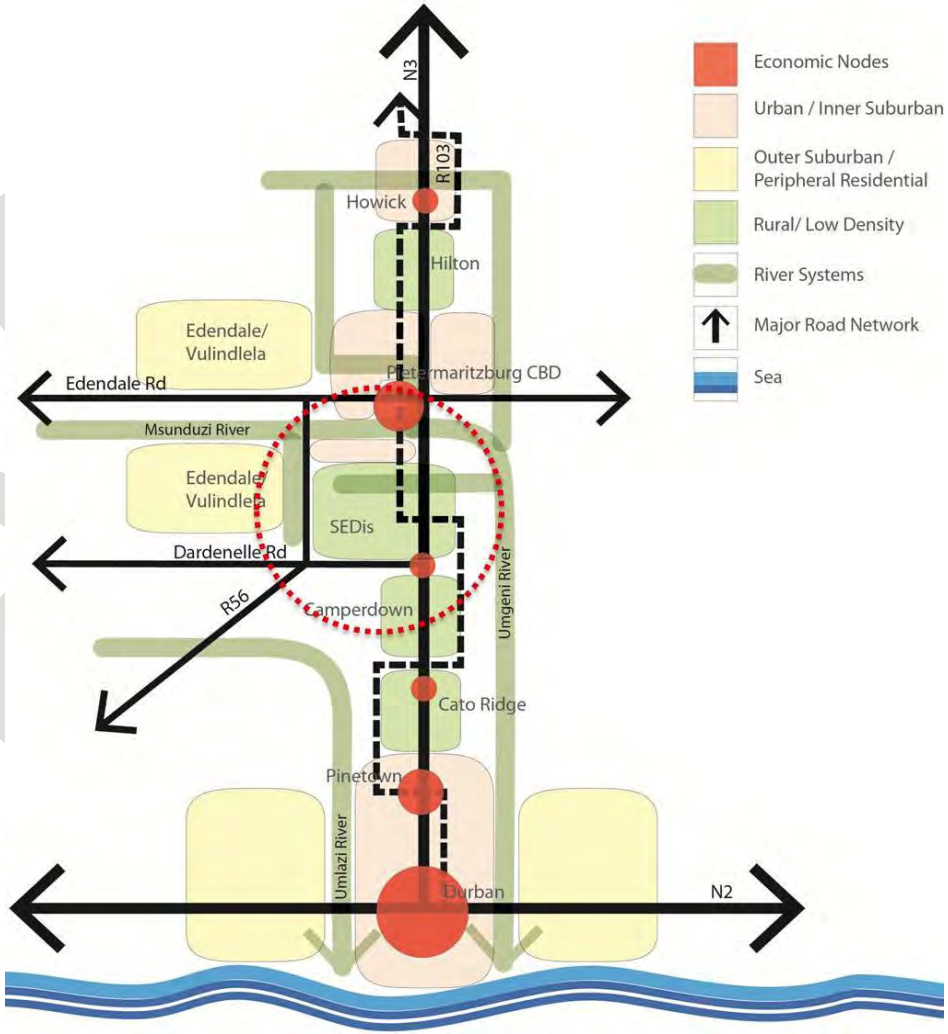
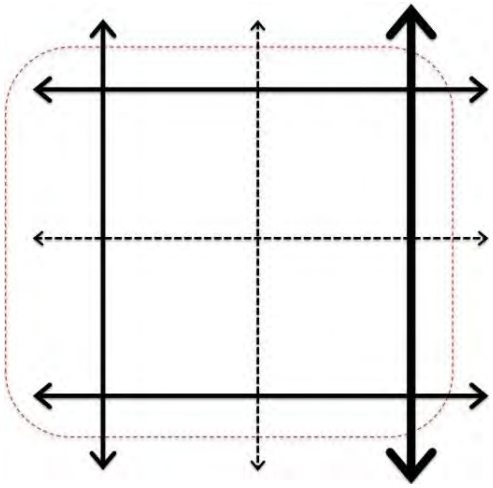
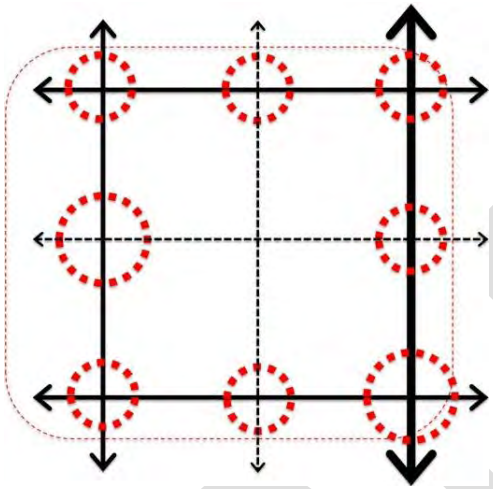


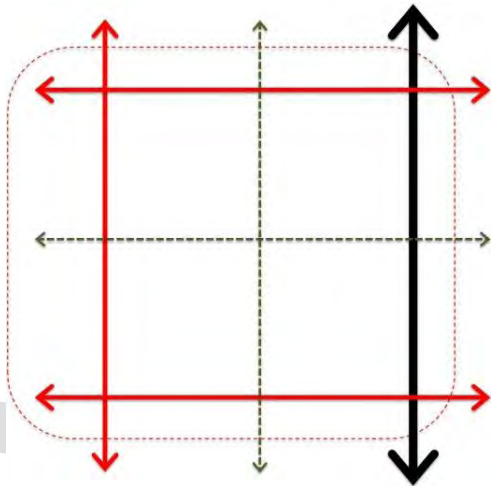
Figure 4-1 : Regional and City System Concept



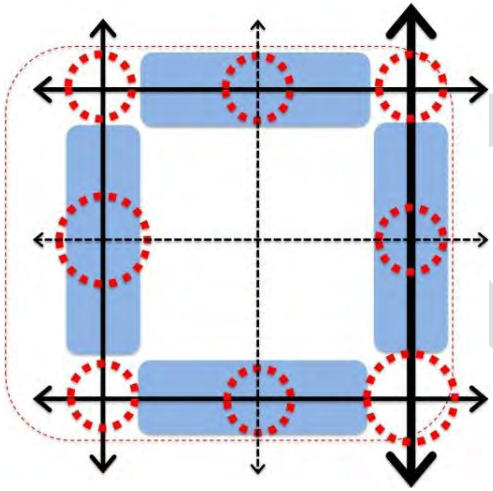
Major movement corridors are located around the edges of the SEDis area, typically on flatter land or along ridge lines, with the central areas having steep topography and more constrained linkages and access



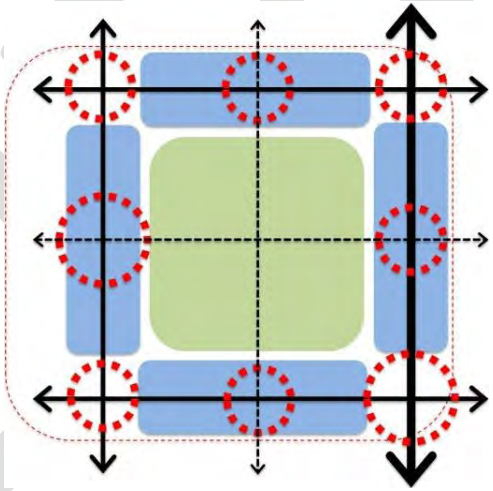
Junctions of major movement routes create points of highest accessibility for the location and development of nodes with a concentration of social and/or economic activities



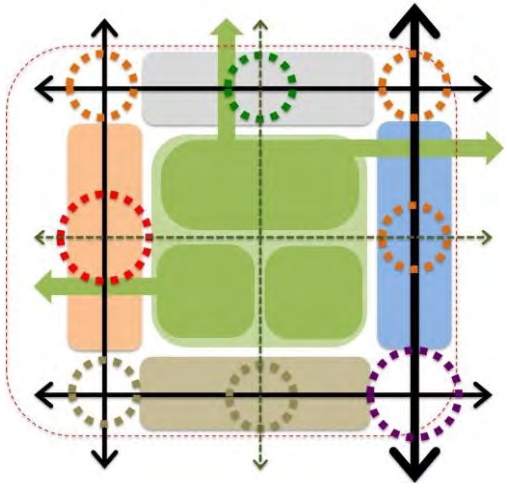
Each movement route performs different roles in terms of mobility and access and has different potential to support linkage, development, placemaking and/or scenic functions



Major movement routes generate access and opportunities for the development of edge corridors with appropriate supporting land use, transport and infrastructure development



Central area has more limited access and development potential but significant potential as an environmental, agricultural, tourism and recreational core for Msunduzi and SEDis



Each edge node and corridor and each catchment in the central core have a different context, character, role and potential and should have different types, mixes and intensities of uses and qualities that respond to this

Figure 4-2 : District System Concepts

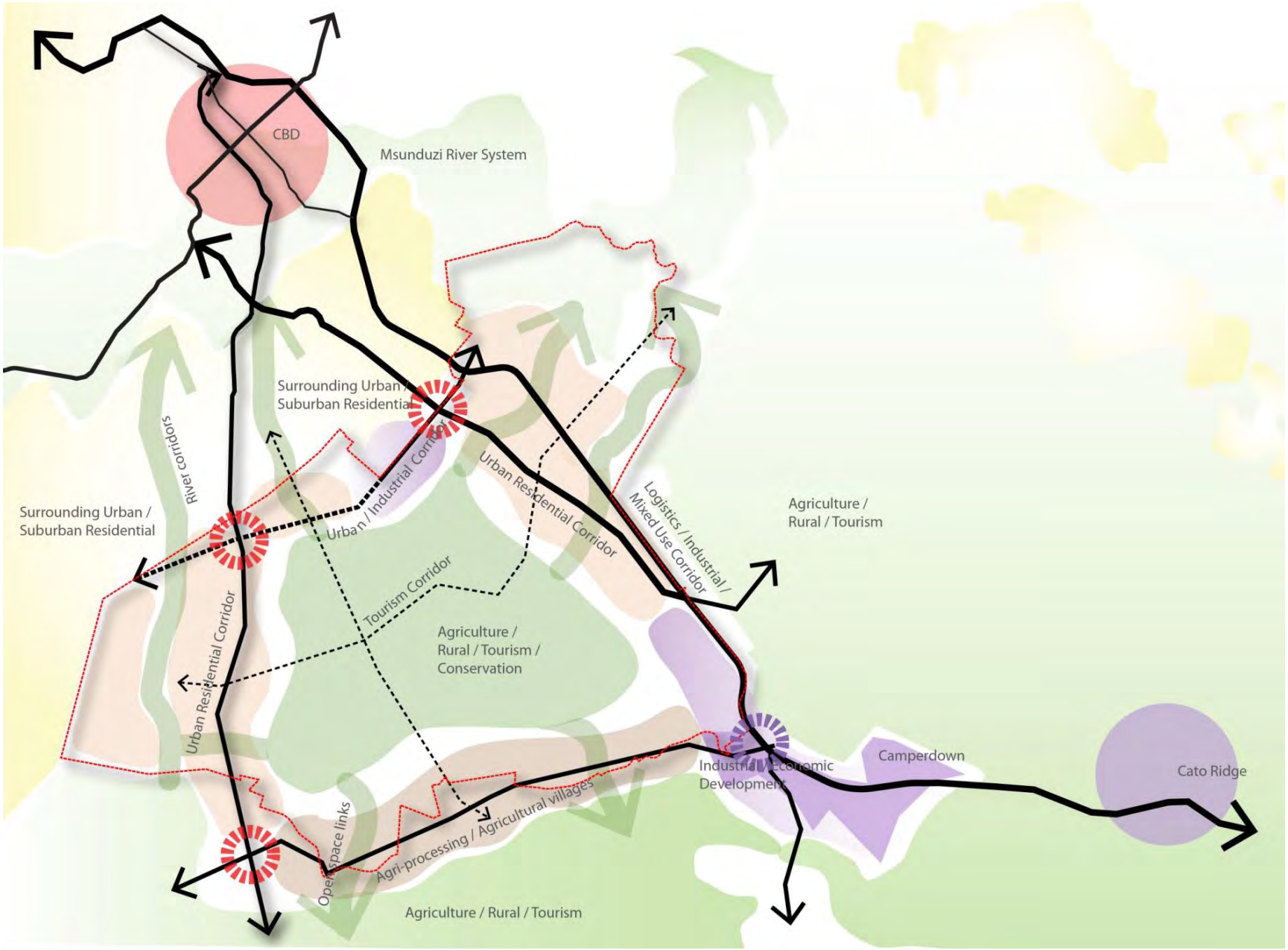


Figure 4-3 : Spatial Development Concept

5 Spatial Development Frameworks

The development concept has formed the basis for generating spatial frameworks that will both accommodate and guide development and investment in SEDis. This includes the following:

- Open Space and Environmental Framework
- Movement and Circulation Framework
- Land Use and Activity Framework
- Public Space, Landscaping and Built Form Framework
- Infrastructure and Services Framework

5.1 Open Space and Environmental Framework

5.1.1 Objective

The objective is to protect, enhance and expand the existing environmental asset base within the existing built areas and also to utilise the opportunity to establish a more robust and integrated open space system within the undeveloped areas that will directly meet the needs of the local communities, as well as respond to wider city and regional environmental planning needs with regard to environmental services planning and management. A key element is to establish a functional and integrated Open Space System (OSS) that will play a multi-functional role in terms of biodiversity and conservation, recreation and tourism, stormwater and flood risk management, landscape and visual amenity, etc. The framework seeks to establish an open space system and associated environmental management that will:

- Maintain and protect the environmental assets of SEDis and Msunduzi.
- Maintain a sustainable supply of environmental goods, services and benefits for local communities.
- Provide a primary spatial structuring element that can help to organise, integrate and support land use and activity patterns.
- Maintain and strengthen resilience to climate change.
- Protect and provide agricultural resources and assets.
- Provide for recreational and tourism opportunities and amenities.

5.1.2 Concepts

Key concepts underpinning the framework are to:

- Conserve and sustainably utilise open spaces.
- Manage open spaces on a catchment basis.
- Promote integration and linkage between different parts of the OSS in SEDis and surrounding areas.
- Buffer open space system with amenity open spaces and low impact land uses and activities.
- Manage high impact land uses and activities to minimise and avoid environmental impacts.

5.1.3 Elements

The main elements necessary to establish an integrated open space and environmental management system that can provide a sustainable resource base and ecosystem services "engine" are as follows:

Open Space Cores and Corridors

- Protect open space cores as areas of high biodiversity, including protected areas, wetlands, high priority habitats/areas, etc. This includes the major river systems of the Msunduzi, Mkhondeni and Mpushini together with the Bisley Valley Nature Reserve and Mpushini Protected Areas.
- Protect river corridors and associated wetlands, buffers and flood risk areas as critical linkages that integrate the open space system. This includes the key corridors associated with the main rivers and tributaries within SEDis, including Mkhondeni, Mpushini and Slangspruit.

Open Space Linkages and Stepping Stones

- Retain and establish open space linkages that create connections between catchments and with surrounding open spaces. This includes key linkages between the Mkhondeni and Mpushini River systems, between Mkhondeni and Bisley Valley Nature Reserve, between Mpushini and Slangspruit River systems and between the SEDis OSS and surrounding open spaces in Msunduzi, Mkhambathini and Richmond municipal areas.

- Retain and establish open space stepping stones outside of cores, corridors and linkages, including public open spaces, undeveloped lands (steep slopes, geologically unstable areas), agricultural areas, gardens, etc.

Buffer Areas and Adjacent Land Uses

- Accommodate and encourage low impact land uses and activities in buffer areas adjoining open space cores and corridors.
- Ensure the sustainable management of land uses adjoining the open space system and buffer areas to avoid and/or minimise environmental impacts on the open space system.

The open space system has been mapped based on a wide range of available information from existing documents and GIS data, including Msunduzi environmental reports, the Mkhondeni SEA and project level information. Appendix 8.1 provides additional information in relation to the data sources and methodology used to identify and define the open space system. The LAP also recommends that the open space system be further refined through the ongoing environmental studies being undertaken Msunduzi Municipality (refer to Table 7-2 for the relevant project).

5.1.4 MANAGEMENT

Key management interventions necessary to establish, secure, manage and sustainably utilise the OSS for SEDis are to:

- Refine the delineation and role of the OSS footprint through more detailed levels of assessment and stakeholder engagement.
- Identify high priority areas within the OSS requiring designation as Protected Areas and/or more formal management arrangements.
- Avoid the encroachment of development into the OSS footprint and the removal or fragmentation of habitats within the OSS.
- Designate/zone the OSS to protect it from inappropriate development and promote the sustainable use of the OSS.
- Control development adjoining the OSS to minimise and avoid adverse impacts to the OSS.
- Ensure that proposed developments that incorporate or adjoin parts of the OSS include provision for the effective management of the OSS, or the interface with the OSS, so as to maintain the ecological functioning of the OSS and the delivery of environmental services.
- Ensure that any developments proposed within the OSS or the adjoining Irreplaceable C-Plan areas (refer to Figure 5-1) are subject to project level Environmental Impact Assessment and include an Environmental Management Plan that provides acceptable management proposals for the OSS.

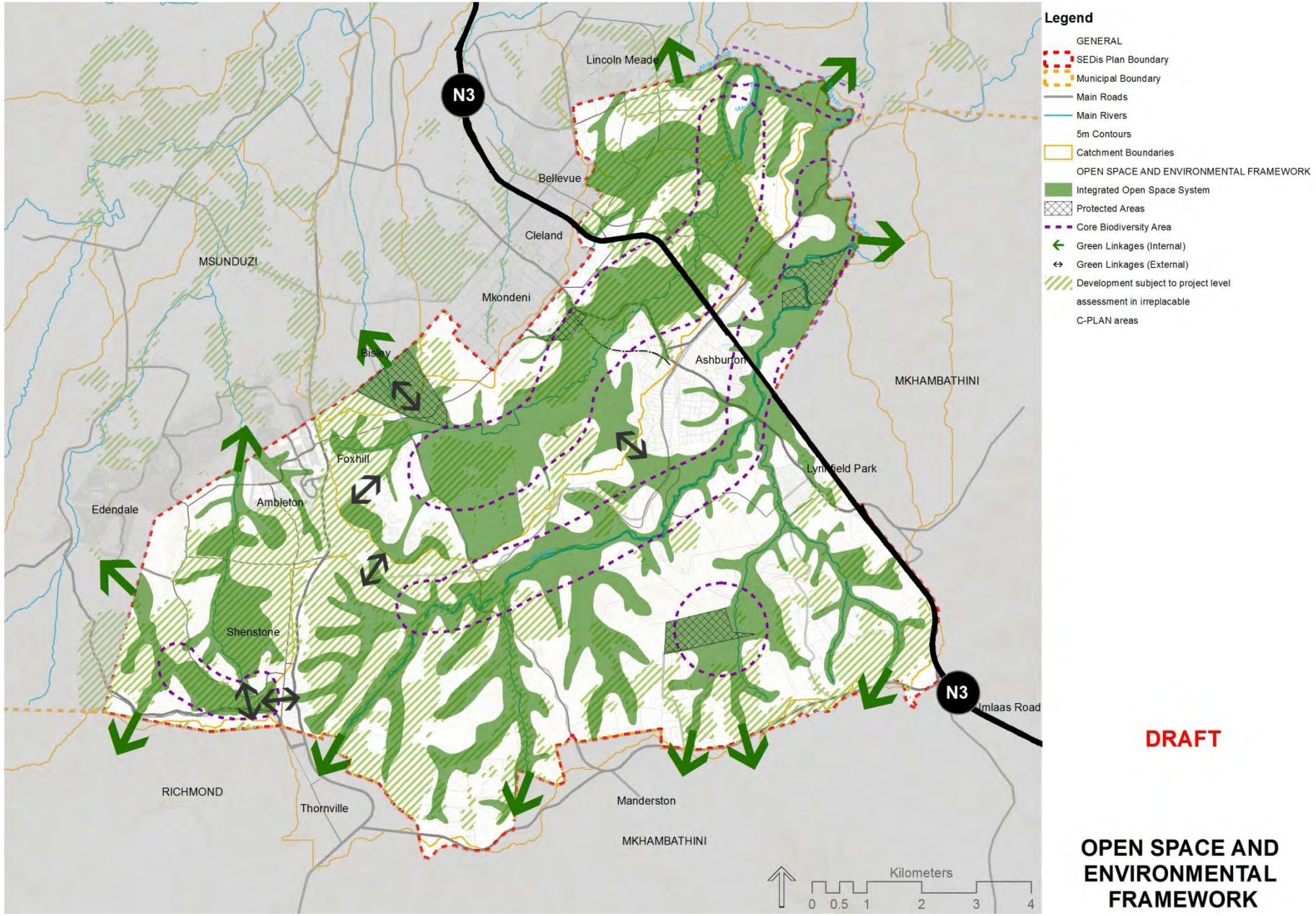


Figure 5-1 : Open Space and Environmental Framework

5.2 Movement and Circulation Framework

5.2.1 Objective

The objective is to develop a sustainable and integrated multi-modal transport system that is accessible, safe and convenient and that:

- Supports improved regional access and integration between SEDis and surrounding areas in Mkhambathini, Richmond and Msunduzi (CBD, economic nodes, etc.).
- Promotes improved local connectivity, internal circulation and access, particularly within and between settlements within SEDis.
- Encourages more sustainable transport modes, including public transport and NMT, and reduces the dependency on the use of private vehicles.
- Structures and supports development along the four main corridors around the edges of SEDis.

5.2.2 Concepts

Key concepts underpinning the Movement and Circulation Framework for SEDis are to:

- Establish a clear hierarchy in the transport network.
- Provide greater integration and linkage between different parts of SEDis and surrounding areas.
- Promote greater integration between land use and transport, e.g. transit oriented development.
- Encourage a modal shift from private transport to public transport and NMT.
- Improve the pedestrian environment and create walkable communities.

5.2.3 Elements

The main elements necessary to establish a sustainable and integrated transport system are as follows:

Regional Access

Access to the study area will be gained via the regional and city access and movement network made up of the N3, R103, Richmond Road, Dardenelles Road, Shortts Retreat Road and rail lines and will be via a series of existing interchanges on the N3, existing intersections on the regional and city road network and existing rail stations. The capacity of the N3 regional mobility route will need to be retained and developments that generate significant local traffic movements on the N3 should be avoided.

Route Hierarchy

Establish a clear movement network hierarchy that facilitates the appropriate levels of mobility and accessibility for each route type, that supports the public transport system and which informs an appropriate land use and density response that will reinforce the public transport system. The key elements of the network hierarchy are as follows:

- **Regional Mobility Route** – N3 regional mobility route connecting Durban and Johannesburg with limited access provided at key interchanges.
- **Urban Linkage Route** – major linkage routes and edge corridors including R103, Richmond Road, Dardenelle Road and a future linkage to Edendale
- **Local Linkage Route** – minor linkage routes providing local connectivity including Shortts Retreat Road, Bisley Road and a number of other local routes
- **Local Access Route** – local routes providing access to adjoining lands
- **Proposed Linkage** – proposed extensions/improvements to the route network to facilitate connectivity, access and/or development potential

Road Network

The road network will need to be strengthened, upgraded and extended in order to increase capacity to serve existing and future development, support public transport and NMT and improve connectivity and accessibility. The existing edge corridors will need to be strengthened and utilised to create the main edge development corridors (R103 Old Main Road, R56 Richmond Road, P338 Dardenelles Road). Other existing routes within the road network include the local linkage routes (Shortts Retreat Road,

Bisley Road) and local access routes. Key additional linkages required within the SEDis area include the following:

- **Edendale Urban Linkage Route** – major route connectivity Edendale and Ambleton/Shenstone to employment opportunities along N3 corridor
- **Ambletone/Shenstone Activity Spine, Local Linkages and Local Access Routes** – activity spine with associated linkages and access routes to serve existing and future development in Ambleton/Shenstone areas and connect to existing adjoining areas
- **Mkhondeni-Richmond Road Local Linkage Route** – local linkage route connecting Richmond Road/Ambleton/Shenstone areas to employment opportunities in Mkhondeni
- **Mkhondeni-Hilcove Hills Local Linkage Route** – local linkage connecting Mkhondeni and R103 to Hilcove Hills and provide greater integration between local areas across the N3
- **Hilcove Hills Activity Spine, Local Linkage and Access Routes** – activity spine with associated linkages and access routes to serve future development in the Hilcove Hills area and connect to existing adjoining areas
- **P478 Ashburton Realignment and Local Street** – investigate the potential to realign the P478 connection to the R103 by shifting it north of Ashburton and allowing the existing route to become an intensive mixed-use activity street
- **D352-Lynnfield Park Local Access Route** – improved local connectivity between the western edges of Ashburton and Lynnfield Park
- **D354 Local Linkage Route** – upgrade local linkage route to create an activity spine for future residential/mixed use development from Lynnfield Park to Dardenelles Road

Interchanges and Intersections

Existing interchanges on the N3 include:

- N3/P1 (R103) at Lynnfield Park
- N3/P478 at Ashburton
- N3/P338 at Umlaas Road

No new interchanges are proposed on the N3 within the SEDis area. The existing interchanges will, however, require upgrading to increase capacity to service future development within the key nodes along the N3/R103.

Existing major intersections along the edge corridors of the Old Main Road (P1/R103), Richmond Road (P5/R56) and Dardenelles Road (P338) include:

- P1/P478 at Ashburton
- P1/D354 at Lynnfield Park
- P5/P338 at Thornville
- P338/P120 (Bisley Road) at Manderston

New/formalised/upgraded intersections are proposed along Richmond Road at Foxhill, Ambleton and Shenstone. A preliminary review indicates that adequate sight distances can be achieved at these intersections but this will need to be confirmed through more detailed study and any works required to achieve adequate sight distances identified.

These intersections will provide access to the mixed use nodes, activity spine and growing settlement areas within these areas. Road based public transport and pedestrian access will need to be facilitated from these intersections to the adjacent nodes, spines and settlement areas.

Public Transport

The R103 and Richmond Road, in conjunction with the parallel activity spine in Ambleton/Shenstone, will be the major public transport corridors in the area carrying IRPTN bus feeder routes into Msunduzi. The major public transport nodes, including bus stops and support facilities, will be located at the Ambleton, Foxhill and Shenstone nodes along Richmond Road and at the Ashburton and Lynnfield Park nodes along the R103. A future public transport corridor and associated nodes will need to be considered along Dardenelles Road.

The existing rail network is comprised of an eastern goods and future passenger line with stations at Ashburton and Mkhondeni, a western goods line with stations at Thornville and Foxhill and a southern line with a station at Manderston. The potential of the existing rail network and stations to carry significant passenger volumes should be retained and Msunduzi should co-ordinate with PRASA regarding improvements to the rail service in the area.

Non-Motorised Transport

The pedestrian network should operate at two levels. In the first instance, high quality pedestrian links to all the primary transport nodes and stops along the public transport corridors should be provided for on existing roads and within development/ redevelopment areas. In the second instance, public pedestrian links in and along the open spaces should be promoted. These should link all open space and/or recreation areas and should enable walks and trails in these areas. A high quality pedestrian environment should be encouraged within activity nodes and spines and within walking distance of these nodes and spines.

Tourism and Scenic Routes

The routes with significant tourism and scenic potential include P120, D352, P477 and P478. These routes should be promoted as tourism and scenic routes linking tourism assets and areas, including Bisley Valley Nature Reserve, existing protected areas and conservancies and tourism assets in SEDis, Msunduzi and the adjoining Mkhambathini area.

5.2.4 MANAGEMENT

Key management interventions necessary to establish a sustainable and integrated transport system are to:

- Review the IRPTN proposals for the SEDis area to incorporate stops and support facilities in the proposed mixed use nodes.
- Undertake/finalise detailed studies for proposed road linkages and activity spines.
- Improve the pedestrian network and environment in the activity nodes, spines and local neighbourhoods.
- Improve traffic management systems, including the removal of heavy traffic from R103.

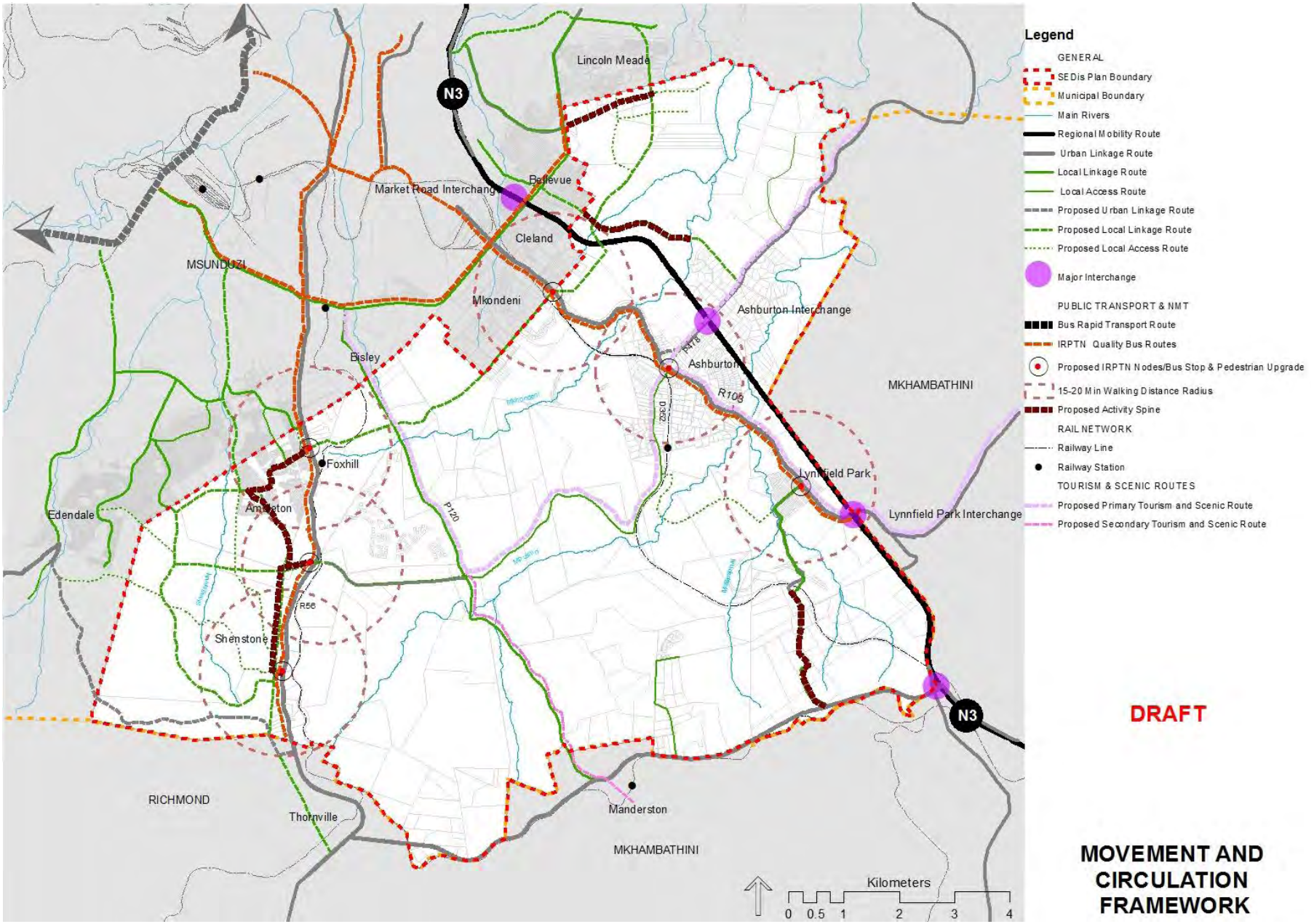


Figure 5-2 : Movement and Circulation Framework

5.3 Land Use and Activity Framework

5.3.1 Objective

The objective is to promote the development of an appropriate mix, pattern and intensity of land uses and activities that:

- Provides for the sustainable growth and efficient expansion of Msunduzi and the SEDis area and the creation of competitive economic zones for industry, agriculture, etc.
- Promotes the integration of land use and transport, e.g. transit-oriented development.
- Balances competing demands for lands for different uses, including social, economic and environmental uses.
- Provides for a variety of lifestyle options from urban to small holding and rural.

5.3.2 Concepts

Key concepts underpinning the Land Use and Activity Framework for SEDis are to:

- Support more compact and structured urban settlement and economic development with higher densities (up to 100 units/ha) in appropriate, accessible locations, such as around activity nodes and spines.
- Promote the establishment of identifiable and discrete settlements and neighbourhoods.
- Promote more sustainable land use patterns and densities and encourage greater integration between compatible/complementary land uses, particularly places of residence and employment.
- Promote the productive and recreational use of the landscape for agriculture, tourism, recreation and amenities.
- Ensure the provision of an appropriate range of regional and local level community facilities.

5.3.3 Elements

The main elements necessary to develop a sustainable and balanced land use pattern are as follows:

Urban/Residential Settlement

The SEDis area will need to accommodate a variety of lifestyle options through the establishment of both urban and suburban settlement types. These types include detached housing, semi-detached housing, row housing (terrace), 3-4 storey walk ups, duplex complexes and medium-rise buildings (up to 3-4 storeys) which can be accommodated by/provided by both public and private sector housing. Mono-functional housing "estates" which obviate integration and regional mobility should be avoided. Land uses that can associate with and be mixed with residential uses such as home business, community facilities, local neighbourhood shopping, etc. should be encouraged and facilitated.

Consolidate and structure the existing eastern and western settlements of Ashburton, Lynnfield Park and Ambleton and upgrade existing informal settlements in Shenstone. The neighbourhoods along the Richmond Road and R103 corridors require infill development and the intensification of residential development, particularly in the vicinity of public transport nodes.

New residential areas are to be established as extensions to Ambleton/Shenstone, Lynnfield Park and Ashburton along key growth corridors/activity spines. These areas must accommodate mixed use higher density residential developments with adequate support facilities and services.

Urban/residential settlement areas will also need to accommodate a range of supporting social and economic uses in order for them to perform as integrated human settlements. This will include social facilities, local commercial services, recreational facilities and amenity areas to serve local communities and residents. These supporting uses will need to be appropriately located to serve the residential thresholds. Higher order social and commercial facilities should be located in urban mixed use nodes and more local facilities located in neighbourhood nodes. Recreational facilities and amenities could be located within residential areas or at the

interface between residential areas and surrounding open space, agricultural or rual lands, provided that adequate access can be provided.

Sufficient lands also need to be retained for medium and longer term settlement growth for residential uses and supporting social and economic uses.

Table 5-1 : Density Targets for SEDis

Spatial Element	Minimum Net Density[1]	Applicability
Within and in Proximity to Mixed Use Urban Nodes	60-100du/ha	Richmond Road node at Ambleton (central node)
Within and in Proximity to Mixed Use Local Nodes	60-100du/ha	Richmond Road nodes at Fox Hill (north) and Shenstone (south) R103 nodes at Ashburton and Lynnfield Park Dardenelles Road node south of Lynnfield Park
Within and in Proximity to Neighbourhood Nodes	40-80du/ha	Ambleton/Shenstone nodes west of Slangspruit River
Within and in Proximity to IRPTN Bus Stops	60-100du/ha	In the residential areas that are within 2km proximity to major public transport facilities and within 400-800m of all existing and proposed rail stations and city bus or taxi ranks
Within and in Proximity to Activity Spines	60-100du/ha	In the residential areas that are within 2km of the R103 and other recognised activity spines
Other Areas ***Urban*** ***Suburban*** ***Rural***	 40-80 units/ha 15-40 units/ha 1-15 units/ha	Subject to local context and adequate services, including waterborne sewerage for densities greater than 10du/ha
Interface with OSS and Environmentally Sensitive Areas	5-15du/ha	Within 400m proximity to the Open Space System – must take cognisance of local context

Community Facilities

The efficient and sustainable provision of social facilities requires the provision and operation of different social services which can be best achieved by clustering compatible services in accessible locations. The range of services provided to an area will be based on availability to all residents within reasonable access times. The co-location with other facilities in as close proximity as possible to identified development nodes, is also a key criteria for the provision of new facilities.

At present, there is a backlog of community facilities within SEDis. Existing community facilities are concentrated primarily in the western settlements, particularly Ashburton, and the eastern settlements are underprovided with facilities. A range of community facilities are required to serve the needs of existing communities, particularly in the eastern settlements, and additional facilities will also be required to serve future residential settlement growth in SEDis. The eastern settlements are likely to experience significant population growth in the future and these areas will require a commensurate investment in community facilities.

The population of SEDis was 15,864 in 2011 and is estimated to grow to 34 160 by 2026, i.e. an additional 18 296 people (refer to assumptions and calculations in Section 3). Based on this population and an estimated average household size/occupancy ratio of 3.5, the required social facilities for the area indicated in Table 5-2. The standards used to calculate the required facilities are summarised in Table 8-3.

Table 5-2 : Required Community Facilities by 2026

Facilities	Existing/ (Planned)	Threshold per Facility	Required	Shortfall
EDUCATIONAL FACILITIES				
Crèche	2(1)	5 000pop	7	5
Primary School	4	3 500pop	10	6
Secondary School	0	8 000pop	4	4
HEALTH FACILITIES				
Mobile Clinic	1	900du	11	10
Satellite Clinic	1	15 000pop	2	1
Primary Health Clinic	0	40 000pop	1	1
Community Health Centre	0	85 000pop	0	0
Hospital (District/L1)	0	450 000pop	0	0
SOCIAL FACILITIES				
Cemetery	1 (1)	100 000pop	0	0

[1] Net Density – The number of dwelling units per hectare of land calculated on land used for residential purposes only.

Community Facility Sites	3[(1)]	750du	13	10
Community Hall	1	20 000pop	2	1
Library	1	10 000pop	3	2
Old Age Home/Welfare	0	5 000du	2	2
Worship	1	2 000pop	17	16
PUBLIC SERVICE AND CIVIC FACILITIES				
Fire Station	1	100 000pop	0	0
Police Station	0 in SEDis 1 in Thornville	4 500du	2	2
Post Office	1	10 000pop	5	4
CULTURAL OPEN SPACES				
Food Gardens	1[(1)]	6 000pop	6	5
Market -Trading Spaces	2 [(1)]	5 000pop	7	5
SPORTS AND RECREATION AMENITIES				
Sports fields	1	10 000pop	3	2
Play Areas	3[(1)]	2 500pop	14	11

Note: [(1)] Not known – assumed 25% of requirement is existing

The above table indicates the community facilities required to serve local demand. Given the size, location and potential of the SEDis area, there is also likely to be demand for regional scale facilities to be located in the area to serve Msunduzi and/or a wider regional catchment, such as a cemetery or community health centre. Regional facilities will need to be carefully sited and designed to ensure adequate access, connection to public transport, integration with adjoining land uses, etc.

Mixed Use/Economic Development

The SEDis area must provide for establishment of a mix of different activities in nodes, corridors and districts in a manner which attempts to encourage more vibrant, flexible and efficient living environments. Within each of the broader land uses, a further level of land use and activity structuring will occur by virtue of the manner in which similar related land uses are grouped together to form functional and identifiable land use or activity "clusters" in response to user demands for location and identity benefits (e.g. entertainment clusters, office clusters, hotel clusters, manufacturing clusters, etc). The following guidelines provide a framework for assisting in the distribution and location of economic activity/land uses within the local area.

Mixed Use Activity Nodes and Spines

Establish a system of mixed use/economic nodes at points of high accessibility along transport corridors, including economic/industrial development area between Umlaas Road and Lynnfield Park and mixed use nodes along Richmond Road and the R103. Encourage mixed uses along activity spines in Ambleton/Shenstone, Hilcove Hills and south of Lynnfield Park.

General Industry

The dominant types of activities within these areas are manufacturing, warehousing and distribution. General Industry has the potential to create dust, noise, odour and other adverse environmental impacts. In general products are produced for other industrial businesses and there is a high reliance on the use of raw materials in the production process.

General Industry should be accommodated in the existing Mkhondeni industrial area and new developments should be carefully controlled and appropriately sited and designed to avoid impacting on the existing amenity and character of adjoining areas.

Light/Service Industry

The dominant types of activities within these areas are light manufacturing and warehousing and distribution. Light Industry has limited impact on surrounding neighbourhoods. In general, goods are produced for end-users and limited raw materials are used by light industrial business.

Light/Service industrial activity can be located within the Mkhondeni industrial area and in the node identified at Umlaas Road and along the eastern edge of Richmond Road.

Business Parks

Business parks are essentially a blending of industrial warehousing and office space that have traditionally been developed in a land consumptive manner. The development of traditional business parks should not be encouraged in the SEDis area. If business parks are proposed, they should be developed in a more compact and intensive form and concentrated within the Umlaas Road node with good access to the R103 public transport corridor. The types of activities that should be supported

include light manufacturing, technology parks, with limited retail, short-term residential, community facilities and recreation opportunities.

Offices

Office development to serve the city and local areas is to be encouraged within the mixed use nodes along the public transport corridors and along the activity spines in Ambleton/Shenstone, Hilcove Hills and south of Lynnfield Park. Large scale mono functional office park developments with land consumptive built form and landscaping should be discouraged in favour of more compact and urban mixed-use residential, retail and office development forms. Where appropriate, office development is to be integrated with other land uses, including high density residential to optimise residential yields, increase net densities, create more mixed use environments and to increase thresholds for public transport.

Home offices are to be encouraged in residential areas provided they do not present a nuisance factor to neighbours.

Retail / Shopping

The location and distribution of this economic activity is determined primarily by the location and distribution of the thresholds that it serves. These are invariably residential areas or employment zones and the activity locates in positions that are most accessible to the people residing or working in them.

Retail and shopping development are to be encouraged and supported within the mixed use nodes along the public transport corridors and along the activity spines in Ambleton/Shenstone, Hilcove Hills and south of Lynnfield Park. These areas must be supported by high quality and well maintained public environments and linked to public transport. Wherever possible retail/shopping development should be integrated with other land uses including high density residential to optimise residential yields, increase net densities, create more mixed use environments and to increase thresholds for public transport.

Informal Trading Activity

Whilst there are initiatives at national and local levels to deal with informal trading it is an imperative for the harnessing of the energy within the activity as well as for its appropriate control that informal trading be addressed in a holistic manner. This requires that informal trading be recognised, acknowledged and accepted as a legitimate sector of the overall economy and accordingly that it be planned for spatially in the same manner as any other land use or economic activity.

Opportunities for informal traders through the provision of appropriate infrastructure and space to trade must be provided for within existing and future mixed use nodes, major public transport stops and proposed new employment districts. A key priority will be to facilitate the creation of a market with trading facilities within the central Ambleton node along the Richmond Road corridor.

Agriculture and Tourism

The SEDis area is a prime location for a range of agricultural activities that can generate economic activity and local employment, support food production and security and protect the existing environmental resources and landscape character. The area is also an important location for tourism development that generates economic activity and local employment and protects the existing environmental resources and landscape character.

The role of the central and southern parts and existing agricultural lands within SEDis as a productive, amenity and tourism area that protects environmental assets of SEDis and Msunduzi should be retained and strengthened. The central and southern parts of SEDis should be promoted as areas that accommodate a range of agricultural and tourism activities, including farming, sugar cane, game farms, tourist accommodation, etc. Urban agriculture should be encouraged within and adjacent to settlements to increase economic activity as well as to supplement food sources for poor families. Agri-industry should also be accommodated in suitable locations along the Dardenelles Road and Richmond Road corridors or with good access to these corridors.

The interface areas between settlements and the open space system should be developed, where appropriate, for agricultural fields or gardens to provide an appropriate buffer to protect the open space system and to provide urban agriculture opportunities in close proximity to settlements. Traditional medicine plantations should be identified and/or created and protected as part of the open space system

and as part of land that is able to generate economic activity. Other agricultural activities such as reed harvesting, woodlots and orchards should be encouraged in peripheral areas as a means of soil erosion control and as potential economic activity generators.

Rural and agricultural areas within SEDis with good access to major movement routes also have the potential to accommodate important future regional facilities, such as cemeteries, major health facilities, bulk infrastructure installations, etc. The accommodation of such facilities within these areas will need to be carefully sited, planned and designed to ensure that they can be adequately accessed and serviced, integrated with their context and the rural/agricultural landscape, avoid impacts on adjacent land uses and open space assets, etc.

Open Space/Conservation

Retain and protect the role of the open space cores and corridors within SEDis as conservation areas that deliver environmental services. Establish green linkages between the catchments within SEDis and between the open space system and surrounding environmental assets in Msunduzi, Mkhambathini and Richmond.

5.3.4 Land Use Schedule

The broad land use areas shown on the Land Use and Activity Framework have been estimated as follows:

Table 5-3 : Land Use Schedule

Land Use Area	Area (ha)	Area (%)
Existing Settlement and Infill/Consolidation	715	6.2%
Informal Settlement Upgrade	22	0.2%
Settlement Growth and Consolidation (Short Term)	643	5.6%
Settlement Growth and Consolidation (Medium Term)	1 012	8.8%
Settlement Growth and Consolidation (Long Term)	783	6.8%
Sub-Total for Urban/Residential Settlement Uses	**3 176**	**27.6%**
Existing Industry	51	0.4%
Proposed Economic/Industrial Development (Short to Medium Term)	341	3.0%
Proposed Economic/Industrial Development (Medium to Long Term)	181	1.6%
Emerging Services/Mixed Use Development	211	1.8%
Sub-Total for Economic/Mixed Uses	**784**	**6.8%**
Rural Settlement/Agri-Industry/Agriculture	1 265	11.0%
Rural /Agricultural/Tourism	2 369	20.6%
Agricultural Research	287	2.5%
Sub-Total for Rural/Agricultural/Tourism Uses	**3 921**	**34.1%**
Open Space/Conservation	3 588	31.2%
Transportation/Remainder	25	0.2%
Total	**11 494**	**100.0%**

The table above indicates that there are significant lands available within SEDis well in excess of the 2026 land demand estimates for residential/settlement (210ha) and community facilities (60ha) and commercial and industrial development (106ha) set out in Table 3-8. The land uses areas are also more than sufficient to accommodate growth estimates up to 2036 as indicated in Table 3-9, including land demand estimates for residential/settlement (470ha) and community facilities (110ha) and commercial and industrial development (191ha). The Land Use and Activity Framework accordingly provides for the phasing of development lands in order to ensure an orderly release of development lands in suitable locations.

5.3.5 Management

The key management interventions necessary to establish a sustainable and integrated land use system are to:

- Identify land parcels to be released for new public and private housing developments and community facilities in suitable, serviceable locations in both the western and eastern settlements.
- Encourage the densification of development along the IRPTN corridors and within activity nodes/spines through appropriate development guidelines/zoning controls and targeted public sector projects.
- Ensure that settlement growth and densification is accompanied and supported by adequate social facilities, necessary utility infrastructure and positive public spaces.

- Require the preparation of guiding masterplans for economic/industrial development clusters/sites to ensure a high quality of layout, design and servicing and to avoid/mitigate landscape and environmental impacts, including along the N3 and Richmond Road.
- Undertake more detailed planning and design for key activity nodes, spines and settlements, including Ambleton, Shenstone, Ashburton and Lynnfield Park.
- Review the Ashburton Town Planning Scheme and servicing arrangements (particularly sanitation) to explore options for the infill and densification of the settlement, establishing an activity node and improving the public realm.
- Incorporate relevant proposals from the land use and activity framework into the future SDF and LUMS.

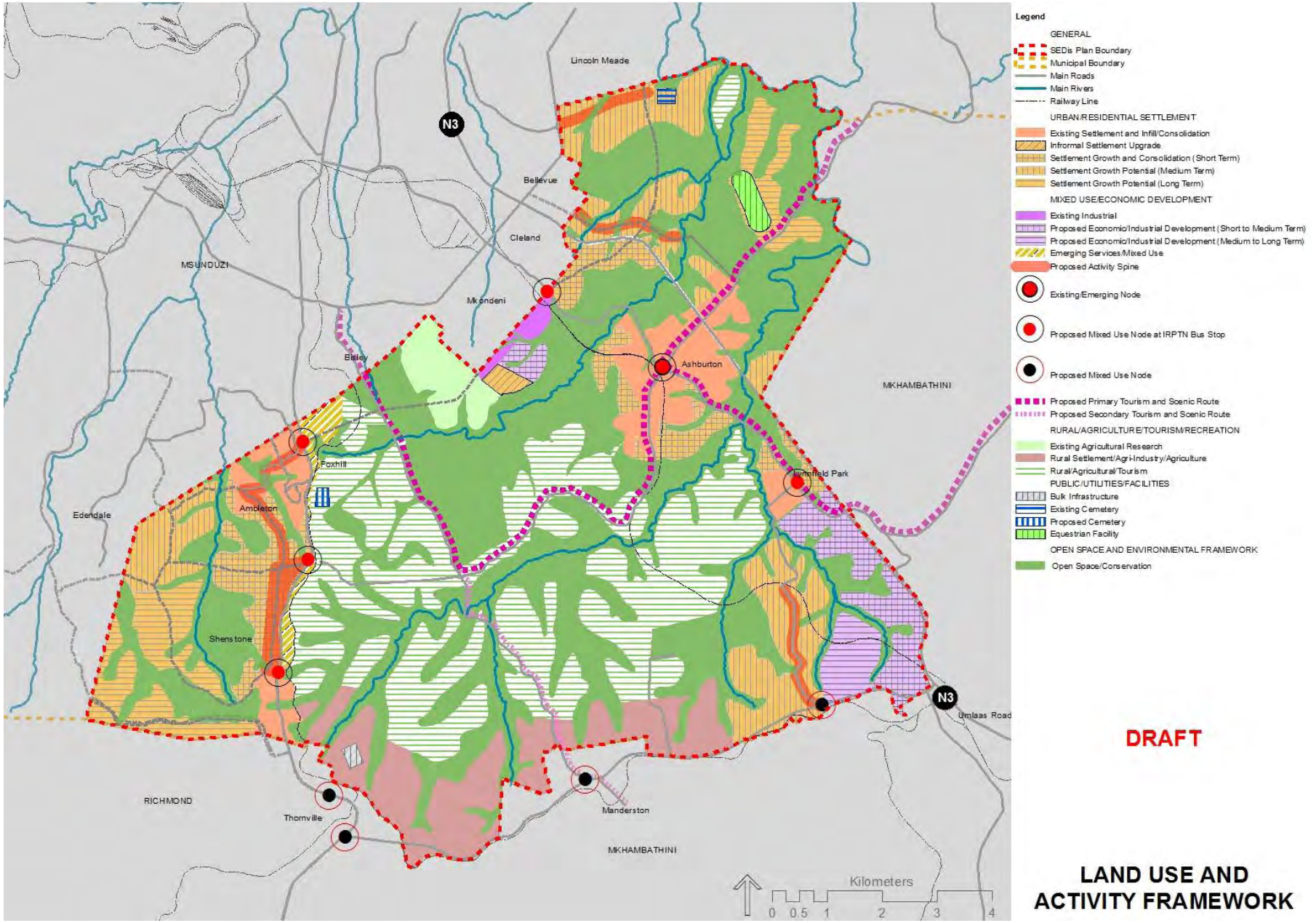


Figure 5-3 : Land Use and Activity Framework

5.4 Public Space, Landscape and Built Form Frameworks

5.4.1 Objective

The objective is to maintain and enhance the distinctive landscape character of the area, to promote the development of appropriate townscape qualities, built forms public spaces and landscaping that respond to and integrate with the landscape and townscape context. The framework seeks to:

- Promote the establishment of a legible, high quality built and natural environment for residents, communities, visitors and investors.
- Promote the protection and/or rehabilitation of the natural river and valley character and landscape of the local area.
- Protect and enhance the special visual qualities of the local area.
- Create public spaces that provide opportunities for social engagement and interaction.
- Promote the protection and establishment of a range of identifiable/discrete settlement characters and townscapes.
- Promote the development of built form that respects and enhances the character of the local area and which creates environments with identity and character.

5.4.2 Concepts

Key concepts underpinning the Public Space, Landscape and Built Forms Frameworks for SEDis are to:

- Respond to and enhance the unique landscape and townscape character along the edge corridors and internal linkages.
- Integrate development with the landscape setting, e.g. ridge lines, valley floors, hill sides, etc., by avoiding visually obtrusive developments, adopting a responsive built form and utilising landscaping to harmonise with the landscape setting and natural vegetation.
- Generate a high quality public realm with focal public spaces, defined streets and a supportive pedestrian environment.
- Create a hierarchy of public spaces – civic, recreational, neighbourhood, community, local, etc.

5.4.3 Elements

The main elements necessary to promote the development of high quality built forms, public spaces and landscaping are as follows:

Landscape/Townscape Qualities

- Retain and enhance the existing landscape/townscape qualities and character areas, such as natural, urban, small holding, agricultural, rivers, ridges, etc.

Landscaped Movement Corridors

- Establish the N3 as a corridor of high landscaping quality with respect to planting/adjacent property landscaping and built form quality. Do not permit mass ribbon industrial/business/office park development.
- Establish the R103, Richmond Road and Dardenelles Road as corridors of high landscape quality with respect to planting/adjacent property landscaping and built form quality.

Areas of High Landscape and Scenic Quality

- Retain the landscape character and qualities of the central area for functional and visual purposes.
- Retain the natural scenic quality of internal linkages and future tourism routes through SEDis, including Bisley Road (P120) and D352.
- Maintain and accentuate views of the Mkhondeni, Mpushini and Slangspruit River valleys and associated landscape features from ridges and edge corridors.

Interface Areas/Buffer Zones

- Areas immediately adjacent to areas of high landscape quality and scenic quality should be subjected to additional development controls that ensure that development is sensitive to the specific quality of the locale in which it falls, e.g.

Mkhondeni and Mpushini River Valleys, Bisley Valley Nature Reserve, Mpushini Protected Areas, etc.

- Create landscaped edges to business and residential estates with high quality building treatments facing major roads.
- Establish open space buffers between non-complementary uses.

Gateway Zones

- Promote the establishment of appropriately scaled gateway features (i.e. landmark buildings and/or infrastructure elements and landscape features) at the entrances to Ashburton, Lynnfield Park, Ambleton and Shenstone and the major economic area at Umlaas Road.

Urban, Suburban and Rural Settlement

- Utilise settlement layout, built form, density and landscaping to promote the establishment of discrete and identifiable neighbourhoods and precincts.
- Develop an urban structure and townscape character for the existing and new settlement areas along the R103 and Richmond Road edge corridors.
- Establish mixed use green lungs along minor river lines.
- Establish feature planting of all mixed use nodes and economic areas.
- Encourage low impact, clustered built form in rural/agricultural/tourism developments.
- Establish/maintain landscape plans for industrial precincts in Umlaas Road, Richmond Road and Mkhondeni.

Nodes, Spines and Public Spaces

- Create focal public spaces in the mixed use nodes, along activity spines and at key intersections.
- Spatially define and landscape activity nodes and spines through the use of appropriate built form and planting, including continuous built edges to create street/public space enclosure, active building edges, landscaped avenues, etc.
- Improve the public realm and pedestrian environment in the activity nodes and along activity spines.
- Create local/neighbourhood focal points at key intersections on the ridges in Ambleton/Shenstone with clustered community facilities, local shop/s, etc.

Landmark Features

- Significant highpoints and ridgelines (skylines) should be sensitively treated according to their context in terms of the overall local area, the sub-area they fall in or the neighbourhood/precinct in which they are located. These points should be enhanced either, through appropriate built form, or through the preservation of important and high quality natural features.

Section 6.4 provides additional guidelines in relation to public spaces, landscaping and built form in residential areas, mixed use nodes and business parks.

5.4.4 MANAGEMENT

Key management interventions necessary to promote the development of a high quality built environment and landscaping are to:

- Undertake public realm improvements in key nodes and settlements.
- Consider the preparation of precinct plans and/or urban design frameworks for mixed use spine/nodes and new settlement areas.
- Review the SDF and prepare LUMS to secure urban design and landscaping objectives for different parts of the SEDis area.

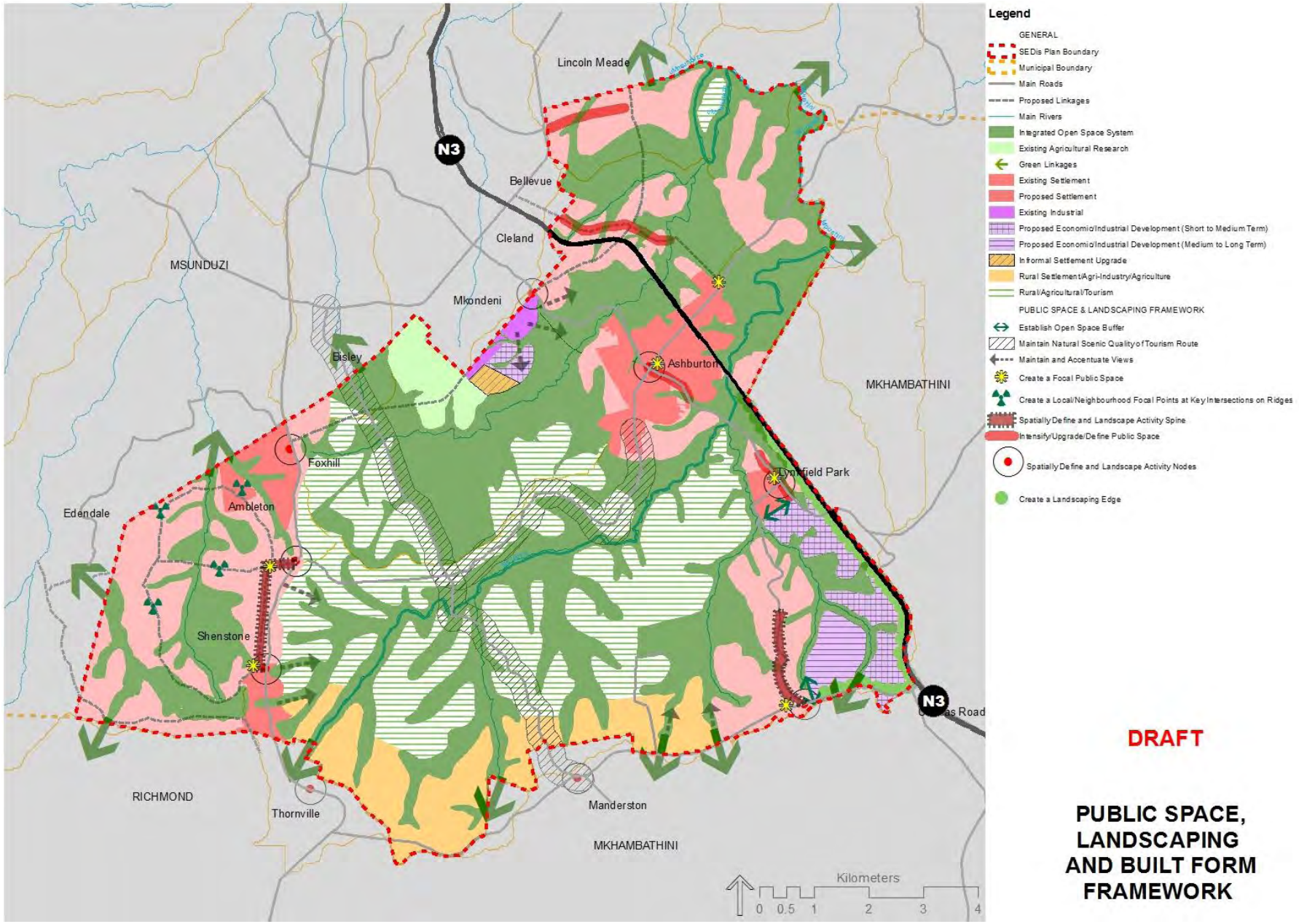


Figure 5-4 : Public Space, Landscaping and Built Form Framework

5.5 Infrastructure and Services Framework

5.5.1 Objective

Encourage and facilitate the provision of an appropriate level of supporting infrastructure to service existing and future development and which protects environmental resources and employs more sustainable approaches to infrastructure provision.

- Meets basic needs in terms of water, sanitation and electricity.
- Protects human health and the environmental assets and quality of the area.
- Supports the social and economic development of the area.
- Responds to the need for approaches to infrastructure provision that promote sustainability and resilience.

5.5.2 Concepts

Key concepts underpinning the Infrastructure and Services Framework for SEDis are to:

- Respond to social and economic needs for infrastructure and services.
- Utilise infrastructure provision to generate improved opportunities for social and economic development.
- Integrate the provision of infrastructure to achieve the vision and priorities for the area.
- Adopt more sustainable approaches to infrastructure and service provision in relation to energy, waste disposal, surface water drainage, etc.

5.5.3 Elements

The main elements necessary to establish a sustainable infrastructure system are as follows:

Sustainable Infrastructure

- Encourage the use of more sustainable approaches to infrastructure provision for new developments, including Sustainable Drainage Systems (SuDS), renewable energy technologies (e.g. solar panels) and rainwater harvesting (i.e. rainwater tanks).
- Retain the ecological integrity of the open space system to provide a green infrastructure network that can assist with surface water management, flood risk attenuation and waste assimilation to reduce the need for hard infrastructure.
- Ensure greater co-ordination in the delivery of different types of infrastructure to maximise social and economic benefits and avoid adverse environmental impacts.
- Liaise with relevant developers, landowners and other stakeholders to identify common solutions to servicing new development and avoid ad hoc, individual solutions that are not cost effective or sustainable.

Water Supply

- The existing water supply infrastructure traversing the SEDis area, including the 61 Pipeline and its offtakes, has the potential to meet water service needs within the SEDis area provided that this is planned well in advance and communicated to the bulk water supplier, Umgeni Water, so that the provision of any needed additional capacity can be duly programmed and implemented.
- Maintain existing water supply infrastructure systems, including water reservoirs, pump stations and water pipelines, and upgrade and extend water supply infrastructure to support new developments and settlement growth in the eastern and western settlements.
- Undertake improvements to water supply infrastructure in a co-ordinated and phased manner to support settlement growth and economic development, focused in the three main catchments of Mkhondeni (servicing Ashburton, Mkhondeni and Hilcove Hills areas), Mpushini (servicing Ashburton, Lynnfield Park and Umlaas Road) and Slangspruit (servicing Ambleton and Shenstone).
- Reserve existing and proposed major water pipeline corridors traversing the SEDis area, including the 61 Pipeline and existing takeoffs serving Ashburton/Lynnfield Park, Ambleton/Foxhill and Manderston/Thornville.

Ambleton/Shenstone

- Piped water supply is currently provided via the Ambleton offtake from Pipeline 61 and the Ambleton reservoir.
- The water supply infrastructure and capacity will need to be augmented to service the development of the Ambleton/Shenstone area.
- Co-ordinate with Umgeni Water regarding bulk water capacity and servicing from the planned bulk water pipeline to Richmond, which traverses the Ambleton/Shenstone area.
- Consider providing water supply from existing and upgraded reservoirs, including the Shenstone Reservoir, Slangspruit and Thornville Reservoirs.
- Upgrade the water supply infrastructure between the source and points of supply, including provision of adequate water storage facilities for balancing and emergency purposes, usually requiring 48 hours of storage at average daily demand.

Ashburton/Lynnfield Park/Umlaas Road

- Piped water is currently provided via the Ashburton offtake from Pipeline 61 and serves Ashburton and Lynnfield Park and the bulk infrastructure has some capacity to meet projected demand.
- Upgrade the water supply infrastructure to provide adequate emergency storage requirements of 48 hours supply at Average Annual Daily Demand in order to meet regulatory requirements.
- Provide a second offtake pipeline from the 61 Pipeline to service future settlement growth around Ashburton and Lynnfield Park and industrial development at Umlaas Road.

Hilcove Hills

- The estimated average daily water demand for the proposed Hilcove Hills development is 1.9Ml per day, which is proposed to be served from the Msunduzi municipal network via the Bisley and Bellevue (Masons) reservoirs.
- Ensure that there is a continued availability of spare capacity on the supply route to these reservoirs, which is shared with the western end of CBD and nearby areas of the city, to provide adequate capacity to serve future development in this area.

Sanitation

- Upgrade and extend the sanitation infrastructure network to support new development and settlement growth in the eastern and western settlements.
- Undertake improvements to sanitation infrastructure in a co-ordinated and phased manner to support settlement growth and economic development, focused in the three main catchments of Mkhondeni (servicing Ashburton, Mkhondeni and Hilcove Hills areas), Mpushini (servicing Ashburton, Lynnfield Park and Umlaas Road) and Slangspruit (servicing Ambleton and Shenstone).
- The use of private wastewater treatment systems to service developments should generally be avoided. The municipality may consider such an approach where it can be demonstrated to the satisfaction of the municipality that the proposed development achieves significant social and/or economic objectives for the area, that the proposed system will meet required standards, that adequate monitoring and maintenance will be provided and that the system will be connected to any future public system provided.
- Monitor the water quality in each of the river catchments and identify and address water pollution sources to retain and improve the water quality status of rivers.
- Monitor the treated wastewater discharges from existing and future WWTWs to ensure that applicable standards are maintained.

Ambleton/Shenstone

- Review the current on-site sanitation utilised in Ambleton/Shenstone and plan for the future provision of waterborne sewerage systems to service future settlement growth in this area.
- Support the ongoing extension of the Slangspruit sewer in the direction of Shenstone, Ambleton and Foxhill to service the development of these areas.

- Investigate options for future waterborne sewerage systems to serve urban/residential settlements and economic/mixed use development areas along the Richmond Road corridor, including possible location for a new WWTW downstream of the Ambleton/Shenstone residential settlements.

Ashburton/Lynnfield Park/Umlaas Road

- Review the current on-site sanitation utilised in Ashburton and plan for the future provision of a full waterborne sewerage network and outfall construction to service the consolidation and growth of this settlement.
- Undertake a study to establish the preferred design and configuration of the sewer reticulation and the location, selection and design of wastewater treatment technology for Ashburton.
- Until such time as a waterborne sewerage system is provided in Ashburton, restrict the subdivision of sites to less than 4,000m^2 unless the site has passed percolation test requirements and, where appropriate, require the use of conservancy tanks with adequate maintenance arrangements.
- Review the system of sewer reticulation, sewage pumping, wastewater treatment and disposal of solid and liquid effluents in Lynnfield Park.
- Upgrade the capacity of the Lynnfield Park and Darvill WWTWs to serve the development of the area.
- Investigate options for future waterborne sewerage systems to serve urban/residential growth areas and economic/industrial development areas along the R103/N3 corridors, including possible locations for new WWTWs downstream of the Umlaas Road economic/industrial areas and/or Lynnfield Park/Ashburton residential settlements.
- Consider the provision of additional wastewater facilities, including a WWTW downstream of the Ashburton settlement to serve Ashburton, Lynnfield Park and Umlaas Road via a gravity sewer.

Hilcove Hills

- The proposed development will require an initial capacity of 1.9Ml/day, and a potential future capacity of 6Ml/day, which is proposed to be served via a new WWTW on the Hilcove Hills site at a low point of the development near the north eastern boundary.
- Ensure that the planning for the servicing of the proposed Hilcove Hills development incorporates adequate provision for the connection of other developments and upstream settlements and economic development areas. This includes provision for adequate WWTW capacity, pipe sizes and servitudes.

Surface Water Drainage

- Promote the use of sustainable drainage systems in new developments and retrofit existing developments where feasible and appropriate.
- Strengthen the resilience of the open space system and its role in managing surface water drainage and avoiding/reducing flooding.
- Ensure that surface water runoff rates from new developments do not exceed the runoff rate of the site in its greenfield state.

Electricity

- The existing electricity infrastructure network in SEDis includes the Ariadne sub-station (400 to 132kV sub-station) in SEDis and a 132kV network, together with a number of other sub-stations around the SEDis area.
- There is no spare electricity network capacity in east/southeast SEDis and limited spare capacity in south and west SEDis and the infrastructure network will accordingly need to be upgraded and new electricity connections will need to be carefully managed.
- The planned upgrading of the Umlaas Road Sub-station and 3 new substations at Ranch (projected 2015), Lynnfield Park (projected 2015/2016) and Oriole (post 2016) by Eskom will boost capacity for servicing the eastern SEDis areas.
- The northern and western SEDis areas have the potential to be serviced via extensions from the Edendale network (with supplies from Unit P and Azalia Sub-station), some connections from the 32kV Thornville line and a possible new connection from Ariadne Sub-station.

- Co-ordinate with Eskom in the roll out of electricity infrastructure improvements to serve settlement growth and economic development needs within the SEDis and broader area.
- Promote and support renewable energy initiatives in new developments and retrofits of existing development, such as solar panels for public housing projects, to help manage/reduce electricity demand and improve sustainability.
- Reserve sufficient lands around the Ariadne Sub-station for the future expansion of this facility to serve demand within SEDis and the broader area.
- Reserve corridors and buffers along major electricity power line servitudes and avoid encroachment of inappropriate development.

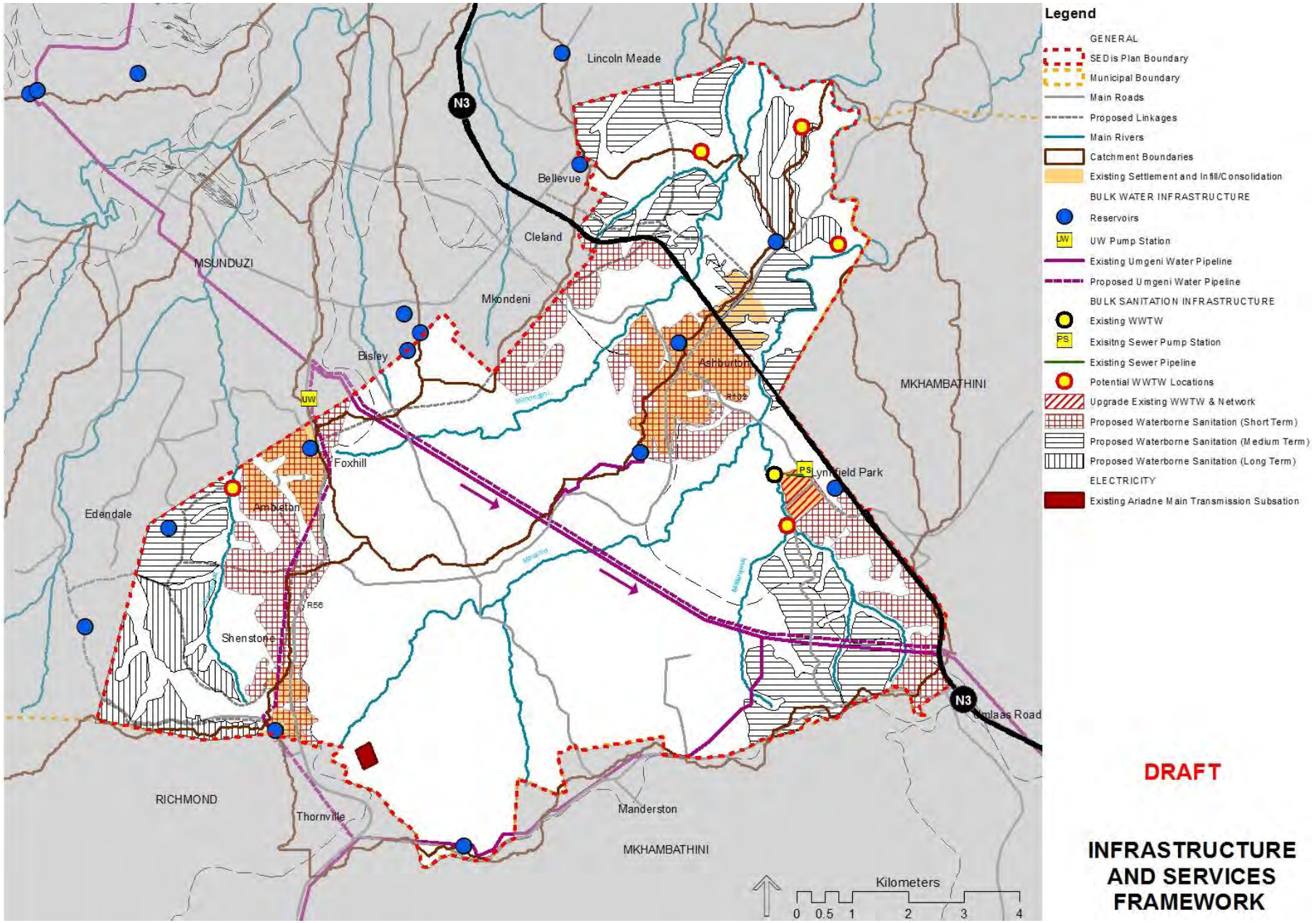


Figure 5-5 : Infrastructure and Services Framework

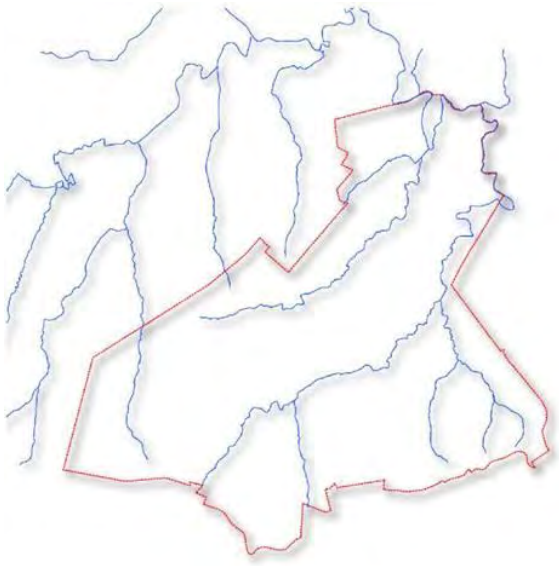
6 PRECINCT GUIDELINES

6.1 PRECINCT STRUCTURE

A number of sub-areas, or precincts, have been identified within the SEDis area that respond to:

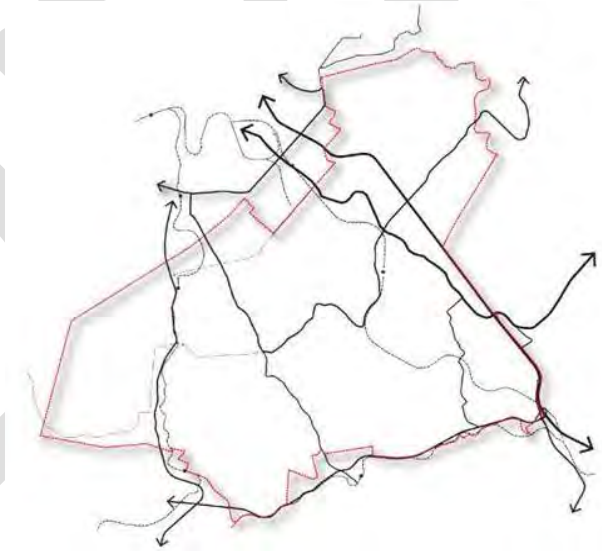
- The spatial development concept for SEDis of edge development corridors surrounding a central productive core.
- The functional connectivity and/or similar landscape character of each sub-area.
- The spatial definition created by river systems, major transport routes and cadastral boundaries (see Figure 6-1).

The precincts provide a more fine-grained basis for identifying and integrating specific land use, movement, open space, landscaping, built form, etc. proposals for each sub-area.



Rivers

River Catchments



Road and Rail

Cadastral

Figure 6-1 : Precinct Delineation Informants

A total of six precincts have been identified, the first five are associated with the edge corridors and the sixth precinct contains the central area of SEDis (refer to Figure 6-2 and Table 6-1):

- **Precinct 1** – Northeast Precinct
- **Precinct 2** – R103/N3 Precinct
- **Precinct 3** – Dardenelles Road Precinct
- **Precinct 4** – Richmond Road Precinct
- **Precinct 5** – Mkhondeni Precinct
- **Precinct 6** – Central Precinct

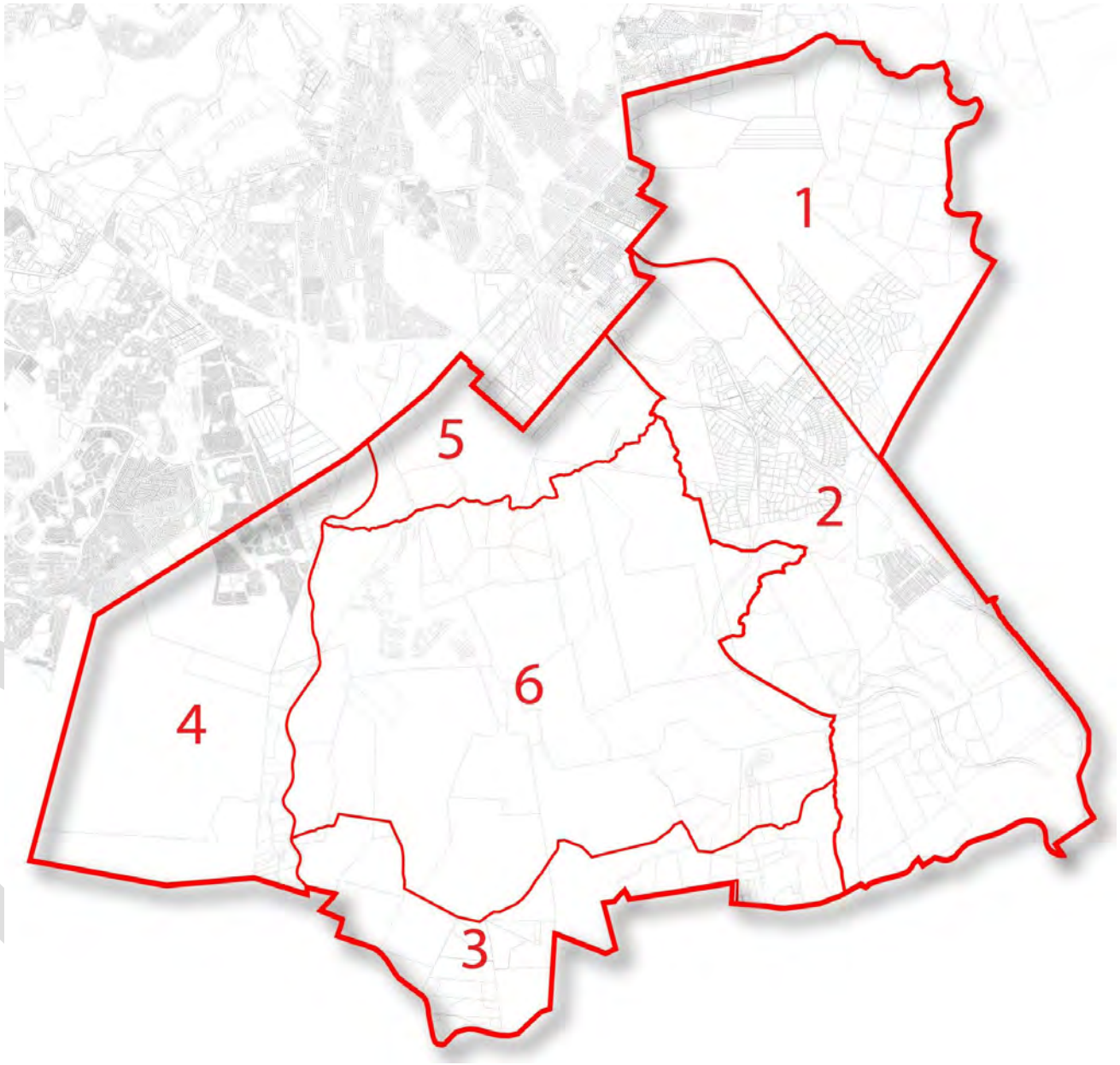


Figure 6-2 : SEDis Precincts

Table 6-1 : SEDis Precincts

PRECINCT	NAME	DESCRIPTION	AREA
Precinct 1	**Northeast Precinct**	• Organised along eastern edge of N3 corridor and P478 route and includes area proposed for Hilcove Hills development • Bounded by N3 in west, SEDis boundary in north, east and south and Msunduzi River in northeast • Inwardly connected to Precinct 2 • Outwardly connected to Msunduzi (Bellevue/Lincoln Meade), Msunduzi River and Mkhambathini	1 871ha
Precinct 2	**R103/N3 Precinct**	• Organised along R103 corridor and western edge of N3 corridor and includes settlements of Ashburton and Lynnfield Park • Bounded by N3 to east, rivers/rail line/cadastral to west, SEDis boundary to north and Dardenelles Road/SEDis boundary to south • Inwardly connected to Precincts 1, 3, 5 and 6 • Outwardly connected to Msunduzi (Cleland, Mkhondeni) and Mkhambatini (Camperdown)	2 684ha
Precinct 3	**Dardenelles Road Precinct**	• Organised along Dardenelles Road • Bounded by Dardenelles Road and SEDis boundary to south and rivers/streams/cadastral to north • Inwardly connected to Precincts 2, 4 and 6 • Outwardly connected to Mkhambathini (Manderston) and Richmond (Thornville)	1 030ha
Precinct 4	**Richmond Road Precinct**	• Organised along Richmond Road and includes settlements of Ambleton, Shenstone and Fox Hill • Bounded by rail line to east and SEDis boundaries to west, north and south • Inwardly connected to Precincts 3, 5 and 6 • Outwardly connected to Msunduzi (Edendale/Imbali/Slangspruit) and Richmond (Thornville/Richmond Road)	1 696ha
Precinct 5	**Mkhondeni Precinct**	• Organised along Shortts Retreat Road and includes portions of Mkhondeni, Ukulinga Research Farm and Bisley Valley Nature Reserve • Bounded by Mkhondeni River to south, SEDis boundary to north and rail lines to east and west • Inwardly connected to Precincts 2, 4 and 6 • Outwardly connected to Msunduzi (Oribi Airport, Bisley Valley Nature Reserve)	627ha
Precinct 6	**Central Precinct**	• Organised along Mpushini River • Bounded by Mkhondeni River to north, rivers/streams/rail line/cadastral to east, rivers/streams/cadastral to south and rail line to west • Inwardly connected to Precincts 2, 3, 4 and 5 • Enclosed by other precincts but connected to Msunduzi River via Mkhondeni and Mpushini River corridors	3 587ha
TOTAL	**SEDis**		**11 494ha**

6.2 PRECINCT GUIDELINES

Each precinct has its own character, development challenges and potential and requires guidelines tailored to the needs of each precinct. Roles have been identified for each precinct based on their inherent qualities and characteristics to support and accommodate a specific form of human settlement and activity, and to either protect and/or enhance the environment. These roles relate to the function that each will play in the district and the municipality and describe the contribution they make to the overall planning and development objectives of the Municipality as described in the Municipal IDP and its component plans.

The planning and management of these precincts should be aimed at turning these functional areas into local activity systems that provide a range of facilities, economic opportunities and services required by local residents. The role, key characteristics, spatial development concepts and key responses are outlined for each of these functional precincts in the tables below.

These Precinct Guidelines do not prescribe the detailed layout and land use mix of any new growth areas. Development in these areas must be preceded by more detailed planning, such as a precinct plan, that should indicate the proposed land use distribution and mix, zoning and development controls, residential densities, landscaping, built form directives, transport and infrastructure services, and development phasing.

6.2.1 PRECINCT 1 : NORTHEAST PRECINCT

PRECINCT ROLE	**Sustainable urban residential/mixed use expansion area from Ashburton North, Bellevue AND Lincoln Meade into the northeast precinct area with a support system of facilities, services, infrastructure, open spaces, etc.**
Ecological Role	• Protection of national, regional and local environmental assets associated with Msunduzi, Mkhondeni and Mpushini River systems and catchments. • Regionally significant open space assets with high ecological importance. • Type, extent and intensity of future development should not exacerbate existing environmental impacts.
Economic Role	• Economic potential due to the presence of the N3 corridor, the access to growing residential thresholds (in Ashburton North and Hilcove Hills area) and the availability of developable land along the ridges between the valley lines. • Local commercial/office development spine/node with regional potential subject to high level of access, services and demand.
Social Role	• Local sustainable urban settlement expansion area from Bellevue and Ashburton with support facilities, services and infrastructure. • Availability of undeveloped land and low density settlement create an opportunity for residential expansion with support facilities, services and infrastructure.
PRECINCT STRUCTURE	**Precinct is bounded along its western edge by the N3 and the primary access is provided by the P478. Precinct is in the process of transforming from a low density peri-urban area to a more suburban residential area.**
Land Form, Drainage and Natural Assets	• Land Form – ridgeline running between the Mkhondeni and Mpushini river systems • Drainage Systems – Msunduzi, Mkhondeni and Mpushini River systems provide main river and valley systems within precinct and fragment land available for development • Mpushini Protected Area – properties along eastern precinct boundary • Grasslands
Land Uses	• Formal Residential – Ashburton North and Bellevue

	• Amenities – Ashburton Race Course and Training Centre • Facilities – Ethembeni Cemetery • Undeveloped Lands
Transport and Infrastructure	• N3 Corridor – provides main corridor, creates a hard edge/barrier along western edge of precinct and traverses the Mkhondeni and Mpushini River valleys • P478 – provides primary access to the precinct from N3 interchange and Ashburton
LAND USE SYSTEM RESPONSES	**Extend existing Ashburton North and Bellevue area and develop new urban settlements with a clear urban structure, high quality built and natural environment and adequate service levels, accessibility, social infrastructure and access to employment opportunities.**
Ashburton North Settlement	• Promote the consolidation and expansion of the Ashburton North settlement with support facilities, services and infrastructure to create an integrated and sustainable urban neighbourhood. • Encourage the development of a local mixed use urban node within Ashburton North along the P478 with local shops, community facilities, public open spaces, higher density residential, etc. • Promote the sustainable urban expansion of existing residential settlements with a mix of incomes, densities and housing options.
Bellevue and Lincoln Meade Settlements	• Promote the consolidation and expansion of the Bellevue and Lincoln Meade settlements into the Northeast Precinct to create integrated and sustainable urban neighbourhoods with mixed incomes, densities and housing options together with support facilities, services and infrastructure. • Encourage the development of a new road/street network to service settlement expansion into the Northeast Precinct, including an activity spine with more intensive development, community facilities, etc.
Hilcove Hills Area	• Promote the development of a mixed use urban settlement area with commercial, offices, residential and complementary uses along a new activity spine running parallel with the N3, connecting Bellevue and Ashburton North/P78 and with access to existing and potential future N3 interchanges.
Community Facilities	• Provide community facilities in local nodes to service new residential developments commensurate with the demographic and land use mix of the sub-area, and in line with applicable standards. • Cluster community facilities in accessible locations, on public transport routes and/or in local nodes.
Tourism and Recreation	• Retain the existing stables and racecourse and promote the development of complementary land uses associated with this facility. • Support the provision and extension of amenity walks within the open space network with low impact recreational facilities at key access points to the amenity network.
Open Space	• Provide active and passive public open spaces to serve new residential development in suitable locations, including at the interface between natural and built areas. • Minimise the fragmentation of development lands caused by the open space system through the provision of pedestrian linkages where appropriate.
MOVEMENT SYSTEM RESPONSES	**Improve the movement and circulation network and services, including the upgrading and extension of the road network, the provision and improvement of public transport services and the pedestrian network and greater integration between land use and transport.**
Access and Road Network	• N3 corridor provides the main corridor and creates a hard edge/barrier along western edge of precinct. • P478 currently provides the primary access to precinct from N3 interchange and Ashburton. • Improve access to the precinct and provide additional linkages to connect and serve existing and future development, including the upgrading of the N3 interchange at Ashburton to increase the capacity of this interchange and improve access to the precinct, the provision of a new road linkage parallel to the N3 corridor linking Bellevue to Ashburton North and a new road linkage traversing the N3 and connecting Hilcove Hills/Bellevue to the R103/Mkhondeni.

Public Transport	• Ensure that the internal road network of sub-area includes provision for public transport routes feeding to the public transport/IRPTN nodes along the R103 corridor.
Pedestrian Network	• All neighbourhoods within the sub-area should be designed to accommodate comfortable and secure pedestrian routes that link to public transport nodes (stops and stations).
Tourism Corridor	• Promote the establishment of a tourism corridor along P478 connecting existing and potential future tourism facilities in Msunduzi, SEDis and Mkhambathini, including Bisley Valley Nature Reserve, game farms and B&Bs, Mpushini Conservancy, the African Bird of Prey Sanctuary, cultural tourism opportunities, etc.
OPEN SPACE SYSTEM RESPONSES	**Protect and upgrade the open space system to structure the development of the area and to provide environmental services to surrounding settlements and developments.**
Mpushini Protected Areas	• Protect the Mpushini protected areas and encourage the linkage of these areas to improve ecological functioning.
Open Space and River Systems	• Protect and upgrade the open space system, including river systems and associated open spaces and biodiversity areas.
Environmental Services	• Improve the management of natural habitats (such as wetlands, grasslands and rivers) to increase these habitats' ability to supply environmental services, such as flood avoidance, water regulation and supply, erosion control, waste treatment and nutrient cycling and food production, to surrounding intensive developments.
PUBLIC SPACE, LANDSCAPE AND BUILT FORM RESPONSES	**Encourage the development of an urban settlement structure with a positive public environment.**
Public Space	• Encourage a more intensive built form within the local node at Ashburton North with defined public spaces/streets and a positive pedestrian environment.
Landscaping	• Create identifiable neighbourhoods within each development block tied together by consistently landscaped linkage roads and pedestrian sidewalks.
Built Form	• Encourage a finer grain of residential development along the existing and potential road linkages with medium densities and buildings located to define the street.
INFRASTRUCTURE RESPONSES	**Encourage the use of more sustainable approaches to infrastructure provision.**
Sustainable Infrastructure	• Encourage the use of more sustainable approaches to infrastructure provision for new developments, including Sustainable Drainage Systems (SuDS), renewable energy technologies (e.g. solar panels) and rainwater harvesting (i.e. rainwater tanks). • Retain the ecological integrity of the open space system to provide a green infrastructure network that can assist with surface water management, flood risk attenuation and waste assimilation to reduce the need for hard infrastructure.
Sanitation	• Investigate the feasibility and potential capacity of a new WWTW in the lower reaches of the Mkhondeni and/or Mpushini River catchments to serve upstream settlements and developments.

6.2.2 PRECINCT 2 : R103/N3 PRECINCT

PRECINCT ROLE	Sustainable urban neighbourhoods along existing R103/upgraded D354 corridor and major industrial/economic node at Umlaas Road.
Ecological Role	• Protection of national, regional and local environmental assets associated with Mkhondeni and Mpushini River systems and catchments. • Regionally significant open space assets with high ecological importance. • Type, extent and intensity of future development should not exacerbate existing environmental impacts.
Economic Role	• Economic potential due to the presence of the N3 corridor, the access to growing residential thresholds (in Ashburton North and Hilcove Hills area) and the availability of developable land along the ridges between the valley lines. • Regional high quality economic/industrial development area extending between N3 interchanges with landscaped avenues and edges, high quality building elevation treatments to N3 and high quality services.
Social Role	• Sustainable urban neighbourhoods along existing R103/upgraded D354 corridor with support facilities, services and infrastructure. • National recreational role with Comrades Marathon along R103/Polly Shortt's road and Amashova cycle route.
PRECINCT STRUCTURE	**Precinct is bounded along its eastern edge by the N3 and is organised along the R103. Precinct is in the process of transforming from a low density peri-urban area to a more suburban residential area.**
Land Form, Drainage and Natural Assets	• Land Form – ridgeline running between the Mkhondeni and Mpushini river systems • Drainage Systems – Mkhondeni and Mpushini Rivers provide main river and valley systems within the precinct that divide precinct into 3 identifiable sub-areas, including Bellevue south, Ashburton and Lynnfield Park/areas to south • Grasslands
Land Uses	• Formal Residential – Ashburton and Lynnfield Park.
Transport and Infrastructure	• N3 Corridor – provides main corridor, creates a hard edge/barrier along eastern edge of precinct and traverses the Mkhondeni and Mpushini River valleys • R103 – provides main spine linking the settlements within the precinct to more central Msunduzi areas • P478 – provides primary access to precinct from N3 interchange and Ashburton. • D354 – local gravel road linking Lynnfield Park to Dardenelles Road. • Rail – Railway line with a rail station at Ashburton.
LAND USE SYSTEM RESPONSES	**Upgrade, consolidate and improve the performance of urban settlement areas in terms of service levels, accessibility, social infrastructure and access to employment opportunities and develop significant economic and industrial investment areas in suitable locations along the N3 corridor.**
Ashburton Formal Settlement	• Promote the consolidation and expansion of Ashburton settlement with support facilities, services and infrastructure to create an integrated and sustainable urban neighbourhood. • Encourage the development of a local mixed use urban node at the intersection of the R103/P478 with local shops, community facilities, public open spaces, bus stop, higher density residential, public transport node, etc. • Retain and provide public open spaces and sportsfields in and around the Ashburton area for the benefit of local communities and as buffer uses between settlement areas and the open space system.
Lynnfield Park Formal Settlement	• Promote the consolidation and expansion of Lynnfield Park settlement with support facilities, services and infrastructure to create an integrated and sustainable urban neighbourhood. • Encourage the development of a local mixed use urban node at the intersection of the R103/D354 with local shops, community facilities, public open spaces, bus stop, higher density residential, public transport node, etc.

D354 Settlement	• Support the development of a new residential settlement along an upgraded D354 with a mix of incomes, densities, housing options and tenure options. • Support the development of a new local mixed use urban node at the intersection of the D354/Dardenelles Road with local shops, community facilities, public open spaces, bus stop, higher density residential, etc.
Cleland South Formal Settlement	• Promote the consolidation and southward expansion of the Cleland settlement with support facilities, services and infrastructure to create an integrated and sustainable urban neighbourhood.
Umlaas Road Industrial/ Business Park	• Promote the development of a well-managed and serviced economic/industrial development estate extending between the N3 interchanges (Umlaas Road and Lynnfield Park) with high levels of access and servicing, a high quality built and natural environment, etc.
Productive and Tourism Uses	• Encourage the retention and development of productive and tourism uses west of existing settlements, including both commercial and communal agriculture.
Open Spaces	• Protection of the open spaces associated with the Mkhondeni and Mpushini River systems.
MOVEMENT SYSTEM RESPONSES	**Improve the movement and circulation network and services, including the upgrading and extension of the road network, the provision and improvement of public transport services and the pedestrian network and greater integration between land use and transport.**
R103 Public Transport Corridor	• Support the establishment of a public transport corridor along R103 comprised of the IRPTN bus feeder route with bus stops at key nodes.
Pedestrian Network	• All neighbourhoods within the sub-area should be designed to accommodate comfortable and secure pedestrian routes that link to public transport nodes (stops and stations).
N3 Mobility Corridor	• Upgrade interchanges along the N3 corridor at Umlaas Road, Lynnfield Park and Ashburton to serve the capacity/operation needs of the N3 corridor and improve access to the eastern settlements.
D354 Activity Spine	• Upgrade the D354 to provide a future activity spine serving adjoining residential and mixed use development between Lynnfield Park and Dardenelles Road.
Road Linkages	• Develop a new road linkage between Mkhondeni/R103 and Bellevue. • Develop a new road linkage connecting D352 to D354 and Lynnfield Park settlement. • Investigate the provision of an alternative road alignment for the P478 north of the P478/R103 intersection to remove through traffic from the future Ashburton local node and allow for street front development, public realm and pedestrian improvements.
OPEN SPACE SYSTEM RESPONSES	**Protect and upgrade the open space system to structure the development of the area and to provide environmental services to surrounding settlements and developments.**
Open Space System	• Protect and upgrade the open space system, including the Mkhondeni and Mpushini River systems and associated open spaces, biodiversity areas and environmental assets.
Environmental Services	• Improve the management of natural habitats (such as wetlands, grasslands and rivers) to increase these habitats' ability to supply environmental services, such as flood avoidance, water regulation and supply, erosion control, waste treatment and nutrient cycling and food production, to surrounding intensive developments.
PUBLIC SPACE, LANDSCAPE AND BUILT FORM RESPONSES	**Encourage the development of a series of well-structured urban neighbourhoods along the R103/structure with a positive public environment.**
Mixed Use Nodes	• Create identifiable character for each settlement area at Bellevue south, Ashburton, Lynnfield Park and a new residential area extending from Lynnfield Park to Dardenelles Road.
Activity Spine	• Establish an activity spine along the D354 linking the Lynnfield Park and Dardenelles Road nodes. • Encourage a finer grain of residential development along the existing and potential road linkages with medium densities and buildings located to define the street.

Landscape	• Mpushini and Mkhondeni Rail Viaducts.
Residential Areas	• Encourage a more intensive built form within the mixed use nodes at Ashburton, Lynnfield Park and future node on Dardenelles Road with defined public spaces/streets and a positive pedestrian environment.
INFRASTRUCTURE RESPONSES	**Encourage the use of more sustainable approaches to infrastructure provision.**
Sustainable Infrastructure	• Encourage the use of more sustainable approaches to infrastructure provision for new developments, including Sustainable Drainage Systems (SuDS), renewable energy technologies (e.g. solar panels) and rainwater harvesting (i.e. rainwater tanks). • Retain the ecological integrity of the open space system to provide a green infrastructure network that can assist with surface water management, flood risk attenuation and waste assimilation to reduce the need for hard infrastructure.
Sanitation	• Upgrade the capacity of the Lynnfield Park WWTW to service existing and proposed development in Lynnfield Park and potentially the southern portion of Ashburton. • Investigate the options for servicing the economic/industrial development and settlement area with waterborne sewerage at an upgraded Lynnfield Park WWTW or a new WWTW within the Upper Mpushini River catchment.

6.2.3 PRECINCT 3 : DARDENELLES ROAD PRECINCT

PRECINCT ROLE	**Rural/agricultural corridor along Dardenelles Road with agricultural, agri-industrial and lower intensity rural residential uses.**
Ecological Role	• Protection of local environmental assets associated with headwaters of Mpushini River system and catchment.
Economic Role	• Local sustainable rural settlement and important regional node at intersection of Dardenelles/Richmond Roads with agri-industry/processing and agricultural area along Dardenelles Road corridor with appropriate support services and infrastructure.
Social Role	• Local sustainable rural settlement areas arranged in nodes and clusters with appropriate support services and infrastructure.
PRECINCT STRUCTURE	**Precinct is organised along Dardenelles Road corridor, which follows the ridgeline between the Mpushini River catchment and the catchments to the south of Msunduzi.**
Land Form, Drainage and Natural Assets	• Land Form – catchment boundary runs along the southern precinct edge/Dardenelles Road and provides intermittent views over Mpushini River valley • Drainage Systems – Mpushini River, tributaries (including Malkopspruit/The Donga to the east) and valley systems within precinct
Land Uses	• Settlements – Manderston and Thornville settlements/nodes along Dardenelles Road south of the precinct.
Transport and Infrastructure	• P338 (Dardenelles Road) Corridor – main east-west movement route in the precinct providing linkage from Richmond Road to N3 and access to adjoining lands; runs along ridge and forms southern edge to precinct. • P120 (Bisley Road) – provides north-south linkage route from Dardenelles Road to Bisley Valley. • D685 – local *cul-de-sac* road providing access to amenities, tourism facilities, etc.
LAND USE SYSTEM RESPONSES	**Sustainable rural settlement, agri-industry/processing and agriculture along Dardenelles Road corridor with appropriate support facilities, services and infrastructure.**
Manderston Settlement	• Support the consolidation and sustainable growth of the existing Manderston settlement. • Reinforce the emerging mixed use rural node at Manderston with compatible low impact rural, service and agricultural development within the precinct area.
Thornville Settlement	• Support the consolidation and sustainable growth of the existing Thornville settlement. • Reinforce the emerging mixed use rural node at Thornville with compatible low impact rural, service and agricultural development within the precinct area.
Productive	• Productive uses north of road corridor, including commercial and communal agriculture.
Open Spaces	• Protect the open spaces associated with the Mpushini River system.
MOVEMENT SYSTEM RESPONSES	**Retain and strengthen the role of Dardenelles Road (P338) as the primary mobility and access route in the precinct.**
P338 Public Transport Corridor	• Potential future public transport corridor along Dardenelles Road with bus stops at key nodes providing linkages between western settlements and eastern economic opportunity areas and connecting IRPTN bus feeder routes along Richmond Road and R103.
Pedestrian Network	• Mixed use nodes should be designed to accommodate comfortable and secure pedestrian routes that link to future public transport nodes (stops and ranks).
Road Linkages	• Improve existing road linkages to Central Precinct and Bisley Valley.
OPEN SPACE SYSTEM RESPONSES	**Protect and upgrade the open space system to structure the development of the area and to provide environmental services to surrounding settlements and developments.**
Open Space System	• Protect and upgrade the open space system, including the Mpushini River and tributary systems and associated open spaces, biodiversity areas and environmental assets.

Environmental Services	• Improve the management of natural habitats (such as wetlands, grasslands and rivers) to increase these habitats' ability to supply environmental services, such as flood avoidance, water regulation and supply, erosion control, waste treatment, nutrient cycling and food production, to surrounding developments.
PUBLIC SPACE, LANDSCAPE AND BUILT FORM RESPONSES	**Encourage the development of an agricultural/rural settlement structure with a positive public environment in key mixed use rural nodes.**
Mixed Use Nodes	• Support the development of more intensive built form within the emerging nodes at Manderston and Thornville.
Residential Areas	• Encourage the clustering of rural settlement and buildings to avoid sprawl and create places with form and identity in the landscape.
INFRASTRUCTURE RESPONSES	**Encourage the use of more sustainable approaches to infrastructure provision.**
Sustainable Infrastructure	• Encourage the use of more sustainable approaches to infrastructure provision for new developments, including Sustainable Drainage Systems (SuDS), renewable energy technologies (e.g. solar panels) and rainwater harvesting (i.e. rainwater tanks). • Retain the ecological integrity of the open space system to provide a green infrastructure network that can assist with surface water management, flood risk attenuation and waste assimilation to reduce the need for hard infrastructure.
Electricity	• Retain sufficient lands around the Ariadne electricity station to accommodate future expansion of this major energy facility.

6.2.4 PRECINCT 4 : RICHMOND ROAD PRECINCT

PRECINCT ROLE	**Sustainable urban residential/mixed use expansion area from Edendale/Imbali into Ambleton and Shenstone with support system of facilities, services, infrastructure, open spaces, etc.**
Ecological Role	• Protection of local environmental assets associated with Slangspruit River system and catchment. • Local environmental role with smaller river systems (Slangspruit River), catchment areas and associated open space assets. • Relatively small size of open space assets and high levels of disturbance to natural resources due to relatively intensive settlement limits ecological importance. • Type, extent and intensity of future development should not exacerbate existing environmental impacts.
Economic Role	• Local and sub-regional mixed use/ economic development along Richmond Road corridor and within activity nodes. • Economic potential due to the presence of the Richmond Road corridor, the access to growing residential thresholds (in Ambleton and Shenstone) and the availability of developable land (along and to the west of Richmond Road). • There is potential for this to develop into an important local activity spine within the precinct.
Social Role	• Local sustainable urban settlement expansion area from Edendale/Imbali into Ambleton and Shenstone with support facilities, services and infrastructure. • High demand for settlement growth and associated development due to proximity to the expanding Edendale area, access to movement routes and linkages with opportunities and facilities in the more central/CBD areas. • Availability of undeveloped land and low density settlement create an opportunity for residential expansion with support facilities, services and infrastructure.
PRECINCT STRUCTURE	**Precinct is in the process of transforming from a low density peri-urban area to a more suburban residential area.**
Land Form, Drainage and Natural Assets	• Land Form – eastern edge of precinct located along watershed/ridgeline running north-south between the Slangspruit catchment to the west and the Mkhondeni/Mpushini catchments to the east. • Drainage System – Slangspruit River is the main river and valley system within the precinct. • Grasslands
Land Uses	• Formal Residential – Ambleton • Informal Residential – Shenstone • Services – Richmond Road
Transport and Infrastructure	• P5 (Richmond Road) – runs along the ridge between the Slangspruit catchment and the Mkhondeni/Mpushini catchments and provides the main mobility and access corridor through the precinct • Railway Line – forms eastern boundary of the precinct and creates an important landscape feature and barrier to development along the eastern edge of Richmond Road • Rail Station – Foxhill Station
LAND USE SYSTEM RESPONSES	**Upgrade, consolidate and improve the performance of urban settlement areas in terms of service levels, accessibility, social infrastructure and access to employment opportunities.**
Ambleton Formal Settlements	• Improve the public environment of the formal residential areas of Ambleton. • Establish a higher order new mixed use node along Richmond Road with a local market, commercial activities, services, major community facilities, bus stop facility and higher density residential development. • Establish an activity spine as a parallel system to Richmond Road with mixed use and more intensive residential development linking the

	Ambleton, Foxhill and Shenstone nodes. • Provide recreational amenities using existing grasslands.
Shenstone Informal Settlements	• Upgrade services and infrastructure in informal residential areas and link informal settlements into movement systems within formal residential areas. Provide recreational amenities using existing grasslands and other open space assets. • Establish a local mixed use node along Richmond Road.
Foxhill Formal Settlement	• Improve the public environment of the formal residential areas of Foxhill. • Establish a local mixed use node along Richmond Road.
Richmond Road Service Area	• Consolidate existing service activities along the eastern edge of Richmond Road and encourage the development of mixed uses, services and agri-industry between Richmond Road and the rail line. • Ensure that future service developments do not adversely affect water quality and quantity by controlling effluent produced and stormwater runoff generated by new developments.
Productive Use Area	• Encourage productive uses east of the rail line, including small scale, subsistence and communal agriculture. • Promote food growing and job creation for nearby communities in Ambleton and Shenstone.
Open Spaces	• Protect the open spaces associated with the Slangspruit, Mkhondeni and Mpushini River systems.
MOVEMENT SYSTEM RESPONSES	**Improve the movement and circulation network and services, including the upgrading and extension of the road network, the provision and improvement of public transport services and the pedestrian network and greater integration between land use and transport.**
P5 Public Transport Corridors	• Create a public transport corridor along the new spine linking the Ambleton, Foxhill and Shenstone nodes (including proposed Bus Route 7/IRPTN bus feeder route with bus stops at key nodes). • Richmond Road to provide for regional traffic movements and long distance/express bus services with bus stops at key nodes.
Pedestrian Network	• All neighbourhoods within the sub-area should be designed to accommodate comfortable and secure pedestrian routes that link to public transport nodes (stops and stations).
Activity Spine	• Establish an activity spine on a parallel system to Richmond Road linking the Ambleton, Foxhill and Shenstone nodes.
Road Linkages	• Establish new/improved road linkages to the Mkhondeni industrial area, Edendale area and Central Precinct.
OPEN SPACE SYSTEM RESPONSES	**Protect and upgrade the open space system to structure the development of the area and to provide environmental services to surrounding settlements and developments.**
Open Space System	• Protect and upgrade the open space system, including river systems and associated open spaces and biodiversity areas.
Environmental Services	• Improve the management of natural habitats (such as wetlands, grasslands and rivers) to increase these habitats' ability to supply environmental services, such as flood avoidance, water regulation and supply, erosion control, waste treatment and nutrient cycling and food production, to surrounding intensive developments.
PUBLIC SPACE, LANDSCAPE AND BUILT FORM RESPONSES	**Encourage the development of an urban settlement structure with a positive public environment.**
Ambleton Gateway Node	• Encourage a more intensive built form within the main mixed use node at Ambleton with defined public spaces/streets and a positive pedestrian environment. • Encourage higher density residential development in the node, such as walk-ups, with heights of 2-3 storeys. • Encourage the definition of public spaces in gateway node with mixed use buildings with heights of 2-4 storeys.
Foxhill and Shenstone Nodes	• Encourage a more intensive built form within the local mixed use nodes at Foxhill and Shenstone with defined public spaces/streets and a positive pedestrian environment.
Community Nodes	• Encourage the clustering of community facilities in local nodes along key access routes through residential areas, with schools, sports fields and

	other facilities and heights of 2-3 storeys.
Activity Spine	• Encourage a finer grain of residential development along the activity spine with medium to high densities, buildings located to define the street and options to adapt ground floors to mixed uses in the future. • Encourage a mix of housing types including houses, terraces and walk-ups with heights of 1-2 storeys.
Residential Areas	• Create an identifiable character for each settlement area at Ambleton, Foxhill, Shenstone and Slangspruit so as to create a series of urban neighbourhoods. • Encourage the structuring of new residential areas along access lines and around new community facilities and with an identifiable character. • In more peripheral areas, allow lower densities and encourage the clustering of housing to provide a local sense of place and identity.
Richmond Road Service Area	• Encourage service/mixed use/agri-industrial/commercial buildings facing towards Richmond Road with heights of 2-3 storeys.
INFRASTRUCTURE RESPONSES	**Encourage the use of more sustainable approaches to infrastructure provision.**
Sustainable Infrastructure	• Encourage the use of more sustainable approaches to infrastructure provision for new developments, including Sustainable Drainage Systems (SuDS), renewable energy technologies (e.g. solar panels) and rainwater harvesting (i.e. rainwater tanks). • Retain the ecological integrity of the open space system to provide a green infrastructure network that can assist with surface water management, flood risk attenuation and waste assimilation to reduce the need for hard infrastructure.
Sanitation	• Investigate the options for servicing the settlement growth areas and mixed use spine/nodes with waterborne sewerage within the Slangspruit River catchment. • Investigate the feasibility and potential capacity of a new WWTW in the lower reaches of the Slangspruit River catchment to serve upstream settlements and developments.

6.2.5 PRECINCT 5 : MKHONDENI PRECINCT

PRECINCT ROLE	**Local mixed use role with agricultural, industrial, settlement and environmental functions.**
Ecological Role	• Protection of local environmental assets associated with Mkhondeni River system and catchment.
Economic Role	• Local economic/industrial expansion area around Mkhondeni with improved built form, landscaping and public environment; regional agricultural research role at Ukulinga; sub-regional tourism role at Bisley Valley Nature Reserve.
Social Role	• Local informal settlement upgrade at Sakha settlement.
PRECINCT STRUCTURE	**Precinct bounded by the Mkhondeni River to the south, Mkhondeni industrial area to the east, Bisley Valley Nature Reserve to the north and the rail line to the west.**
Land Form, Drainage and Natural Assets	• Land Form – precinct located along watershed between Mkhondeni River catchment and the Blackborough Spruit/Fox Hill Spruit catchments. • Drainage System – Mkhondeni River is the main river and valley system within the precinct. Small portions of Fox Hill Spruit and Blackborough Spruit catchments along northern edge. • Bisley Valley Nature Reserve – southern portion of Bisley Valley Nature Reserve adjoins the northern boundary of precinct.
Land Uses	• Ukulinga agricultural research facility located within precinct. • Existing Sakha informal settlement located on edge of Mkhondeni industrial area.
Transport and Infrastructure	• Shortts Retreat Road – provides main east-west corridor along northern edge of precinct. • P120 (Bisley Road) – provides north-south linkage through precinct. • Rail – rail line forms western boundary of precinct.
LAND USE SYSTEM RESPONSES	**Mixed use area with industrial expansion, informal settlement upgrading, open space conservation and agricultural research/productive uses.**
Mkhondeni Industrial Area	• Facilitate the expansion of the Mkhondeni industrial/economic development area.
Sakha Informal Residential	• Upgrade existing Sakha informal settlement on edge of Mkhondeni industrial area.
Ukulinga Agricultural Research Facility	• Retain the Ukulinga agricultural research facility and develop its role in providing support for food production and agricultural activities in SEDis.
Open Spaces	• Protect the open spaces associated with the Mkhondeni River system and Bisley Valley nature reserve.
MOVEMENT SYSTEM RESPONSES	**Improve the connectivity and accessibility of the precinct through the extension of the road network and the improvement of public transport and pedestrian network.**
Public Transport	• Improve access to public transport corridors along Richmond Road and the R103.
Pedestrian Network	• All neighbourhoods within the sub-area should be designed to accommodate comfortable and secure pedestrian routes that link to public transport nodes (stops and stations).
Road Linkages	• Develop a new road linkage connecting Mkhondeni and Ambleton extending from Shortts Retreat Road to Richmond Road around the southern edge of Bisley Valley nature reserve.
Tourism Corridor	• Retain the scenic quality of Bisley Road (P120) and utilise this road as a tourism and scenic route connecting Bisley Valley nature reserve with the Mkhondeni and Mpushini River valley areas and tourism opportunities in the Mkhambatini District Municipality.
OPEN SPACE SYSTEM RESPONSES	**Protect and upgrade the open space system to structure the development of the area and to provide environmental services to surrounding settlements and developments.**
Open Space System	• Protect and upgrade the open space system, including the Mkhondeni River system, upper catchment areas of Blackborough Spruit and Fox Hill Spruit, Bisley Valley nature reserve and associated open spaces, biodiversity areas and environmental assets. • Establish open space linkage between Mkhondeni River and Bisley Valley nature reserve.

Environmental Services	• Improve the management of natural habitats (such as wetlands, grasslands and rivers) to increase these habitats' ability to supply environmental services, such as flood avoidance, water regulation and supply, erosion control, waste treatment, nutrient cycling and food production, to surrounding developments.
PUBLIC SPACE, LANDSCAPE AND BUILT FORM RESPONSES	**Encourage the development of an urban settlement structure with a positive public environment.**
Mkhondeni Industrial Area	• Improve the built form, landscaping and public space quality of Mkhondeni industrial estate through the provision of landscaped streets, pedestrian sidewalks, higher quality building frontages onto adjoining access roads and by responding to existing contours to avoid the creation of large scale platforms for new buildings.
Landscape and Views	• Retain existing panoramic views from elevated lands over the surrounding river valley and ensure that building forms are appropriately sited and designed to avoid the creation of obtrusive developments within the landscape.
INFRASTRUCTURE RESPONSES	**Encourage the use of more sustainable approaches to infrastructure provision.**
Sustainable Infrastructure	• Encourage the use of more sustainable approaches to infrastructure provision for new developments, including Sustainable Drainage Systems (SuDS), renewable energy technologies (e.g. solar panels) and rainwater harvesting (i.e. rainwater tanks). • Retain the ecological integrity of the open space system to provide a green infrastructure network that can assist with surface water management, flood risk attenuation and waste assimilation to reduce the need for hard infrastructure.
Sanitation	• Investigate the options for servicing the industrial expansion area at Mkhondeni with waterborne sewerage.
Settlement Upgrade	• Upgrade the Sakha informal settlement through the provision of adequate water, sanitation and electricity services.

6.2.6 PRECINCT 6 : CENTRAL PRECINCT

PRECINCT ROLE	**Environmental, agricultural, recreational and tourism heart of the SEDis area.**
Ecological Role	• Heart of SEDis providing for protection of local and sub-regional environmental assets.
Economic Role	• Local and sub-regional food production, agriculture, tourism and services.
Social Role	• Local and sub-regional recreation and sporting activities.
PRECINCT STRUCTURE	**Precinct organised around the open space/agricultural/amenity core of SEDis**
Land Form, Drainage and Natural Assets	• Mkhondeni and Mpushini Rivers – main rivers within precinct creating ridge and valley systems running west-east. • Mpushini Protected Area – associated with Malkopspruit, a tributary of Mpushini River.
Land Uses	• Tourism and amenity uses, including game farms, tourist accommodation, holiday homes, etc.
Transport and Infrastructure	• P120 (Bisley Road) – provides north-south local linkage through precinct. • D352 – gravel road providing east-west local linkage through precinct.
LAND USE SYSTEM RESPONSES	**Retain precinct as a rural/agricultural/tourism area with limited, low impact developments that support productive, conservation and tourism uses.**
Productive Use Areas	• Retain and facilitate sustainable food production and agricultural activities on suitable lands. • Productive uses along eastern edges of rail line parallel with Richmond Road, including small scale, subsistence and communal agriculture.
Tourism and Recreation	• Promote the development of sustainable local tourism and recreational facilities.
Rural Residential	• Limit the development of rural residential uses and ensure that any such uses are low impact in terms of the environment and landscape.
Open Space	• Protect the open spaces associated with the Mkhondeni and Mpushini River systems and the Mpushini Protected Area.
MOVEMENT SYSTEM RESPONSES	**Improve the connectivity and accessibility of the precinct to the surrounding edge corridors through the upgrading of existing roads.**
Public Transport	• Improve access to public transport corridors along Richmond Road and the R103.
Road Linkages	• Develop a new road linkage connecting Bisley Road (P120) and D352 to Richmond Road and the Ambleton mixed use node.
Tourism Corridor	• Retain the scenic quality of Bisley Road (P120) and utilise this road as a tourism and scenic route connecting Bisley Valley nature reserve with the Mkhondeni and Mpushini River valley areas and tourism opportunities in the Mkhambatini District Municipality.
OPEN SPACE SYSTEM RESPONSES	**Protect and upgrade the open space system to provide structure the development of the area and to provide environmental services to surrounding settlements and developments.**
Open Space System	• Protect and upgrade the open space system, including the Mkhondeni and Mpushini River systems and associated open spaces, biodiversity areas and environmental assets.
Environmental Services	• Improve the management of natural habitats (such as wetlands, grasslands and rivers) to increase these habitats' ability to supply environmental services, such as flood avoidance, water regulation and supply, erosion control, waste treatment, nutrient cycling and food production, to surrounding developments.
PUBLIC SPACE, LANDSCAPE BUILT FORM RESPONSES	**Encourage the development of a low impact agricultural/rural/tourism structure with a limited number of high quality, low impact tourism nodes.**
Landscape and Views	• Retain existing panoramic views from elevated lands over the surrounding river valleys. • Ensure that building forms are appropriately sited and designed to avoid the creation of obtrusive developments within the landscape.
Mpushini Rail Viaduct	• Maintain the Mpushini rail viaduct as a key piece of rail infrastructure and as an important visual, built form, engineering and heritage feature within the landscape and incorporate the bridge as part of amenity walks and scenic views in the area.

Built Form	• Encourage the clustering of rural settlement and buildings to avoid sprawl and create places with form and identity in the landscape.
INFRASTRUCTURE RESPONSES	**Encourage the use of more sustainable approaches to infrastructure provision.**
Sustainable Infrastructure	• Encourage the use of more sustainable approaches to infrastructure provision for new developments, including Sustainable Drainage Systems (SuDS), renewable energy technologies (e.g. solar panels) and rainwater harvesting (i.e. rainwater tanks). • Retain the ecological integrity of the open space system to provide a green infrastructure network that can assist with surface water management, flood risk attenuation and waste assimilation to reduce the need for hard infrastructure.

6.3 STRATEGIC INTERVENTIONS

6.3.1 EXISTING STRATEGIC INTERVENTIONS

There are a number of existing strategic interventions that are planned or proposed that will have a profound influence on the development of the SEDis area. This includes the following:

- **IRPTN/BRT** – this will transform the public transport system of the city and has the potential to significantly improve connectivity between the SEDis and the city, CBD and employment areas
- **Regional Cemetery** – a regional cemetery has been proposed along the eastern edge of Richmond Road that will make a significant contribution to the burial requirements of the city

These existing and planned initiatives should be supported and their potential to impact positively on the development and management of the SEDis area should be promoted. In particular, the investment proposed into a feeder bus route as part of the IRPTN should be leveraged and supplemented to contribute to a restructuring of the eastern and western settlements along the R103 and Richmond Road respectively. The IRPTN bus stops should form the focus for the development of sustainable, walkable urban nodes serving the adjacent communities. Mixed use development and increased densities should be facilitated within and in close proximity to these nodes.

In the case of the Richmond Road feeder route, the option of rerouting the high friction bus route through the settlement areas along the proposed activity spines should be encouraged and the option of a high speed/express type service considered for the Richmond Road corridor. The location of the bus route along the activity spine will ensure greater access for local communities, improved thresholds for the bus services and has the potential to generate significant spin-offs in terms of strengthening the spines, encouraging the development of local shopping and community facilities, etc.

6.3.2 PROPOSED STRATEGIC INTERVENTIONS

Concept sketch designs have been prepared for a number of key priority action areas to translate the broad level policies and guidelines of the Development Framework into spatial development concepts that can be costed and packaged. This includes urban design and layout proposals aimed at creating practical, sustainable, memorable and high quality urban and rural environments.

The concept sketch designs have been selected to provide a representative sample of different types of landscape character areas and development challenges across the SEDis area. The concept sketch designs locations identified include the following (see Figure 6-3):

1 Ashburton Settlement and Mixed Use Node
2 Umlaas Road Business Estate
3 Ambleton Settlement and Mixed Use Node
4 Open Space/Agriculture/Tourism Interface

Figure 6-3 : Location of Proposed Strategic Interventions

Ashburton Settlement and Mixed Use Node

Ashburton has been selected to demonstrate how the existing settlement can be transformed over time into a well-structured, high quality urban environment with a central node as a strong focal point, more liveable public spaces, a safe and attractive pedestrian environment, more responsive building edges, high quality landscaping, etc. Figure 6-5 shows the concept sketch design for Ashburton.

Umlaas Road Business Estate

The Umlaas Road area has been selected to demonstrate how this potential strategic node along the N3 corridor can be developed into a high quality industrial/business estate with a range of industrial/economic uses, sensitive siting of developments and interface with adjacent corridors and the open space system, high quality design and landscaping and adequate provision of services and access. Figure 6-6 shows the concept sketch design for Umlaas Road.

Ambleton Settlement and Mixed Use Node

The Ambleton node has been selected to demonstrate how this existing intersection can be developed into an intensive mixed use node that provides a new focal point for existing and future local communities in the growing Ambleton area. The design for the node seeks to create a high quality built and natural environment with multi-functional public spaces that support pedestrians, markets, social engagement, access to public transport, adjacent commercial and community facilities, higher density housing, etc. Figure 6-7 shows the concept sketch design for Ambleton.

Open Space/Agriculture/Tourism Interface

The interface area has been selected to indicate how a high quality rural/ agricultural/tourism environment can be created that promotes ideas of urban resilience, food production and security, sustainable livelihoods, local employment and skills development, alternative lifestyle options to urban or suburban models, etc. The design for this interface seeks to promote opportunities for a range of agricultural, rural and tourism activities, such as urban agriculture, market gardens, game farms, tourism products, commercial and subsistence farming, etc. Figure 6-8 shows the concept sketch design for the open space/agricultural/tourism interface.

Clustered Housing Integrated with the Landscape Setting

Structured and Landscaped Industrial/Warehousing Development integrated with Open Space System

Interface between Settlement and Agriculture

Figure 6-4 : Built Form Design Examples

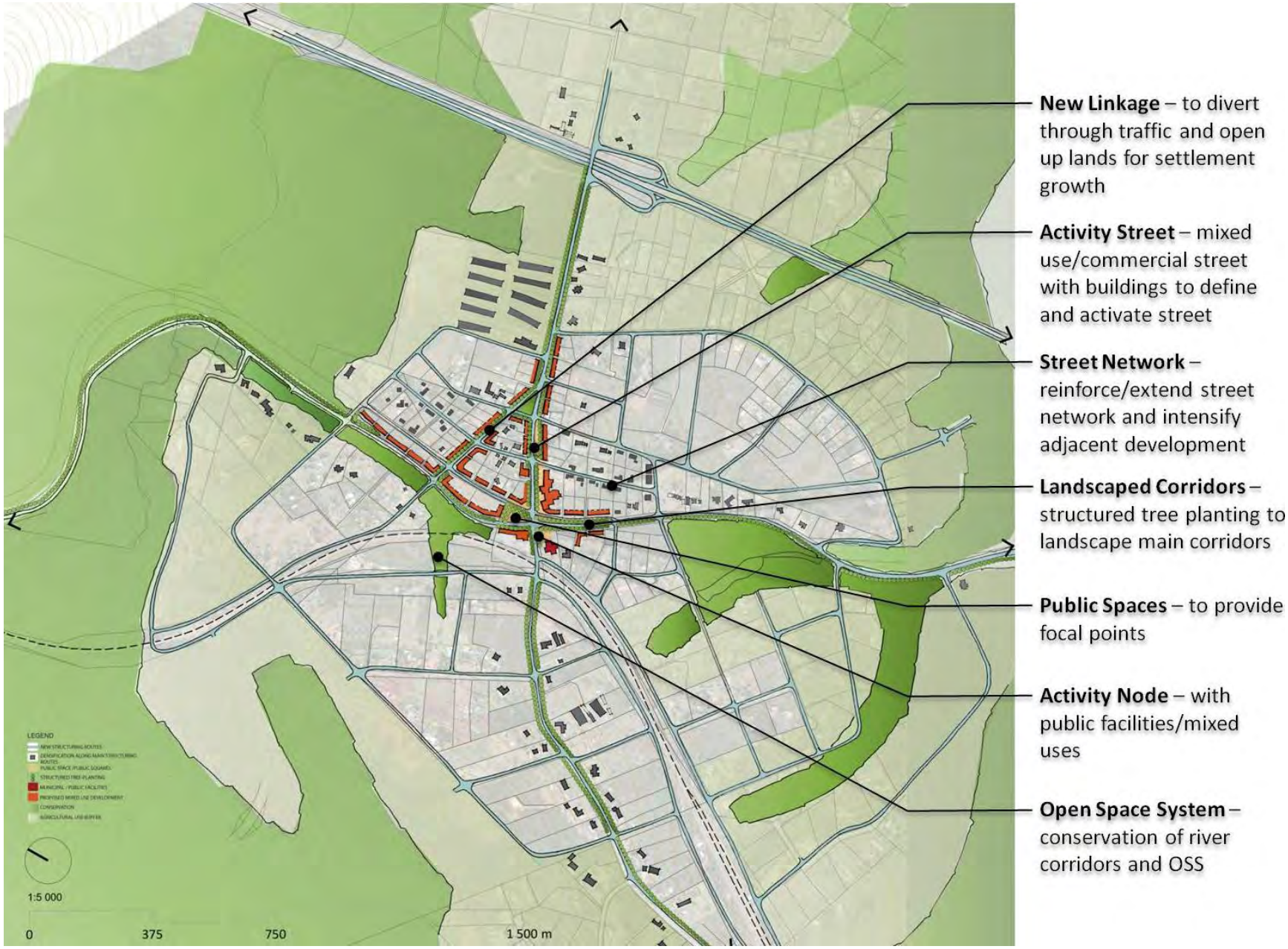


Figure 6-5 : Ashburton Settlement and Mixed Use Node

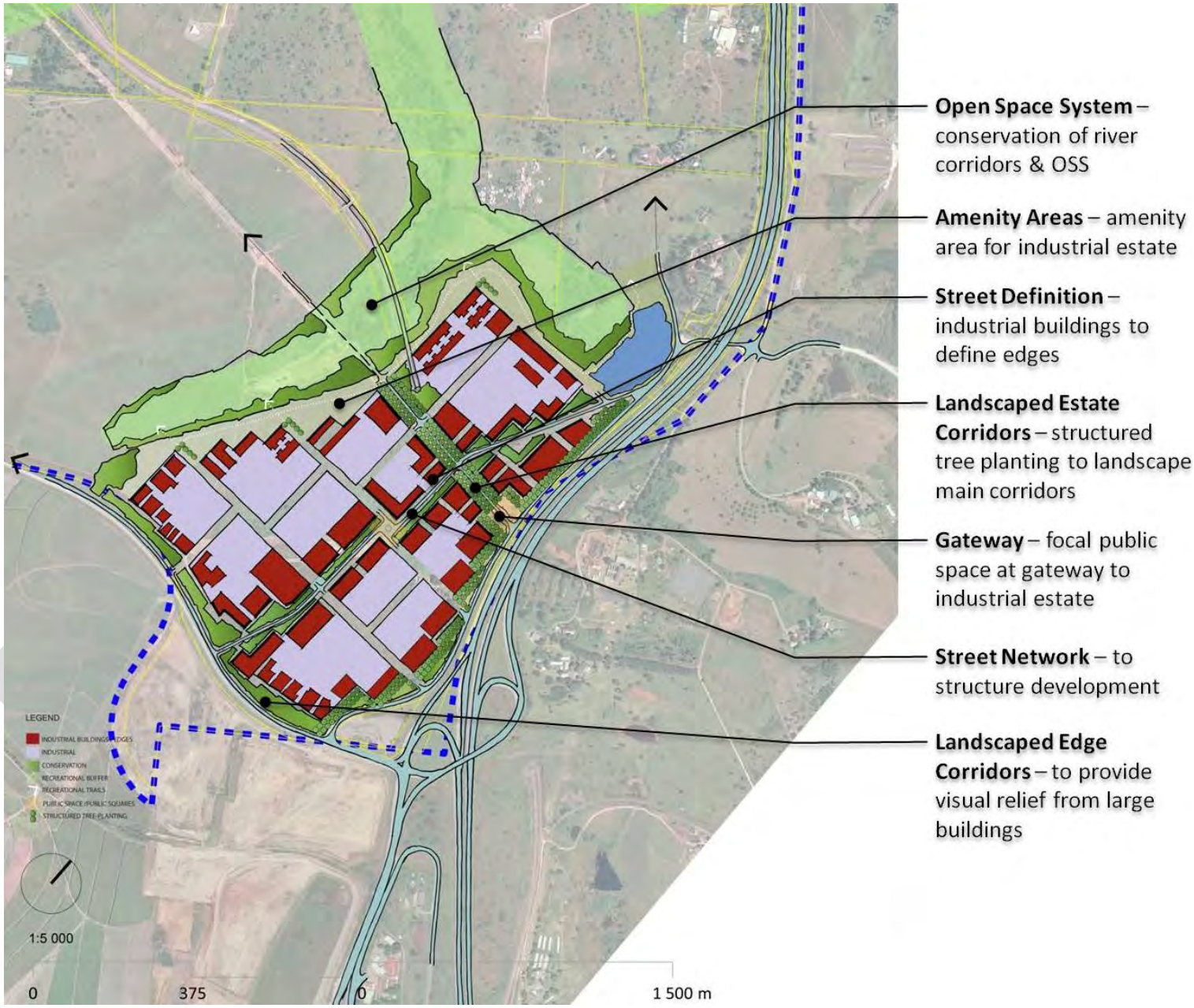


Figure 6-6 : Umlaas Road Business Estate

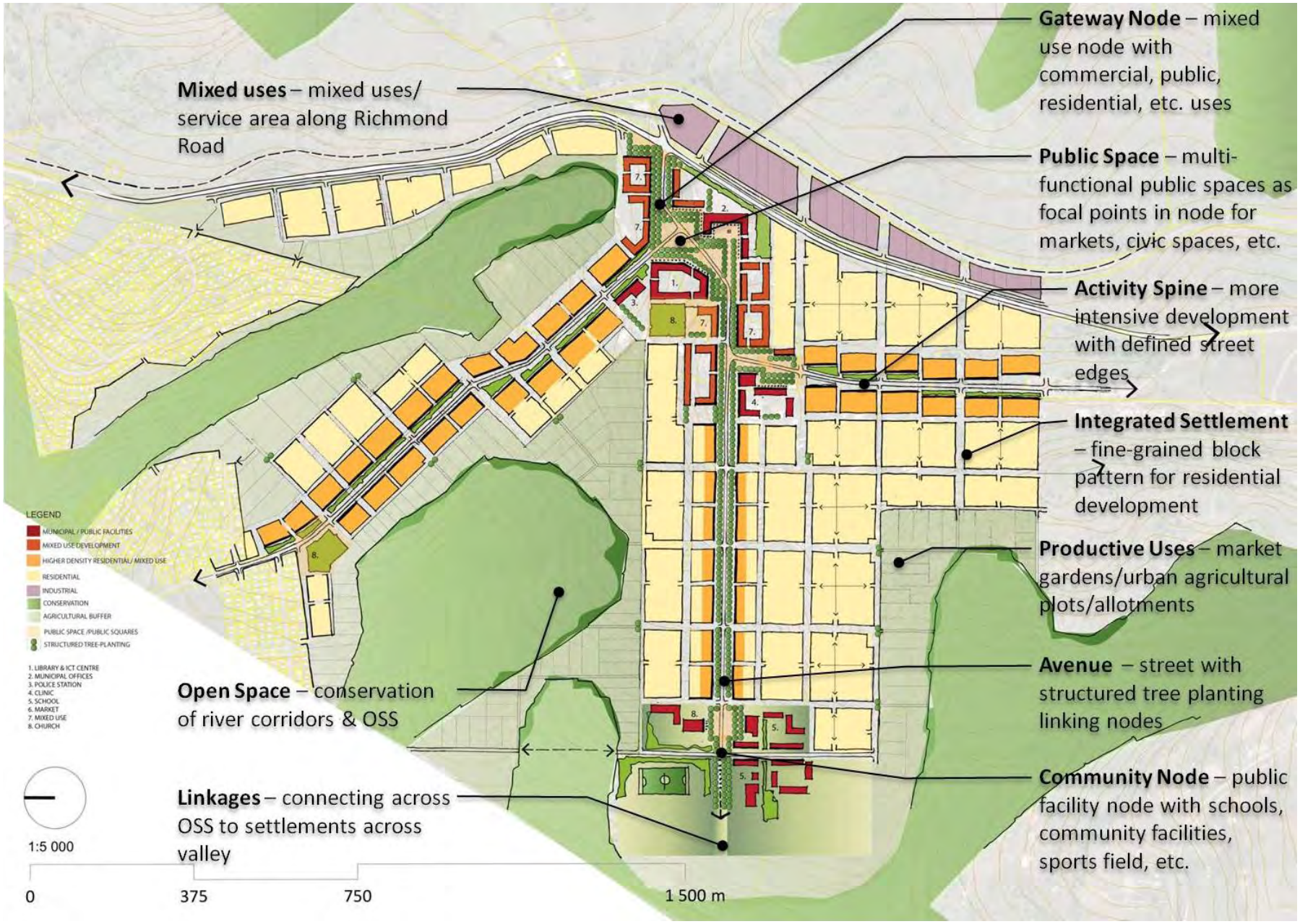


Figure 6-7 : Ambleton Settlement and Mixed Use Node

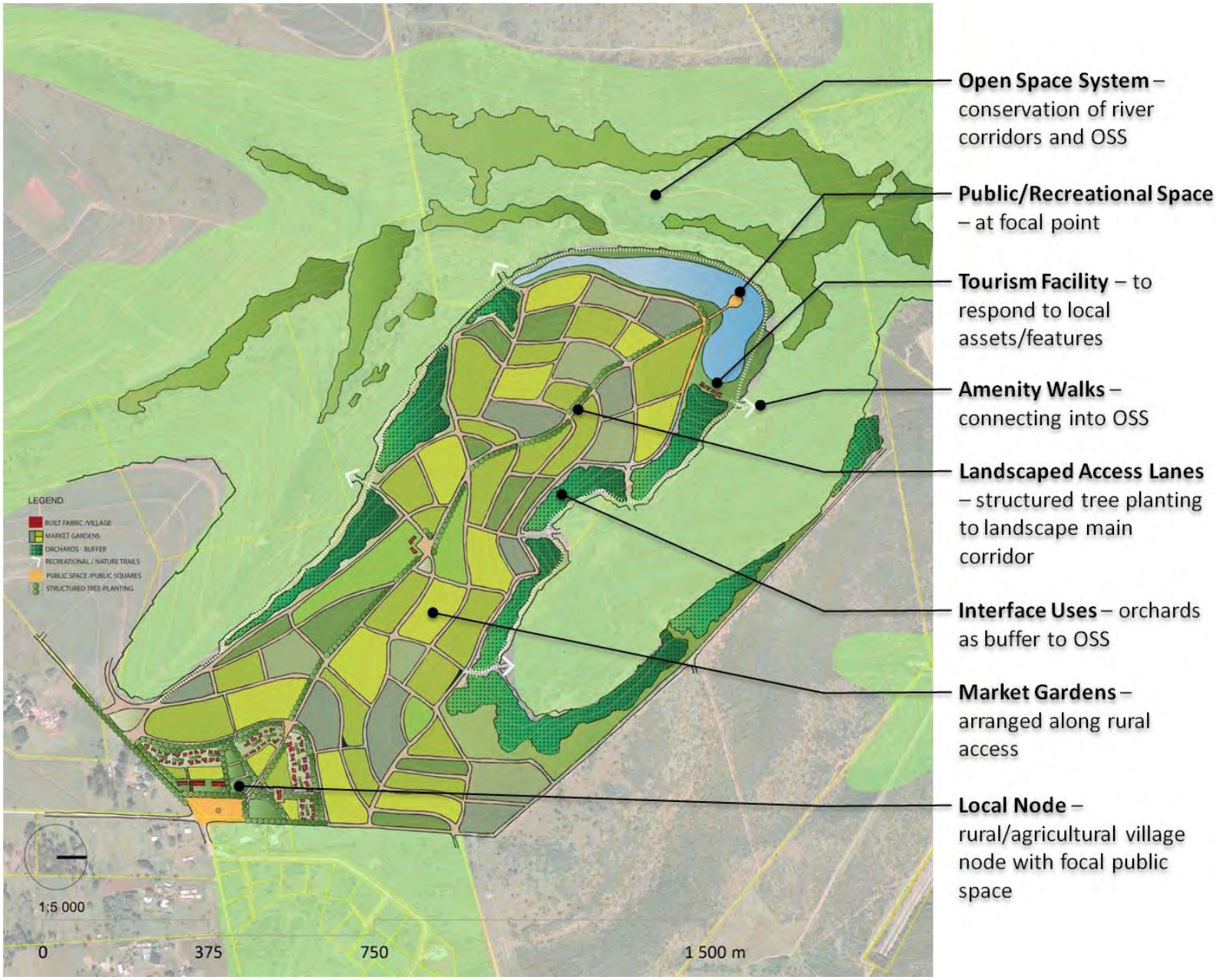


Figure 6-8 : Open Space/Agriculture/Tourism Interface

6.4 URBAN DESIGN GUIDELINES

The development of future residential areas, mixed use nodes and/or business parks in different precincts, as set out under the Spatial Frameworks and Precinct Guidelines above, will need to be guided by appropriate urban design guidelines to ensure that both the built form and landscape can be designed to facilitate the creation of human-scale, attractive, safe and integrated human settlements.

6.4.1 RESIDENTIAL AREAS

Layout and Character (Block and Subdivision Layout and Land Use)

1. Residential areas should be designed as **neighbourhoods that form part of an identifiable "village"** (urban or suburban) and which has a distinctive character. The character should be determined by the type and scale of streets, mix of building typology, landscaping, and by a mix of residential densities.
2. The character of residential areas/neighbourhoods or parts thereof should reflect the location of the neighbourhood in the precinct in which it is situated, and it should display clearly its urban and/or suburban features.
3. Residential areas should be structured by a hierarchical road and pedestrian network.
4. The structure of residential areas should be articulated by the location of community facilities and public places in central and or accessible locations which provide landmarks and legibility to the neighbourhood.
5. The structure of residential areas should be articulated by the shape, extent and potential use of the proposed open space network of the precinct within which it falls i.e. active open space or natural open space.
6. Higher density areas should be located in and around mixed use nodes and along public transport routes. Lower density areas should be located adjacent to rivers, streams and valleys, on steeper slopes, i.e. adjacent to the proposed open space system. Densities should align with the Land Use and Activity Framework and be sensitive to the local context, available infrastructure and services, etc.
7. The layout of residential areas should respond clearly to important view sheds and vistas.
8. Wherever possible existing vegetation or distinctive site features should be incorporated into the layout of the area.

Public Realm

1. Streets, squares and parks should generally be treated as part of the overall open space system to provide linkage and structure to neighbourhoods.
2. Lower order streets and streets serving higher densities should be designed as multifunctional spaces to accommodate parking, play spaces etc.
3. Streets and spaces should accommodate pedestrian activity in accordance with the role of the road/street in the overall precinct movement network.
4. Streets and public spaces should incorporate facilities for public transport and provision for disabled persons.
5. Landscaping should provide protection from climatic conditions of wind and sun and create street character and identity.
6. Lighting should be commensurate with the function of a street and/or public space.
7. Access and circulation networks and infrastructure for pedestrians and vehicles should be clearly differentiated.
8. Pedestrian route design should be integrated with overall neighbourhood design to ensure comfort and convenience for pedestrians and appropriate linkage with surrounding neighbourhoods.

Built Form

1. Building massing, and hence density, should conform to the density distribution guidelines in the Land Use and Activity Framework and be responsive to local circumstances.
2. Built form in higher density areas should be medium rise in accordance with location to other uses and activities in the area and should be used to define the character of the neighbourhood.
3. Building frontages, particularly in medium and high density typologies, should contribute to the public nature of streetscape. This can be accomplished through locating entrances at street level and through ensuring maximum surveillance of the street from units facing the street.
4. Building forms (in conjunction with the use of appropriate material, colours and textures) should be articulated and modulated to ensure a human scale and to merge in with surrounding landscape.
5. Built form in low density areas should be conceived of as "elements in the landscape" and should be unobtrusive in terms of massing, colours and materials.

6.4.2 MIXED USE NODES

Layout and Character (Block and Subdivision Layout and Land Use)

1. Nodes should be designed and developed as "village or town centres" which display an integrated and cohesive character including a "high street", public squares and spaces, fine grain block and subdivision pattern, fine grain building scale, identifiable townscape/landscape character, extensive tree planting, high levels of pedestrian orientation, mixes of building type and activity, including residential, and provision for public transport. The character should reflect its role in the municipal area and/or the surrounding settlement, i.e. urban, local, etc.
2. Node developments should include a landmark element(s) that indicates its location in the district or neighbourhood in which it is located. This could be in the form of an appropriately scaled tower building, flagpole or gateway structure/feature.
3. Node gateways/entrances should be clearly visible and celebrated through the use of landmark landscaping elements (planting or structural) and/or through the appropriate siting of buildings.
4. Node edges should include interfaces that are integrated with and sympathetic to surrounding residential areas in terms of access and movement, scale of built form, scale and type of landscaping.
5. Edges and interfaces with limited access roads should be landscaped and/or architecturally treated to contribute to the experience of the road users. No service areas should face on to these roads unless adequately and appropriately screened.
6. Service areas should be hidden from view and should not impact on public spaces or on adjacent development or roads by way of noise, visual intrusion, smell, etc.
7. Views lines in and out of the node onto landmark features or of special features/viewsheds of the node or of its surroundings should be accommodated in the layout of the node so as to encourage integration with the surroundings.
8. Land use mixes should reflect the role and hierarchy of the node.
9. Wherever possible existing vegetation or distinctive site features should be incorporated into the layout of the node.

Public Realm

1. Streets, squares and parks should generally be treated as part of an integrated open space system to provide "linkage and structure" to the node, but also as the spaces in which public life occurs.
2. Streets and spaces should accommodate pedestrian activity in accordance with the role of the road/street in the overall precinct movement network.
3. Streets and public spaces should incorporate facilities for public transport and provision for disabled persons.
4. Hard (square) and soft (parks) public spaces and parking areas should be designed as focal points within the open space system linked together with streets as part of the overall public space system.
5. Street and public place design including landscaping should reflect a community/ public character and scale.
6. Landscaping should provide protection from climatic conditions of wind and sun and create street character and identity.
7. Lighting should be commensurate with the function of a street and/or public space.
8. Access and circulation networks and infrastructure for pedestrians and vehicles should be clearly differentiated. Pedestrian routes should be designed to ensure comfort and convenience for pedestrians and should not be provided as an afterthought.
9. Pedestrian movement should be integrated with surrounding areas and landscaping should contribute to movement hierarchy and to protection from sun and wind and should contribute to safety and security through lighting and appropriate route location.
10. Parking areas should be integrated with the node fabric as public space. They should be landscaped to prevent heat build up, to attenuate storm water and to integrate building clusters.

Built Form

1. Built form in nodes should be concentrated and compact so as to define public spaces and places between them and so as to convey their public status in the landscape.
2. Built form should be fine "grain" and human scale – either as a collection of small buildings grouped tightly together or as larger buildings with fine grain modulation of facades and elevations.
3. Buildings should accentuate the role and character of the node with respect to scale and building typology.
4. Building massing and its articulation should be used to integrate nodes with surrounding residential areas. There should be no "back of building" conditions.

5. Built form should be used to articulate and/or celebrate gateways and intersections and should provide landmark features within the overall settlement fabric.
6. Ground floor uses of buildings should be pedestrian oriented uses that provide interest, generate street activity and ensure surveillance of the street or public place onto which they face.
7. Roofs should be integrated with surrounding buildings and environments in terms of shapes and sizes, elevations, colours and textures so as to create an unobtrusive but interesting contribution to the landscape.

6.4.3 BUSINESS PARKS

Layout and Character (Block and Subdivision Layout and Land Use)

1. Business Parks should be designed and developed to display an integrated and cohesive character. The character should reflect its role in the municipal area and/or the surrounding settlement, i.e. urban, local etc.
2. Although Business Parks will predominantly consist of light industrial, warehousing and office uses, it should also accommodate other support uses including commercial, recreation, social and high density residential components to create an environment that meets a range of employees' needs (e.g. restaurants, shops, child care facilities, gyms/recreation centres), facilitates a more vibrant atmosphere, and allows for 24 hour use of the area, improving security and safety.
3. Business Park layout should provide for human-scale public squares and spaces, a fine grain block and subdivision pattern, fine grain building scale, identifiable townscape/landscape character, extensive tree planting/landscaping, high levels of pedestrian orientation, mixes of building type and activity, including residential, and provision for public transport.
4. Business Park developments should include a landmark element(s) that indicates its location in the district or neighbourhood in which it is located. This could be in the form of an appropriately scaled tower building, flagpole or gateway structure/feature.
5. Business Park gateways/entrances should be clearly visible and celebrated through the use of landmark landscaping elements (planting or structural) and/or through the appropriate siting of buildings.
6. Wherever possible existing vegetation or distinctive site features should be incorporated into the layout of the Business Park. Landscaping should be indigenous in keeping with the sub-tropical character of the area.
7. Business Park edges should be integrated with, and sympathetic to, surrounding and internal residential areas and developments in terms of access and movement, scale of built form, and scale and type of landscaping.
8. Site design should ensure compatible transition from light industrial/warehousing uses to less intensive land uses, using streets, landscape features, open space/recreation areas or landscaping to effectively buffer uses.
9. Sites used for light industrial and warehousing purposes should be orientated towards access roads, and should not be accessible through residential streets.
10. Edges and interfaces with limited access roads (e.g. N3/R56) should be landscaped and/or architecturally treated to reduce visual impact and contribute to the experience of the road users. No service areas should face on to these roads unless adequately and appropriately screened.
11. Service areas should be hidden from view and should not impact on public spaces or on adjacent development or roads by way of noise, visual intrusion, odour etc.
12. Views lines in and out of the Business Park onto landmark features or of special features/viewsheds of the Business Park or of its surroundings should be accommodated in the layout of the Business Park so as to encourage integration with the surroundings.
13. A mix of site sizes should be provided to allow for a range of development options.
14. A land use mix on large sites should be encouraged to blend industrial warehouse and office uses with supporting uses creating a more human-scale and employee-friendly environment (multi-purposed facilities).

Public Realm

1. Streets, squares and parks should generally be treated as part of an integrated open space system to provide "linkage and structure" to the node, but also as the spaces in which public life occurs.
2. Streets and spaces should accommodate pedestrian activity in accordance with the role of the road/street in the overall precinct movement network.
3. Streets and public spaces should incorporate facilities for public transport and provision for disabled persons.

4. Hard (square) and soft (parks) public spaces and parking areas should be designed as focal points within the open space system linked together with streets as part of the overall public space system.
5. Street and public place design including landscaping should reflect a community/ public character and human scale.
6. Landscaping should provide protection from climatic conditions of wind and sun and create street character and identity.
7. Lighting should be commensurate with the function of a street and/or public space.
8. Access and circulation networks and infrastructure for pedestrians and vehicles should be clearly differentiated. Pedestrian movement should be integrated with surrounding areas, and pedestrian routes should be designed to ensure comfort and convenience for pedestrians and should not be provided as an afterthought.
9. Landscaping should contribute to the movement hierarchy, to protection of pedestrians from sun and wind and should contribute to safety and security through lighting and appropriate route location.
10. Public parking areas should be integrated with the Business Park developments as public space. They should be landscaped to prevent heat build up, to attenuate storm water and to integrate building clusters. Extensive parking areas in front of buildings should be broken up into smaller components and/or placed behind buildings to improve the human scale and the integration of elements within the Business Park.

Built Form

1. Built form in Business Parks should be as concentrated and compact as possible (within the limitations of the type of use) so as to define public spaces and places between them, and to create a human scale.
2. Built form should be fine "grain" and human scale – either as a collection of small buildings grouped tightly together or as larger buildings with fine grain modulation of facades and elevations.
3. Buildings should accentuate the role and character of the Business Park through building design, scale and typology.
4. Built form should be used to articulate and/or celebrate gateways and intersections and should provide landmark features within the overall settlement fabric.
5. Building orientation and massing should be used to integrate the Business Park with surrounding residential areas and other uses. Large and bulky industrial buildings and ancillary structures should be oriented away from residential development/areas to avoid a negative visual impact.
6. A back-to-back relationship between light industrial and residential buildings is preferable where transitional uses are not in place, but may require substantial screening of unsightly views to ensure compatibility.
7. Buildings (including main entrances and pedestrian access) should be oriented towards the street. There should be no "back of building" conditions, or if this is unavoidable appropriate screening should be used to ensure no negative visual impact to adjacent uses.
8. Ground floor uses of commercial or mixed use buildings should be pedestrian oriented uses that provide interest, generate street activity and ensure surveillance of the street or public place onto which they face.
9. Roofs should be integrated with surrounding buildings and environments in terms of shapes and sizes, elevations, colours and textures so as to create an unobtrusive but interesting contribution to the landscape.

7 Implementation Framework

7.1 Overall Approach

The SEDis area is one of the main growth areas identified within Msunduzi and has the potential to make a significant contribution to the spatial restructuring of the city, the accommodation of urban settlement growth, the generation of economic investment and employment and the protection of environmental and agricultural assets. This potential will not be realised, however, if development is allowed to occur in a "business as usual" and reactive development control manner.

The Municipality has, however, through the LAP project, initiated a process which is proactive and forward looking by identifying and assessing long term needs for land release and for associated infrastructure and transportation requirements. However, the efficient and sustainable development of the SEDis area will require ongoing significant, strategic and proactive intervention by the Municipality, in conjunction with other key role players, to change the nature of planning and development in the area and to influence the spatial redirection of both private and public investment.

The institutional context and significant growth pressures and development needs within the area requires that the Municipality takes a firm and clear stand on leading and initiating change in those areas of development and/or management that are resulting in adverse impacts in the area and on the uncertainty of investors and the resident community. Other stakeholders will need to be involved, encouraged and supported, but the Municipality will need to intervene initially to show commitment to the growth, development and restructuring of the SEDis area.

As has been previously noted, the area has extensive greenfield lands and, given the size, nature and complexity of the study area, it is considered appropriate to adopt an implementation approach focused around a series of phases of development and the supporting actions and projects necessary to develop these. This will in turn need to be supported by the requisite institutional capacity, financial resources and political will to ensure orderly and sustainable development, and to initiate and deliver projects, in accordance with the provisions of the LAP.

7.2 Implementation Framework

The following key interventions will be necessary in order to initiate and/or consolidate development investment spatially within the SEDis area in a manner that reinforces sustainable economic growth objectives in the Msunduzi IDP and that are necessary to create employment and reduce poverty. The key interventions are identified and explained below:

- Coordinate, integrate and align activities and energies of all key stakeholders
- Release land for development in a coordinated manner
- Align public investment for infrastructure, transportation, housing, community facilities
- Prioritise more detailed levels of planning in areas that will require rezoning
- Enforce the Urban Development Line and Development Phasing Line.

7.2.1 Coordination, Integration and Alignment of Stakeholders

In the first instance, it will be necessary for the Municipality to take the lead through playing an active coordinating and directing role in the area. In this regard, three areas of co-ordination should be targeted:

Alignment of Municipal Stakeholders

The objective is to ensure that all municipal sectors are made fully aware of the SEDis initiative and that their respective planning and budgets reflect the intentions of the initiative. The PSC for this project could be the initial co-ordinating mechanism.

Alignment of other key Public Stakeholders

All provincial and national spheres of government and parastatals should made fully aware of the SEDis initiative and urged to align their respective planning and budgets to reflect the intentions of the initiative.

Co-ordination of Private and Community Stakeholders

A development forum consisting of key public and private sector development stakeholders in the area should be established in order to confirm and communicate a common direction for SEDis and to achieve a greater level of coordination with

respect to individual stakeholder investment objectives. The objectives of the forum should be based on the following principles:

1. Understanding and supporting existing energies and strengths of all stakeholder groups (i.e. Msunduzi Municipality, business, community and conservation groups, Departments of Transport, Human Settlements, Agricultural and Environmental Affairs and Cooperative Governance and Traditional Affairs, etc). Establishing what initiatives exist/or require establishing and communicate how SEDis fits into municipal priorities.
2. Focusing investment sectorally and spatially – identifying and agreeing on common areas for both new development areas and for brownfields development and/or redevelopment.
3. Integrating investment by promoting projects and initiatives that mix public and private investment, where necessary, to achieve common goals.
4. Shared benefits by ensuring that all stakeholders benefit from opportunities for development created by public investment.

7.2.2 Land Release Approach

An effective land release approach is required in order to release land for development in a co-ordinated manner that will achieve the development objectives of the LAP. This will need to focus on:

- Where land should be released for development
- How much land should be released
- What types of uses should be promoted

Where should land be released for development?

The release of land for urban development has been informed by the objectives of the SEDis project as they relate to all of the Msunduzi Municipality's existing policies with respect to the establishment of compact and integrated cities. However, it has also been considered in the light of the commitments and stated intentions of the Municipality, other government entities and the private sector.

The key element of the land release approach is to release land for both residential and non-residential purposes in a manner that consolidates the existing fragmented urban form and that concentrates development around the proposed main transportation spines and nodes within the area. It is necessary for there to be a shared commitment to this as both the state and private sector stakeholders have previously struggled to deliver development informed by these sustainability imperatives. In this context, priority should be given to releasing land in areas where market demands intersect with infrastructure capacity or where infrastructure can be easily extended whether it is by the private sector or public sector or in some form of partnership (see Figure 7-1, which indicates the land release approach for SEDis).

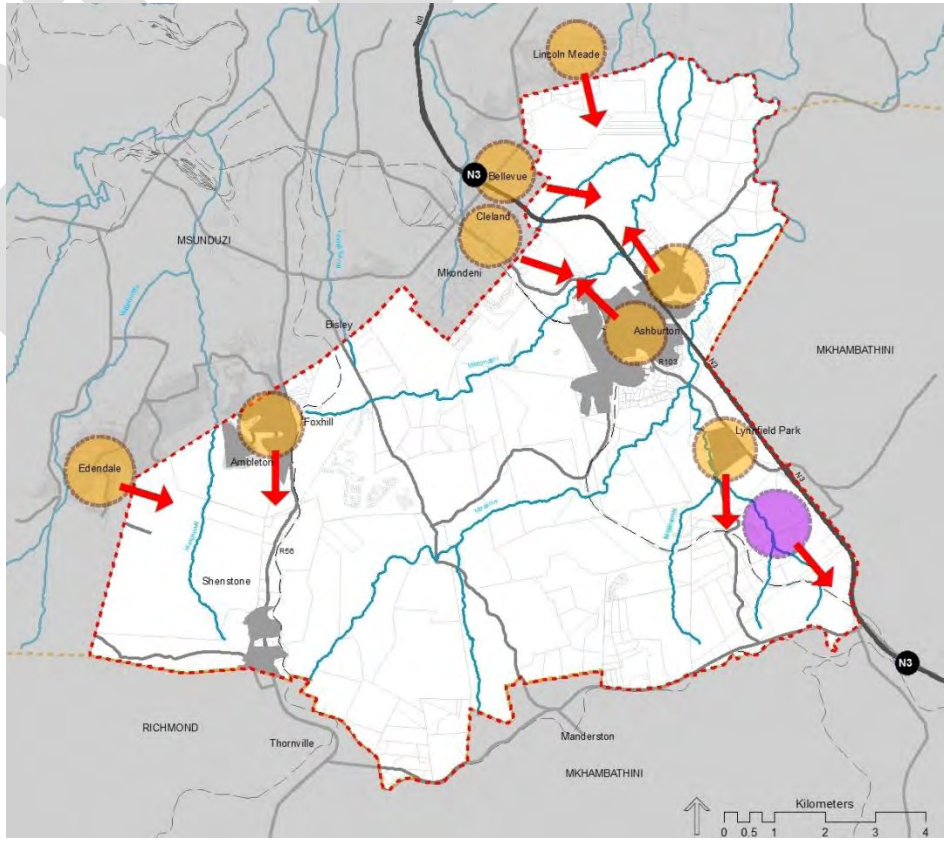


Figure 7-1 : Land Release Approach

It will do this through releasing land for development in the following key areas:

- Ambleton/Shenstone urban settlement growth area
- Richmond Road services/mixed use growth area
- Lynnfield Park/D354 urban settlement growth area
- Umlaas Road economic/business growth area
- Northeast precinct urban settlement and mixed use growth area

How much land should be "released"?

The quantum of land that will be required to accommodate residential and economic growth for the next 20 years has been determined through the Scenario Development phase of the project and is summarised in Table 7-1.

Table 7-1 : Land Requirements

LAND USE	Demand Based on Medium Scenarios	Supply over Short to Medium Term	Total Supply in SEDis over Long Term
Settlement (Residential/ Commercial/ Community)	591ha	1 158ha	1 655ha
Logistics/ Industrial	180ha	239ha	366ha
TOTAL	771ha	1 397ha	2 073ha

Note: The supply lands identified above relate to the developable areas for these land uses (refer to Table 8-2).

It should be noted that the above supply land quantums have factored in a proportion that will be undevelopable due to physical or environmental constraints (refer to Table 8-2). Site specific constraints may, however, result in additional areas not being developable and some lands may also not be released due to market factors or competing land uses. The supply of lands over the next 20 years accordingly provides for a factor of between two and three times the demand to ensure that there will be sufficient lands available to service development demands in the future.

Given the 20 year timeframe used for identifying the supply of potential development lands, it will be important to provide for the phasing and orderly development of lands. This will be guided by the phasing provisions in the Land Use and Activity Framework and the Infrastructure and Services Framework and also by good planning principles in relation to proximity to existing development, avoiding leapfrogging, access to transport and infrastructure, etc. Figure 7-2 indicates the short term/short to medium term phasing of development lands in green and medium term/medium to long term phasing in orange. There are also additional lands to the southwest (in Shenstone) and to the northeast (northeast of Ashburton North) that can be considered for development in the long term.

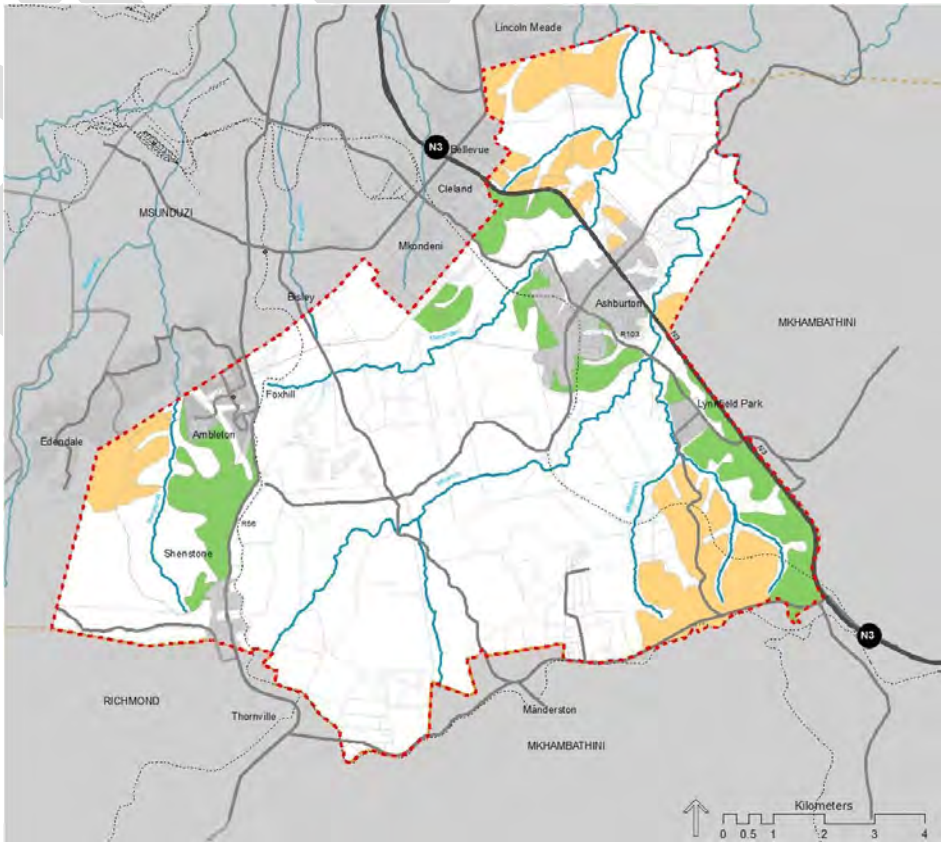


Figure 7-2 : SEDis Opportunity Areas in the Short to Medium Term

The exact phasing of development by private developers in the targeted areas in the next 20 years will, however, be difficult to predict and therefore an approach should be adopted that provides for a level of flexibility within the targeted areas. Such an approach provides for a 'window' of development opportunities that can be sustainably serviced and allows for a developer to choose where within the 'window' development will occur. The additional lands to the southwest and northwest will also need to be considered for release once a reasonable quantum of the short and medium term lands have been developed and/or as municipal priorities and servicing availability dictate.

What type of uses should be promoted?

In present day development processes the overwhelming demand from the private sector is for land uses that allow for greater degrees of flexibility whilst the public sector still seeks to secure some greater development certainty in space through relatively traditional zoning instruments. Raising densities and improving urban efficiencies does require a greater degree of flexibility within defined parameters, but also demands levels of public funding and private sector responsiveness that have been absent in many areas. Note should be taken of some of the following imperatives:

- Appropriate housing mix – this must be made possible to deliver housing opportunities across the full spectrum to avoid the existing binary of low cost vs. middle class cluster development.
- Mixed use commercial – areas with a predominant commercial character could also accommodate mixes of residential and light industrial as well as appropriate institutional uses.
- Mixed use light industrial – areas with a predominant light industry character could also accommodate varieties of commercial and residential uses as well as appropriate institutional uses.
- General industry and light industry mixes could include agri-processing, industrial processes and the like.
- Agriculture, leisure and environmental land uses.

7.2.3 Alignment of Public Investment

Alignment of Bulk Infrastructure Investments

Key bulk infrastructure elements relating to transportation, water and sanitation should be phased and prioritised towards the servicing of the targeted land release areas described above. Principles that could be used to guide investment phasing within the 20 year planning horizon include:

- Infrastructure investment by public sector may need to invest ahead of demand in order to direct and facilitate private sector investment in targeted areas. This will be particularly important in order to unlock important housing and economic/industrial developments along Richmond Road and the R103.
- Infrastructure investment should be monitored against actual development demand within the targeted areas and public investment structured so as to ensure that it will leverage private and other public development investment in these targeted areas.
- Infrastructure required for public housing should be phased as far as possible to align with requirements to service land for private investment that will result in employment generating land uses.

Alignment of Housing Investments

A key driver of new urban development will be the provision of new public low and middle income housing to meet expected population growth and to accommodate relocations from informal settlement upgrading programmes. The programme for the delivery of Greenfield or upgrading projects that have already been identified should be revisited in terms of their phasing in order to align the associated investment with that of the bulk infrastructure investment identified to serve the targeted land release areas.

7.2.4 Priority Planning Actions

Given the approach described above and the focus that this has on aligning stakeholders and their investment if follows that the next levels of detailed planning and design for the targeted areas needs to be prioritised. This needs to occur in terms

of the package of plans approach so as to ensure that land is prepared for development in terms of environmental and planning authorisations.

7.2.5 Enforcing the Urban Development and Development Phasing Lines

The Urban Development Line (UDL) and the Development Phasing Line (DPL) are primary tools for directing both public and private development investment into particular areas so that long term sustainable spatial development objectives can be achieved. They should be implemented in a manner that sends a clear signal to both public and private investors. The UDL provides an urban edge for the long term growth of the Msunduzi area whilst the DPL indicates the initial focus areas for urban development in the short term with a later phase extending from the DPL to the UDL in the medium to long term (see Figure 7-3).

The delineation of the UDL will remain fixed over time, however, the DPL may need to be applied with a degree of flexibility and reviewed when necessary in light of the extension of bulk infrastructure and emerging municipal priorities, for example in relation to housing or economic development projects (see Figure 7-3).

The key objective is to make development on the inside attractive for urban development whilst simultaneously making rural / agricultural development and environmental management viable on the outside of the line. This could be achieved by using a number of tools that could be applied in parallel:

- Restrict urban zonings outside the UDL and match urban zonings to the phasing stage associated with the DPL
- Limit infrastructure expansion into the central and peripheral SEDis areas
- Support agriculture and conservation activities in the central and peripheral SEDis areas outside the UDL/DPL
- Use rates to encourage the appropriate development form in urban, suburban and rural areas

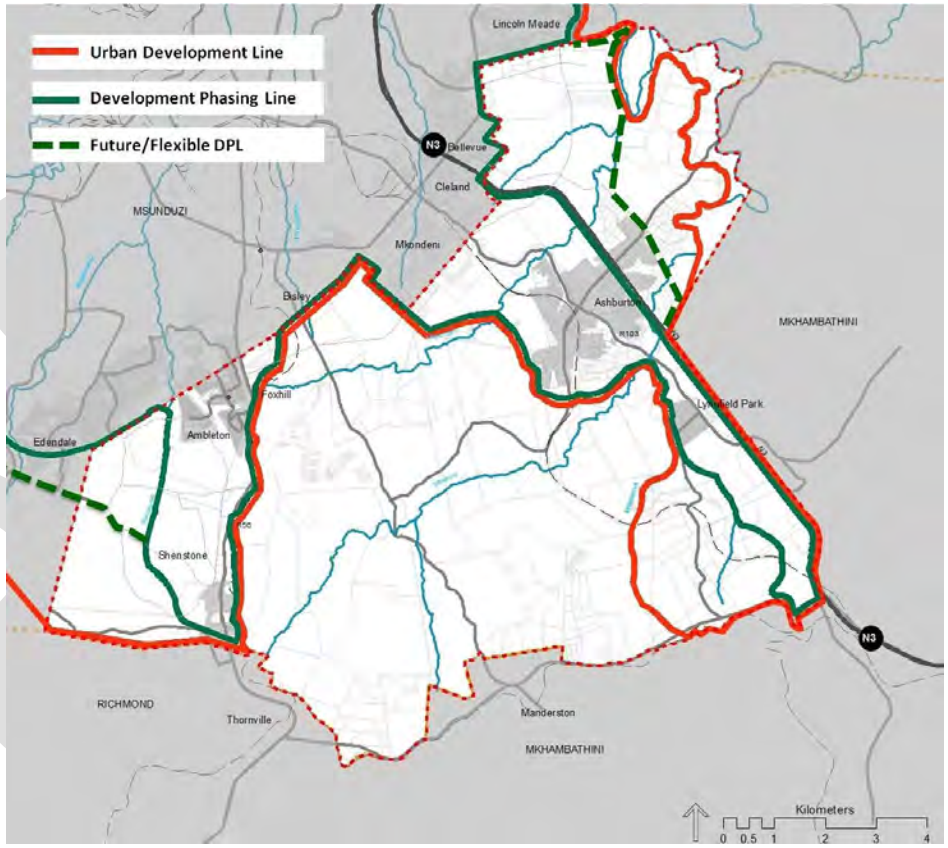


Figure 7-3 : Urban Development Line and Development Phasing Line

7.2.6 Catalytic Projects

The LAP identifies a number of catalytic projects of various sizes and types distributed across and throughout the area that will contribute to achieving the vision and frameworks for the area on an incremental basis. These projects will, however, each be able to catalyse and distribute development and/or management action and delivery and stimulate investment in the broader SEDis area. These projects will contribute to, and indeed enhance, existing development processes or initiatives being undertaken by stakeholders in the area.

Catalytic projects may be described as projects that will be able to initiate change and confidence as well as initiate the creation and identification of additional projects, without necessarily destroying the existing development and energies or positive settlement or landscape qualities prevalent in the area. These catalytic projects will vary with respect to the manner in which they will be implemented and include the following types of interventions:

- Projects that can be **driven** and delivered by the municipality
- Projects that involve significant inputs from other spheres of government and that will need to be **facilitated** by the Municipality
- Projects that involve the involvement of the private sector and/or community and that will need to be **promoted** and supported by the municipality

The projects can be categorised in terms of their applicability to either the whole study area or specifically to the indentified "priority action areas" that have been identified within the study area. The projects with broader study area applicability are particularly important for an overall change since they relate to fundamental contextual issues that are constraining positive change and development or that are undermining investment in the area as a whole.

The LAP has also identified a number of strategic interventions in Section 6.3.2 that can be implemented as key demonstration projects to catalyse development within the SEDis area. These strategic interventions provide a useful outline of the locations and types of demonstration projects that the municipality will need to facilitate and implement within the area. This will need to be supported through more detailed land use, transportation and infrastructure planning for each intervention area, engagement with service providers and local stakeholders, the development of appropriate design and built form proposals and the establishment of an appropriate institutional vehicle to implement, co-ordinate and deliver the project.

7.3 Implementation Plan

A number of strategic interventions across sectors have been identified within SEDis in order to realise the objectives for the development of the area (see Table 7-2 and, where the project has a specific spatial location, Figure 7-4). These interventions are listed and categorised in Table 7-2 in terms of:

- Short Term – immediate to 5 years
- Medium Term – 5 to 10 years
- Long Term – 10 to 20 years

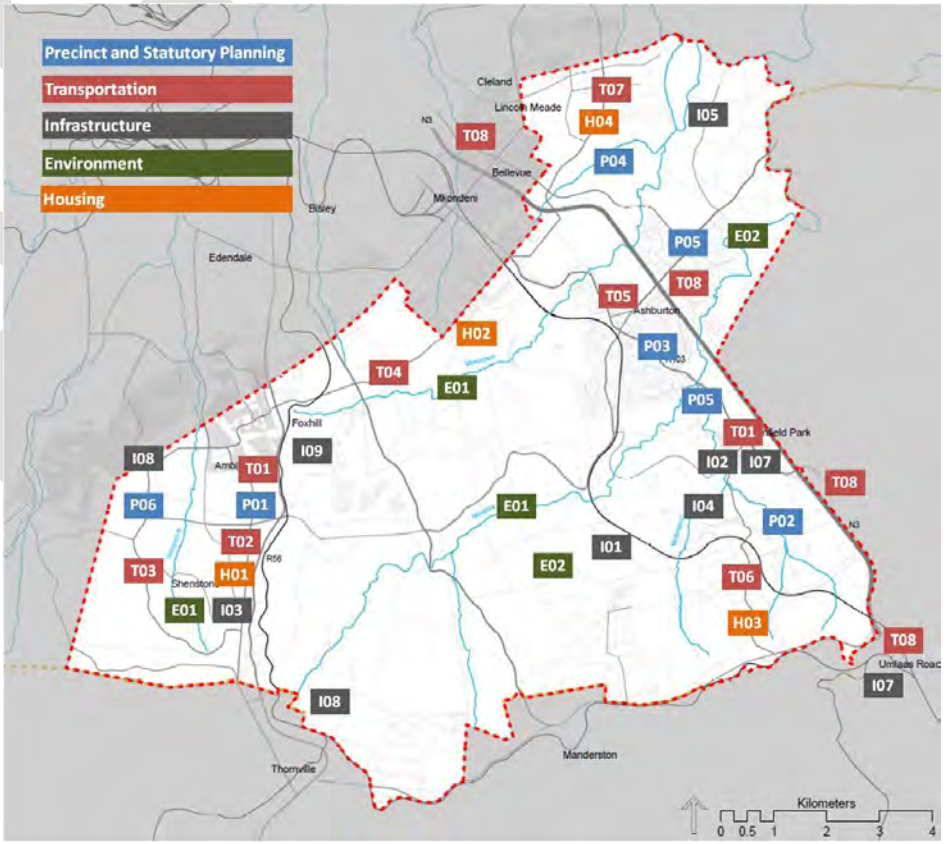


Figure 7-4 : Implementation Plan

The proposed interventions relate to each of the key sectors as follows:

- Precinct and Statutory Planning

- Transportation
- Infrastructure
- Environment
- Housing

7.4 PROJECT FUNDING

The Msunduzi Municipality will need to access existing funding sources and allocate resources from its budget to implement the projects identified for SEDis on a prioritised and targeted basis. The scale of investment required to service the extent of development envisaged for SEDis will also require additional funding sources. Table 7-3 indicates potential funding sources that can be leveraged to fund different types of projects within the SEDis area, such as infrastructure, planning, environment, housing, etc.

Table 7-2 : Implementation Plan

No.	Name	Project Description	Responsibility	Budget Estimate (Rm)	Phasing (S/M/L term)
PRECINCT AND STATUTORY PLANNING					
SED-P01	R56 Richmond Road Precinct Plan	Precinct Plan for the development, consolidation, extension and improvement of the Ambleton/Shenstone primary mixed use node, secondary mixed use nodes and residential areas, including proposals for providing a range of low to middle income housing, developing a new road and street network, providing linkages to Edendale, improving public transport access and NMT infrastructure, developing public spaces, providing community facilities, managing land invasion, etc.	Msunduzi Planning Department	1.2	Short
SED-P02	R103 Lynnfield Park/ Umlaas Road Precinct Plan	Precinct Plan for the development and consolidation of Lynnfield Park, including public realm upgrade along the R103, and residential and industrial expansion south of Lynnfield Park extending to Umlaas Road/Dardenelles Road.	Msunduzi Planning Department	0.8	Short
SED-P03	R103 Ashburton Precinct Plan	Precinct Plan for the development and consolidation of Ashburton, including the realignment of the P478 to remove through traffic from Ashburton, provision of public spaces, development of active/responsive streets and built form, options for densification and waterborne sewerage provision, etc.	Msunduzi Planning Department	0.8	Short
SED-P04	North East Precinct Plan	Precinct Plan for the development of the area east of the N3, including provision of new road linkages, WWTW and sewers, creation of an activity spine, integration with Ashburton North.	Msunduzi Planning Department	0.8	Short
SED-P05	Review of Ashburton/ Lynnfield Park TPS	Review of the Ashburton Town Planning Scheme (TPS) to align with the SEDis LAP and relevant objectives, including the following: • review of the scheme's existing land use and built form controls along the main roads in order to encourage more intensive, mixed use development with active/responsive ground floor uses, reduced building lines, etc. • review of the scheme's existing residential and garden lot zones to ensure consistency with the proposed and future refined open space system for SEDis (refer to project SED-E01)	Msunduzi Planning Department	0.4	Short
SED-P06	Review of Edendale LUF and Extension of Pietermaritzburg TPS to include Greater Edendale	Review of the Edendale Land Use Framework (LUF) (in particular the Shentone and Slangspruit areas of the LUF) and extension of the Pietermaritzburg Town Planning Scheme (TPS) to include Greater Edendale in order to ensure that they align with the SEDis LAP and relevant objectives for the Ambleton and Shenstone areas, including the introduction of: • mixed use zonings in the proposed nodes along R56 Richmond Road and the proposed activity spine • appropriate zoning/s along the proposed activity spine to encourage higher	Msunduzi Planning Department	0.8	Short

No.	Name	Project Description	Responsibility	Budget Estimate (Rm)	Phasing (S/M/L term)
		densities and street facing development with active/responsive ground floor uses and reduced building lines • flexible residential zonings that provide for a mix of housing types and densities • urban agricultural zoning adjoining the open space areas to provide livelihood opportunities and act as a buffer between residential and open space uses			
TRANSPORTATION					
SED-T01	Integrated Rapid Public Transport System	Roll-out of reliable and efficient public transport between key points in the city thereby reducing resident's commuting times. This will include the development of IRPTN corridors with nodes/bus stops along R56 and a new activity spine in Ambleton/Shenstone and along R103 in Ashburton and Lynnfield Park.	Msunduzi Roads and Transport Department	3 200	Short to medium
SED-T02	Ambleton – Shenstone Activity Spine and Bus Route	Planning, design and construction of activity spine linkage road connecting Ambleton to Shenstone and utilising the corridor for Bus Route 7 with bus stops in key nodes.	Msunduzi Roads and Transport Department	40	Short to medium
SED-T03	Ambleton/Shenstone – Edendale Link Roads and Street Network	Planning and design of new link roads connecting Ambleton/Shenstone and R56 to Edendale and a new road/street network serving the expansion of the Ambleton/Shenstone areas.	Msunduzi Roads and Transport Department GEDI	100	Medium to Long
SED-T04	Fox Hill – Shortts Retreat Link Road	Planning, design and construction of a new linkage from Ambleton mixed use node and settlements to employment opportunities in Mkhondeni.	Msunduzi Roads and Transport Department	30	Medium
SED-T05	P478 Realignment	Planning, design and construction of a realignment of the P478 to remove through traffic from Ashburton and support the restructuring of land use patterns, built form and public space in Ashburton.	Msunduzi Roads and Transport Department	10	Medium
SED-T06	D354 Upgrade	Upgrading of D354 to provide suitable alignment and surface to connect Lynnfield Park to Dardenelles Road and provide for the future development of an activity spine along this route.	Msunduzi Roads and Transport Department	20	Medium
SED-T07	Northeast Precinct Link Roads and Street Network	Planning, design and construction of new link roads and a new road/street network serving the connectivity of Msunduzi and the expansion of the northeast precinct, including: • Bellevue Distributor (linking from R103/Cleland, traversing the N3 and northeast precinct to Lincoln Meade) • Hesketh Drive Extension (linking to Bellevue) • Cleland Road Extension (linking to Bellevue and to P478/Ashburton North)	Msunduzi Roads and Transport Department	100	Medium to Long
SED-T08	N3 Interchanges	Upgrade interchanges along the N3 at Umlaas Road, Ashburton, Lynnfield Park and Market Road to serve the operational and capacity requirements of the N3,	SANRAL KZN DoT	TBD	Medium

No.	Name	Project Description	Responsibility	Budget Estimate (Rm)	Phasing (S/M/L term)
		improve access to the R103, Lynnfield Park, Ashburton and Mkhondeni and future residential and industrial developments in SEDis.	Msunduzi Roads and Transport Department		
SED-T09	Traffic Management System	Develop a traffic management system for the major transport corridors, including the N3/R103, Richmond Road and Dardenelles Road, to manage traffic and heavy vehicles, reduce impacts on settlements and amenities and to balance road infrastructure capacity with development and traffic growth.	Msunduzi Roads and Transport Department	TBD	Short to Medium
INFRASTRUCTURE					
SED-I01	61 Pipeline Off-Takes	Off-take and pipelines from 61 pipeline to Richmond and Umlaas Road to serve SEDis, Msunduzi and Richmond municipalities.	Umgeni Water Msunduzi Water and Sanitation Department	240	Short to Medium
SED-I02	Lynnfield Park WWTW	Upgrading and expansion of the treatment capacity of the WWTW to service future development in Lynnfield Park, Ashburton and residential and industrial areas to the south of Lynnfield Park.	Msunduzi Water and Sanitation Department	TBD	Short
SED-I03	Ambleton/Shenstone Sanitation System	Extension of Slangspruit sewers to service Ambleton/Shenstone development.	Msunduzi Water and Sanitation Department	25	Short
SED-I04	Mpushini/Malkopspruit WWTW/Sewers	Development of a waterborne sewerage network serving residential and industrial areas south of Lynnfield Park initially discharging to an upgraded Lynnfield Park WWTW with the potential future of a new WWTW.	Msunduzi Water and Sanitation Department	TBD	Medium
SED-I05	Mkhondeni/Mpushini/ Msunduzi WWTW/ Sewers	Development of a waterborne sewerage network serving future mixed use and residential development east of the N3 pumped to Darvill WWTW or discharging to a new WWTW downstream of development.	Msunduzi Water and Sanitation Department	TBD	Medium to Long
SED-106	Msunduzi Water Savings Programme	Implement a water savings programme in Msunduzi to reduce water losses, which will reduce the demand on water sources and reservoirs and retain/free up capacity to serve development in the SEDis area.	Msunduzi Water and Sanitation Department	TBD	Medium
SED-I07	Eastern Electricity Substations	Upgrading of the Ariadne and Umlaas Road Substations and roll out of the development of new substations at Ranch, Lynnfield Park and Oriole to service development in the eastern parts of SEDis.	Eskom Msunduzi Electricity Department	TBD	Short to Medium
SED-I08	Northern and Western Electricity Network	Extension of the Edendale electricity network (with supplies from Unit P and Azalia Substation) and investigate potential provision of some connections from the 32kV Thornville line and a possible new connection from Ariadne Substation to service development in the northern and western parts of SEDis.	Eskom Msunduzi Electricity Department	TBD	Medium
SED-I09	Richmond Road Cemetery	Planning, design and development of a new cemetery east of Richmond Road to serve Msunduzi Municipality.	Msunduzi Planning Department Parks and Recreation Department	TBD	Short to Medium
ENVIRONMENT					
SED-E01	SEDis Open Space	Refine and update the open space footprint for SEDis as part of the ongoing	Msunduzi	Internal	Short

No.	Name	Project Description	Responsibility	Budget Estimate (Rm)	Phasing (S/M/L term)
	System	work to develop an Environmental Services Plan/open space system for Msunduzi Municipality.	Environmental Management Unit	Resources	
SED-E02	Mpushini SEA and SEMP	Prepare a Strategic Environmental Assessment and Strategic Environmental Management Plan for the Mpushini River catchment to identify conservation and development areas and to provide proposals for managing these conservation areas.	Msunduzi Environmental Management Unit	0.6	Short
SED-E03	Conservation Management Initiative	Develop a joint conservation management initiative between the Environmental Management Unit of Msunduzi Municipality and local conservancy and environmental groups in the Mpushini, Mkhondeni and Slangspruit River catchments to develop a management forum and guidelines to manage conservation areas.	Msunduzi Environmental Management Unit Local Stakeholders	Internal Resources	Short to Medium
SED-E04	Water Quality Monitoring Programme	Develop an ongoing water quality monitoring programme to measure the water quality in the Mpushini and Mkhondeni Rivers.	Msunduzi Water and Sanitation Department and Environmental Management Unit	TBD	Short
HOUSING					
SED-H01	Ambleton/Shenstone Housing Development and Informal Settlement Upgrade	Develop public housing projects and upgrade informal settlements through the provision of public housing, access roads, pedestrian pathways and services. Current housing projects include pre-feasibility, planning, design and construction for Ambleton 3.	Msunduzi Human Settlements Department	TBD	Short
SED-H02	Sakha Informal Settlement Upgrade	Upgrade informal settlement through the provision of public housing, access roads, pedestrian pathways and services.	Msunduzi Human Settlements Department	TBD	Short
SED-H03	R103 Precinct Greenfield Housing Development	Planning, design and development of a mixed income, mixed tenure housing development south of Lynnfield Park with a mix of low income, GAP, middle income and social/rental housing, medium to high densities and support facilities, infrastructure and services.	Msunduzi Human Settlements Department Msunduzi Housing Association	TBD	Medium
SED-H04	Northeast Precinct Greenfield Housing Development	Planning, design and development of a mixed income, mixed tenure housing development south of Lincoln Meade with a mix of low income, GAP, middle income and social/rental housing, medium to high densities and support facilities, infrastructure and services.	Msunduzi Human Settlements Department Msunduzi Housing Association	TBD	Medium

Note: Above budget estimates currently are under review and will be revised if necessary in the final report

Table 7-3 : Project Funding Sources

	FUNDING SOURCES	Planning	Transport and Infrastructure	Water and Sanitation	Housing	Local Economic Development	Environment
NON-GOVERNMENTAL ORGANISATIONS	Independent Development Trust (IDT)	●	●			●	
	Kagiso Trust (KT)					●	
	Mvula Trust			●			
	National Development Agency (NDA)	●				●	
	Urban Sector Network (USN)	●			●		
GOVERNMENT	Department of Agriculture					●	●
	Department of Arts and Culture					●	
	Department of Environmental Affairs and Tourism		●			●	●
	Department of Housing	●	●		●	●	●
	Department of Labour					●	
	Department of Land Affairs	●					
	Department of Minerals and Energy						
	Department of Provincial and Local Government	●	●	●		●	●
	Department of Public Works					●	
	Department of Safety and Security (Secretariat)					●	
	Department of Science and Technology					●	
	Department of Sport and Recreation (SRSA)		●			●	
	Department of Trade and Industry (DTI)					●	
	Department of Transport		●				
	Department of Water Affairs and Forestry (DWAF)		●	●			
	The National Treasury	●				●	

7.5 MONITORING AND REVIEW

The LAP prepared for SEDis is not a blueprint for development and therefore must be able to respond to changing circumstances in order to remain relevant. Such changes include changes within the broader policy environment, development pressures and/or changing political priorities. These changes, however, need to be effected through a co-ordinated monitoring and review system.

Monitoring and review is a process by which the success of the plan is assessed using key performance indicators that measure development trends, the plan is reviewed in light of these, and where necessary amended, or replaced to reflect necessary changes (see Figure 7-5).

Figure 7-5 : Monitoring and Review Process

7.5.1 MONITORING

The monitoring system proposed for the SEDis LAP focuses on:

- ensuring the adoption of the LAP by the Municipality
- the implementation of the LAP and its strategies, policies and projects by both the public and private sectors
- the impact of the plan on achieving its desired effects in terms of the type, form, rate and impact of growth

In order to measure these, the LAP proposes to utilise the Strategic Priorities, Key Performance Areas (KPAs) and Targets identified in the Msunduzi IDP (see Table 7-5 to Table 7-10). This will ensure consistency with the KPAs used for the IDP and allow greater ease of monitoring and cross reference between the LAP and the IDP.

7.5.2 REVIEW

The review of the SEDis LAP is the responsibility of the Msunduzi Planning Department in conjunction with other municipal departments and in consultation with public and private stakeholders. Whilst monitoring is ongoing, the review of the plan should occur every five (5) years. Any form of review must be based on the assessment of the plan according to the KPAs adopted to monitor the LAP.

7.5.3 TOOLS

Monitoring and review requires a number of tools. These include:

- **SEDis Trends Document** – a proposed mid-term (2.5 years) publication which provides statistical information on a range of social, economic and environmental indicators, including development trends, i.e. average annual take-up rates for industrial development, population and employment growth, housing delivery, public transport ridership, modal splits in public transport, changes in income levels, environmental impacts, etc.
- **SEDis Development Database** – a spatial database (GIS) must be developed for the SEDis area that captures where development applications are occurring, what types of development are being applied for, where applications conflict with the plan, number of completed building plans, the level of services and infrastructure provided, etc.
- **Household Travel Survey** – a vital source of information related to vehicle ownership, household travel patterns, origin destination data, etc.
- **Town Planning Schemes** – the town planning schemes in SEDis should be assessed and amended in light of the recommendations of the SEDis LAP concepts

and policies especially with respect to density, form and typology. The extension of schemes into Greenfield areas provides an opportunity to direct the nature of permitted development and prevent development from occurring outside of designated land use areas.

- **Medium Term Expenditure Framework Budget** – ensuring that the budget priorities of various municipal departments within the Municipality align with the proposed infrastructure framework for SEDis will assist in releasing opportunity areas in a co-ordinated manner.
- **Municipal Publications** (website and print media) – the municipal communications department in conjunction with the Planning Department should regularly highlight the SEDis initiative, how the plans to realise the vision for the corridor are being implemented, etc.
- **Forums** – integration between municipal departments, between different spheres of government and private stakeholders is best achieved through continued structured interaction.

The Strategic Objectives, KPAs and Targets for the implementation of the SEDis LAP are outlined in Table 7-5 to Table 7-10.

7.5.4 Project Prioritisation

The Implementation Framework has identified a number of projects that are critical to the successful implementation of the LAP. These projects have the potential to make a significant contribution to the strategic objectives, KPAs and targets for the municipality. Given the shortage of resources to implement projects and the resulting need to prioritise projects, each project has been ranked against the KPAs to indicate which strategic objective they will potentially contribute to, as indicated in Table 7-11.

During the monitoring and review process for the LAP, it may be necessary to review the need for the proposed projects or to consider additional projects that address changing requirements in the SEDis area. The review of existing projects or the introduction of additional projects will need to be assessed against their ability to address the strategic objectives, KPAs and targets outlined in Table 7-5 to Table 7-10. The Project Prioritisation Model set out for the Msunduzi Municipality in the IDP will also provide a useful test for measuring the importance and priority of future projects (see Table 7-4).

Table 7-4 : Project Prioritisation Model for Msunduzi Municipality

CRITERIA	Description	Scoring
Vision 2030 Impact	Will the project realise the Vision Statements, Goals, Value Statements and Targets contained in the Vision 2030 for the Msunduzi municipality?	5 – Yes definitely 3 – Partially 1 – Not at all
Project directly relates to the IDP-identified Catalytic Projects	Will the project result in the implementation of the IDP-identified catalytic projects?	5 – Yes definitely 3 – Partially 1 – Not at all
Community Identification of Project	Has the project been identified by a community through community engagements, Ward Councillor involvement, War Room deliberations, or through a Community Based Plan?	5 – Yes definitely 1 – Not at all
Sector Plan identification of Project	Has the project been identified in a sector-specific plan (i.e. Water Services Development Plan, Local Economic Development Plan)?	5 – Yes definitely 1 – Not at all
Linkage to the Spatial Development Framework	Has the project been aligned to the SDF? Does the project occur within an SDF-identified Node or Corridor?	5 – Yes definitely 3 – Partially 1 – Not at all
Millennium Development Goals Linkage	Does the project assist the municipality and its communities to realise the targets set out in the Millennium Development Goals (MDGs)?	5 – Yes definitely 3 – Partially 1 – Not at all

Table 7-5 : Key Performance Areas – A Well-Serviced City

STRATEGIC PRIORITY	VALUE STATEMENT		TARGET	
1. A WELL-SERVICED CITY	1.1	City-wide infrastructure and service delivery provides a reliable, high quality supply of water, sanitation, energy and waste services – to all.	1.1.1	100% of all households have a municipal water connection to the yard level.
			1.1.2	70% of all households have water-borne sanitation.
			1.1.3	30% of all households have the basic minimum of VIPs.
			1.1.4	To Reduce Non-Revenue Water and Real Water Losses to 20% and 15% respectively.
			1.1.5	To reduce the amount of Water Service interruptions from 1684 per annum (2011/2012) by 80% (to 336 bursts) per annum and respond to 100% of service interruptions within 8 hours.
			1.1.6	To reduce Sanitation service interruptions from 2499 (2011-2012) per annum by 80% (500) per annum and respond to 100% of sanitation blockages within 8 hours.
	1.2	City-wide energy infrastructure and service delivery provides a reliable, high quality supply of energy. Energy supply meets the anticipated increased demand for electricity specifically, including peak periods.	1.2.1	Disruption to energy supply is minimised to 6 hours in 100% of incidents.
			1.2.2	Electricity supply keeps pace with expected growth of 4% per annum.
			1.2.3	100% of households have basic electricity supply.
	1.3	Energy prices are affordable for residents.	1.3.1	100% of municipal households are fitted with solar water heating geysers.
	1.4	Use of renewable sources of energy is widespread.	1.4.1	100% of street lights and 100% of traffic signals in the CBD are powered by renewable energy.
	1.5	Energy production, capacity, storage, management and distribution rapidly adapts to changing patterns of demand.	1.5.1	Demand management provides a 10% reduction in peak demand.
	1.6	City-wide infrastructure and service delivery provides reduced electricity losses.	1.6.1	Reduces electricity losses to below 5% of bulk supply purchases.
	1.7	Municipal-wide waste collection and disposal services to domestic households are available to all Msunduzi residents.	1.7.1	100% of households are rendered a waste collection and disposal service once a week.
	1.8	Appropriate waste collection and disposal services are provided to support business and industry. Commercial activity derives production inputs from recovered waste material.	1.8.1	100% of businesses are rendered a waste collection and disposal service at least twice a week.
	1.9	Implementation of Advanced Waste Management Systems that reflect community values around waste minimisation.	1.9.1	50% recovery rate of recyclable materials through source separation at households and public sector offices, and treatment of organic waste.
	1.10	Implementation of annual infrastructure	1.10.1	Construct waste containment berms, access roads, rehabilitation of perimeter roads,

		upgrade of the waste disposal site.		fencing of perimeter of site, construct wet-weather facility, install stone drainage layers on site, clay-cap side slopes of berms.
	1.11	Recovery, re-use and recycling of waste is maximised. The volume of waste disposed to landfill is minimised. Life spans of landfill sites are extended.	1.11.1	25% of household and business waste is sorted on-site.

Table 7-6 : Key Performance Areas – An Accessible and Connected City

STRATEGIC PRIORITY	VALUE STATEMENT		TARGET	
2. AN ACCESSIBLE AND CONNECTED CITY	2.1	A diversity of private (cars, bikes, walking) and public (trains, buses, taxis) transport options, using a range of adequate physical infrastructure (roads, rail and bikeways / walkways) is readily available to all residents.	2.1.1	Road and rail infrastructure backlogs are reduced such that 90% of communities have access to road and rail services.
			2.1.2	100% compliant with Roads infrastructure management plan.
			2.1.3	90% of Msunduzi residents can get to work within 45 minutes.
			2.1.4	Reliable Public transport services are available 24 hours per day, with accessibility every 15 minutes to key activity nodes.
			2.1.5	90% of travel in morning peak periods comprise walking, cycling or energy efficient public transport.
	2.2	Housing backlogs are significantly reduced with human settlement patterns reflecting inclusive demographics.	2.2.1	100% eradication of informal settlements.
			2.2.2	Rural Residential housing infrastructure backlogs are reduced such that less than 10% of households remain without access to formal housing.
			2.2.3	Zero tolerance for exclusions based on racial, ethnic, religious or other demographic characteristics, is reflected in 100% of new settlement patterns.
			2.2.4	20% of each new mixed-use development consists of rental stock.
			2.2.5	30% densification of urban space.
			2.2.6	Council Rental Stock maintained on a regular and consistent basis to eliminate unsafe structures and to prevent deterioration of Council's assets.
			2.2.7	Old Rental Stock to be reduced by transferring certain units to qualifying tenants.
			2.2.8	Allocations of new houses in subsidised housing projects to be 100% compliant with DOHS policies by installation of Housing Needs Register and capture of names.
	2.3	People connect virtually through highspeed information and communication technology. Reliable telecommunications networks provide access to learning and information opportunities in homes, schools and workplaces. Business and industry embrace high-speed broadband networks to become more productive and innovative. Energy	2.3.1	90% of households have access to telecommunications and high-speed broadband more cheaply and cost effectively
			2.3.2	100% of indigent households have free access to telecommunications and high-speed broadband.
			2.3.3	100% of businesses, government departments and schools have easy access to business-grade and bi-directional highspeed broadband.
			2.3.4	Telecommuting reduces conventional energy usage by 20%.

		efficiency is promoted by telecommuting.		
	2.4	Social infrastructure supports healthy lifestyles, learning opportunities and community unity and social cohesion. Health infrastructure is readily available and meets community needs. Major recreational infrastructure (e.g. sports stadia, cultural facilities, etc.) contribute to the city's economy by allowing for world-class events and tourism. Social infrastructure is delivered with regard to minimising impacts on the environment.	2.4.1	90% of communities have adequate social infrastructure within a 30 minute walk or ride.
			2.4.2	100% of business centres are supported with appropriate community recreational and meeting facilities including health and educational facilities.
			2.4.3	100% of social infrastructure delivery complies with national standards regarding minimal environmental impact.

Table 7-7 : Key Performance Areas – A Clean, Green City

STRATEGIC PRIORITY	VALUE STATEMENT		TARGET	
3. A CLEAN, GREEN CITY	3.1	Msunduzi has widespread use for renewable energy supplies, including but not limited to: solar, wind and hydro power. The city continually increases investment in delivering more sustainable energy technologies. Businesses use energy efficiently prioritising low carbon emission sources. Alternative energy sources are mainstreamed in new human settlement development for all communities and energy efficiency required in building plans.	3.1.1	30% of Msunduzi's electricity demand is met by renewable sources.
			3.1.2	20% of liquid energy is derived from bio-fuel.
			3.1.3	50% of new commercial or industrial development incorporates some form of renewable energy technology usage in its design and construction.
			3.1.4	80% of new human settlement development incorporates some form of renewable energy technology usage in its design and construction.
			3.1.5	100% of building plans approved have due consideration for energy efficiency.
	3.2	Communities benefit from a linked public open space network providing for a range of sporting, cultural and recreational uses.	3.2.1	100% of residents are within a 15 minute walking distance to facilities within the city's public, open and green space network.
	3.3	Urban renewal and greening is recognised by communities and the business fraternity as contributing to environmental and ecological sustainability as well as supporting future residential, commercial and industrial development.	3.3.1	100% residential, commercial and industrial precincts incorporate green spaces.
			3.3.2	100% of roads in former black townships and major arterial roads in rural areas are tarred.
			3.3.3	100% compliance with trading bylaws within the CBD.
			3.3.4	100% compliance with environmental bylaws within the city environs.

Table 7-8 : Key Performance Areas – A Friendly, Safe City

STRATEGIC PRIORITY	VALUE STATEMENT	TARGET
4. A FRIENDLY, SAFE CITY	4.1 Separate development of the past will be forgotten as the city proactively promotes and practically engineers social cohesion across all its objectives, geographic spread, racial groupings, class identities, religious formations and political affiliations.	4.1.1 Civic engagement increases so that 100% of residents, regardless of racial, class, religious or political categories can enjoy an active role in decisions that affect their city.
		4.1.2 To ensure the effective management of land uses within the Msunduzi Municipality.
	4.2 People will enjoy working together and helping each other in local neighbourhoods and in the broader community. Msunduzi's friendly, outdoor life is enlivened by an interesting range of local and regional celebrations.	- -
	4.3 Civil society organisations and community participation are critical elements of Msunduzi's safety and security strategies. Community policing forums are active in community safety centres established across the city.	4.3.1 80% of community police forums are accessible and accommodated in safety centres within a 30 minute walk or ride for all residents.
		4.3.2 The entire Msunduzi Municipal area is monitored through CCTV camera system.
		4.3.3 100% of the city-wide area is monitored by law enforcement officials (traffic wardens, traffic officers, security officers, city police, peace officers and inspectors).

Table 7-9 : Key Performance Areas – An Economically Prosperous City

STRATEGIC PRIORITY	VALUE STATEMENT	TARGET
5. AN ECONOMICALLY PROSPEROUS CITY	5.1 The city absorbs young people into a job creation social compact between the council, private businesses and the non-profit sector – with the support of institutions of learning.	5.1.1 Unemployment in the city is reduced to 15%.
	5.2 By 2030 Msunduzi will have a strong, diversified and resilient economy, using its competitive advantages to deliver prosperity, high employment and quality jobs for all the city's residents.	5.2.1 The Municipality has competitive business incentive packages to attract new businesses and expansion.
		5.2.2 The municipality attracts annual investment in excess of R 1 billion per annum, reducing unemployment by 5% per annum.
		5.2.3 Municipality has 100% of skills required for the local economy.
		5.2.4 Reduce the percentage of economically inactive youth to 5%.

Table 7-10 : Key Performance Areas – A Financially Viable and Well-Governed City

STRATEGIC PRIORITY	VALUE STATEMENT	TARGET
6. A FINANCIALLY VIABLE AND WELL-GOVERNED CITY	6.1 BY 2030 Msunduzi will be financially sound through managing its finances efficiently through effective and realistic budgeting to ensure synergy between the capital and operating budget, as well as revenue enhancement.	6.1.1 Efficient Budget and Treasury.
		6.1.2 Optimal Expenditure Management
		6.1.3 Improved Revenue Management.
		6.1.4 Effective Supply Chain Management.
		6.1.5 Optimal Financial Service.
		6.1.6 Efficient collection of revenue through Municipal Property Rates.
	6.2 By 2030 Msunduzi will have a civil society that actively participates in and contributes to sound decision making ensuring greater accountability of Councillors and Officials.	6.2.1 100% effective administration complying with its legal mandates.
		6.2.2 Effective fleet management to ensure resource availability for service delivery.
		6.2.3 To maximize the disaster resilience of Msunduzi through coordination of all pre-disaster risk reduction – as well as post disaster response activities within a framework of sustainable development.

Table 7-11 : Contribution of LAP Projects to City's Key Performance Areas

No.	Project Name	A Well-Serviced City	An Accessible, Connected City	A Clean, Green City	A Friendly, Safe City	An Economically Prosperous City	A Financially Viable and Well-Governed City
PRECINCT AND STATUTORY PLANNING							
SED-P01	R56 Richmond Road Precinct Plan	●	●	●	●	●	
SED-P02	R103 Lynnfield Park/Umlaas Road Precinct Plan	●	●	●	●	●	●
SED-P03	R103 Ashburton Precinct Plan	●	●	●	●		
SED-P04	North East Precinct Plan	●	●	●	●	●	
SED-P05	Review of Ashburton/Lynnfield Park TPS						●
SED-P06	Review of Edendale LUF and Extension of Pietermaritzburg TPS to include Greater Edendale						●
TRANSPORTATION							
SED-T01	Integrated Rapid Public Transport System		●	●	●	●	●
SED-T02	Ambleton – Shenstone Activity Spine and Bus Route		●	●	●		
SED-T03	Ambleton/Shenstone – Edendale Link Roads and Street Network		●		●	●	
SED-T04	Fox Hill – Shortts Retreat Link Road		●			●	
SED-T05	P478 Realignment		●				
SED-T06	D354 Upgrade		●				
SED-T07	Northeast Precinct Link Roads and Street Network		●		●	●	
SED-T08	N3 Interchanges		●			●	

No.	Project Name	A Well-Serviced City	An Accessible, Connected City	A Clean, Green City	A Friendly, Safe City	An Economically Prosperous City	A Financially Viable and Well-Governed City
SED-T09	Traffic Management System		●	●	●		
INFRASTRUCTURE							
SED-I01	61 Pipeline Off-Takes	●				●	●
SED-I02	Lynnfield Park WWTW	●		●			
SED-I03	Ambleton/Shenstone Sanitation System	●		●			
SED-I04	Mpushini/Malkopspruit WWTW/Sewers	●		●		●	
SED-I05	Mkhondeni/Mpushini/Msunduzi WWTW/Sewers	●		●		●	
SED-106	Msunduzi Water Savings Programme	●		●			
SED-I07	Eastern Electricity Substations	●				●	●
SED-I08	Northern and Western Electricity Network	●					
SED-I09	Richmond Road Cemetery	●	●				
ENVIRONMENT							
SED-E01	SEDis Open Space System	●	●	●	●		
SED-E02	Mpushini SEA and SEMP			●			
SED-E03	Conservation Management Initiative			●	●		
SED-E04	Water Quality Monitoring Programme	●		●			
HOUSING							
SED-H01	Ambleton/Shenstone Housing Development and Informal Settlement Upgrade	●	●	●	●		
SED-H02	Sakha Informal Settlement Upgrade	●	●	●	●		
SED-H03	R103 Precinct Greenfield Housing Development		●		●		
SED-H04	Northeast Precinct Greenfield Housing Development		●		●		

8 APPENDICES

8.1 OPEN SPACE SYSTEM METHODOLOGY

The key data sources and methodology that have been used to identify the open space system (OSS) for the SEDis area are outlined below. It should be noted that this is a preliminary delineation of the open space system and that current environmental initiatives by Msunduzi Municipality, together with additional work in the SEDis area and future project level environmental assessments and management plans, will be necessary to refine this open space footprint at a more detailed level.

Key Data Sources:	
National	• National Strategy for Sustainable Development and Action Plan, 2011 • National Protected Areas Expansion Strategy for South Africa, 2008 • SANBI Threatened Ecosystems in South Africa, 2012 • SANBI National Freshwater Ecosystem Priority Areas 2011
Provincial	• KZN DAEA Landcover 2008 • KZN C-Plan
District	• uMgungundlovu SEA, 2012
Local Municipal	• Msunduzi EMF • Msunduzi SEMP • Msunduzi Draft ESP/MOSS • Msunduzi Draft SEA
Local	• Mkhondeni SEA • Mpushini SEA • Ashburton TPS and Structure Plan
Project	• Hilcove Hills EIA • Burton Heights EIA • Ibubhezi EIA • Almond Bank (Ntaba Ridge) EMP

Data/Layers included/considered in delineating OSS Footprint:	
General	• Protected Areas • Watercourses, Waterbodies and Wetlands • Buffers to Watercourses, Waterbodies and Wetlands (32m) • Significant Areas of Steep Slopes (>1:3) associated with OSS • Msunduzi C-Plan Irreplaceable Areas (Priority 1-3) • Archaeological Sites within OSS
Mkhondeni Catchment	• Open Space land use in Mkhondeni SEA • Conservation Areas in Hilcove Hills EIA • Conservation Areas in Burton Heights EIA • Conservation Areas in Almond Banks EMP
Mpushini Catchment	• Watercourses in Mpushini SEA
Aerial Photography/ Land Cover	• Cultivated Lands and Settled/Developed Lands excluded from OSS Footprint

Data/Layers excluded from OSS Footprint but included in (Spatial) Management Layer:	
General	• Significant Areas of Steep Slopes (>1:3) not associated with OSS • Msunduzi C-Plan Irreplaceable Areas (Priority 4) • Archaeology Sites outside OSS
Mkhondeni Catchment	• Conservation with Development land use in Mkhondeni SEA
Mpushini Catchment	• Grassland, Wooded Grassland, Bushland, Bushland Thicket in Mpushini SEA
Aerial Photography/ Land Cover	• Cultivated Lands and Settled/Developed Lands excluded from Management Layer

Data/Layers excluded from OSS Footprint but included in (Policy) Management Layer:	
Flora	• Habitat Types
Fauna	• Endemic Species
Geology	• Geologically Unstable Areas • Faultlines

Future Data/Layers to be included in OSS/Management Layer:	
General	• Incorporate Open Space/Conservation Areas from Future

	SEAs/EIAs
Mkhondeni Catchment	• Incorporate Open Space/Conservation Areas from Future EIAs
Mpushini Catchment	• Incorporate Open Space/Conservation Areas from Future SEA/EIAs
Slangspruit Catchment	• Incorporate Open Space/Conservation Areas from Future SEA/EIAs
Foxhill Spruit/ Blackborough Spruit Catchments	• Incorporate Open Space/Conservation Areas from Future EIAs

8.2 Population Growth Scenarios

Table 8-1 provides an indication of the assumptions and estimates for population growth for Msunduzi and SEDis for the periods 2011-2026, 2026-2036 and 2011-2036 and the associated demands for residential development land.

8.3 Land Use Schedule and Yields

Table 8-2 indicates the land use schedule derived from the Land Use and Activity Framework and estimates of the potential yield based on a number of assumptions regarding the development potential, density and residential component of future growth.

8.4 Community Facilities Guidelines

Table 8-3 provides an indication of some of the standards used for the provision of community facilities. These guidelines are subject to review, and should be used in conjunction with more detailed planning in consultation between the Msunduzi Municipality and the relevant service provider, where applicable, to determine the social facility needs for the area.

Table 8-1 : Population Growth 2011-2036

Population Growth 2011-2036	Base	2011-2026			2026-2036			2011-2036		
	2011	Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3	Scenario 1	Scenario 2	Scenario 3
Msunduzi Growth Rate	1.12%	1.12%	1.74%	2.50%	1.12%	1.74%	2.50%	1.12%	1.74%	2.50%
Msunduzi Population	618 536	731 260	801 493	895 825	817 603	952 627	1 146 731	817 603	952 627	1 146 731
Msunduzi Population Change	0	112 724	182 957	277 289	86 344	151 134	250 907	199 067	334 091	528 195
SEDis Share of Msunduzi Population Growth	2.56%	10.00%	10.00%	10.00%	15.00%	15.00%	15.00%	10% & 15%	10% & 15%	10% & 15%
SEDis Population	15 864	27 136	34 160	43 593	40 088	56 830	81 229	40 088	56 830	81 229
SEDis Population Change	0	11 272	18 296	27 729	12 952	22 670	37 636	24 224	40 966	65 365
SEDis Average Dwelling Occupancy Ratio (pop/du)	3.6	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
SEDis Total Dwellling Units	4 407	7 627	9 634	12 329	11 328	16 111	23 082	11 328	16 111	23 082
SEDis Dwelling Unit Change	0	3 221	5 227	7 923	3 700	6 477	10 753	6 921	11 705	18 676
Land Demand (ha) for Low Density (10du/ha)	0	322	523	792	370	648	1 075	692	1 170	1 868
Land Demand (ha) for Medium Density (25du/ha)	0	129	209	317	148	259	430	277	468	747
Land Demand (ha) for High Density (50du/ha)	0	64	105	158	74	130	215	138	234	374

Table 8-2 : Land Use Schedule and Yields

Land Use	Total Area (ha)	% Developable	Developable Area (ha)	Density (FAR)	Floor Area (m^2)	Residential Component	Dwelling Units	Height (Storeys)
Existing Settlement and Infill/ Consolidation	715ha	10%	72ha	0.5	357 710	50% res @ 25du/ha	894	1 to 4
Informal Settlement Upgrade	22ha	40%	9ha	0.5	44 840	75% res @ 25du/ha	168	1 to 2
Settlement Growth and Consolidation (Short Term)	643ha	70%	450	0.5	2 251 795	75% res @ 25du/ha	8 444	1 to 4
Settlement Growth Potential (Medium Term)	1 012	70%	708	0.5	3 541 111	75% res @ 25du/ha	13 279	1 to 3
Settlement Growth Potential (Long Term)	783	70%	548	0.5	2 740 095	75% res @ 25du/ha	10 275	1 to 3
Sub-Total for Urban/Residential Settlement Uses	3 176	56%	1 787	–	8 935 551	–	33 061	–
Existing Industrial	51	10%	5	0.5	25 390	0% res	0	1 to 2
Proposed Economic/Industrial Development (Short to Medium Term)	341	70%	239	0.5	1 194 479	0% res	0	2 to 3
Proposed Economic/Industrial Development (Medium to Long Term)	181	70%	127	0.5	634 585	0% res	0	2 to 3
Emerging Services/Mixed Use Development	211	40%	84	0.5	421 760	0% res	0	2 to 3
Sub-Total for Economic/Mixed Uses	784	58%	455	–	2 276 214	–	0	–
Rural Settlement/Agri-Industry/ Agriculture	1 265	5%	63	0.1	63 233	25% res @ 10du/ha	158	1 to 2
Rural/Agricultural/Tourism	2 369	2%	47	0.1	47 389	25% res @ 5du/ha	59	1 to 2
Agricultural Research	287	2%	6	0.1	5 747	0% res	0	1 to 2
Sub-Total for Rural/Agricultural/ Tourism Uses	3 921	3%	116	–	116 369	–	217	–
Open Space/Conservation	3 588	0%	0	0	0	0% res	0	–
Transport/Remainder	25	0%	0	0	0	0% res	0	–
TOTAL	**11 494**	21%	**2 359**	–	**11 328 134**	–	**33 278**	–

Notes:

1. Above figures based on broad level calculations and likely overall average densities and do not represent density guidelines for the various settlements within SEDis. Densities in specific settlement areas will vary depending on the local context, service levels available, etc.
2. % Developable estimated by excluding lands with existing development and assuming 30% of undeveloped lands will be subject to development constraints, transport and infrastructure requirements, etc.

Table 8-3 : Community Facilities Guidelines

Facilities	Standards (Facility/Population)	Source	Min Size	Max Access Distance	Location Criteria	Clustering	Comments
EDUCATIONAL FACILITIES							
Crèche	1 per 5,000 people	KZN PPDC	0.4ha	750m	Predominantly residential areas or places employment & on route taken by older children walking to school.	Community Centres	
Primary School	1 per 3,000-4,000 people	KZN PPDC & KZN DoE	2.8ha	1,500m	Close to public transport & located near to but not on main roads (block or two back); ideally accessible by foot; in rural areas may be required to walk further distances.	Library; crèche; secondary school; community hall; local sports fields (incl. multipurpose outdoor courts); community parks; swimming pool; urban agriculture; primary health care centre; religious centre.	Alternative (KZN PPDC):2.4 ha (1.4ha buildings + 1 ha recreational space).
Secondary School	1 per 6,000-10,000 people	KZN PPDC & KZN DoE	4.8ha	2,250m	Close to public transport & located near to but not on main roads (block or two back); ideally accessible by foot; in rural areas may be required to walk further distances.	Library; primary school; tertiary education facilities; community hall; sports stadium; local sports fields (incl. multipurpose outdoor courts); metropolitan & district parks; swimming pool; urban agriculture; primary health care centre; religious centre; hall may be shared with municipality if within walking distance from school.	Alternative (KZN PPDC): Min 1.5ha (buildings + playground); standard size 4.6ha including all facilities.
HEALTH FACILITIES							
Mobile Clinic	1 per 900du (3,150 people)	Behrens & Watson	NA	1,000m	Should be within close walking distance of population served.		Temporary service.
Satellite Clinic	1 per 10,000-20,000 people	eThekwini Social Facilities Accessibility Model (CSIR, 2006 & 2008)	0.25ha	250m	Should be within 5 minutes walk from public transport stop and/or near public transport interchanges & main thoroughfares.	Primary & secondary schools; tertiary education facilities; community hall; indoor sports hall; local sports fields (incl. multipurpose outdoor courts); community & district parks; urban agriculture; L1 hospital.	Alternative: Clustered 1 per 5 000 people (KZN PPDC).
Community Health Centre	1 per 70,000-100,000 people	KZN PPDC	4.5ha				Library, primary & secondary schools; tertiary education facilities; community hall; indoor sports hall; community & district parks; L1 hospital
Hospital	1 per 450,000 people (L1) 1 per 1,000,000 people (L2) 1 per 4,500,000 people (L3)	CSIR 2011	5ha (L1) 7ha (L2) 35ha (L3)				
SOCIAL FACILITIES							
Community Facility Sites	1 per 500-1,000du (2,625 people)	KZN PPDC	0.2ha		Preferably on or near public transport routes, adjacent to other facilities or open space with which could be consolidated if site not developed as community facility.		(A reserved site to be allocated to any community facility at the discretion of the municipality) 1 per 500 to 1 000 units in denser areas (Minimum 2 000m^2) Useful for smaller social facilities (e.g. crèches, small clinics, worship centres,

Facilities	Standards (Facility/Population)	Source	Min Size	Max Access Distance	Location Criteria	Clustering	Comments
							small halls, post boxes) when it's difficult to forecast future population in an area but important to reserve land.
Community Hall	1 per 20,000 people	eThekwini Social Facilities Accessibility Model (CSIR, 2006 & 2008)	0.25ha		Near public transport stops/ interchanges & on main transport routes; access by delivery vehicles required. In local urban node & close to shops or shops included on the premises.	Other community facilities such as library; primary & secondary schools; tertiary education facilities; indoor sports hall; sports stadium; local sports fields (incl. multipurpose	1 per 15 000-30 000 people.
Mobile Library	1 per 2,000 people	Behrens & Watson		1,000m	Where community activities occur (such as within community centres or civic centres) & near or in shopping centres & on main public transport routes in urban nodes. Near schools as Increasing importance as study place for learners after school.	Primary & secondary schools; tertiary education facilities; community hall; community park; religious sites, civic centre or town hall, municipal offices.	
Library	1 per 10,000 people	KZN PPDC & Red Book	0.5ha	2,250m	Where community activities occur (such as within community centres or civic centres) & near or in shopping centres & on main public transport routes in urban nodes. Near schools as Increasing importance as study place for learners after school.	Primary & secondary schools; tertiary education facilities; community hall; community park; religious sites, civic centre or town hall, municipal offices.	Alternative: 5 000 – 50 000 people (Red Book); 1 per 1800 du (Behrens & Watson).
Old Age Home/ Welfare	1 per 5,000 sites (17,500 people)		1ha				
Worship	1 per 2,000 people	KZN PPDC & eThekwini Social Facilities Accessibility Model (CSIR, 2006 & 2008)	0.15ha		Central and near to but not on public transport routes. With business and institutional uses excluding entertainment, liquor, etc. At central edge of neighbourhood.	Other public facilities to promote multi-functionality. Library; primary & secondary schools; community hall; community park.	
Cemetery	1 per 100,000 people (regional demand) Formulae to calculate cemetery size: Step 1 E = A/1 x B/1,000; Step 2 X = B1 x C x D1; Step 3 Y = B2 x C x D2; Step 4 Z = X + Y	CSIR 2011 KZN PPDC	15-20ha		A = Total population for which cemetery is planned; B = Average amount of deaths per 1 000 of population per year; B1 = 40% of total deaths of children; B2 = 60% of total deaths of people over 10 years of age; C = a minimum of 30 years; D1 = 2,37 m2 being gross area of grave for children; D2 = 5,33 m2 being gross area of grave for adults; X = need for graves of children; Y = need for graves for adults; Z = total area needed for cemetery Gross areas, including pathways, etc:	Critically dependent on hydrological & geological factors; consider strengthening connection between cemetery and community & breaking down the scale of the cemetery (may help to overcome issues relating to private, on-site burials).	L1 Hospital; police station; fire station; nature conservation area as eco-cemetery or combined with botanical gardens (e.g. Canada); If cemeteries can be incorporated into parkland or as eco-cemeteries within conservation areas then could form part of usable Open Space provision. Alternate standard is 1 per 100,000 people.

Facilities	Standards (Facility/Population)	Source	Min Size	Max Access Distance	Location Criteria	Clustering	Comments
					eThekwini Municipality uses as standard grave site size of 2,4m^2 x 1,1m^2.		
PUBLIC SERVICE AND CIVIC FACILITIES							
Fire Station	1 per 100,000 people						
Police Station	1 per 4,500du (15 750 people)	Behrens & Watson	0.5ha	5,000m			Alternative: 60 000 people (de facto) eThekwini Social Facilities Accessibility Model (CSIR, 2006 & 2008).
Post Office	1 per 10,000 people	eThekwini Social Facilities Accessibility Model (CSIR, 2006 & 2008)	0.5ha	1,000m	Cluster post boxes in highly accessible location within residential areas. Prefer site in urban node or shopping centre; good access from main transport routes; visible to public with disabled access.	Business & shopping centres near civic centres, municipal offices and other social institutions/ facilities (e.g. pension pay-points & community centres).	Shop size 80-100m^2 / land 200m^2; 500m^2 if stand-alone facility.
CULTURAL OPEN SPACES							
Food Gardens	1 per 6,000 people	eThekwini Social Facilities Accessibility Model (CSIR, 2006 & 2008)	0.15ha		As close as possible to residential areas where the need exists or travelling and security purposes; close to planned sports fields, parks, etc. to minimise possible fencing costs (garden can latch onto existing fencing); close to rivers which are natural resources for irrigation; under power-line servitudes where these activities are protected from competing land uses (e.g. housing); public open spaces in poor areas often become dumping grounds for domestic rubble – these are potential garden sites.	Natural Conservation Area; secondary schools; tertiary education institutions; community hall; primary health care centre; smaller community & district parks; sports fields near potential market spaces.	Close proximity to homes of the gardeners; ideally less than 200m away for surveillance purposes & transport of produce or at least within easy walking distance.
Market -Trading Spaces	1 per 5,000 people	eThekwini Social Facilities Accessibility Model (CSIR, 2006 & 2008)	0.4ha	4,000m	Accessible by public or private transport. Usually on the side of major internal roads or close to public transport ranks & interchanges. At designated market/ business areas/ zones (informal trading sites, business hives, etc.).		
SPORTS AND RECREATION AMENITIES							
Sports fields	1 per 7,700 - 12,000 people	Cato Manor Structure Plan; KZN PPDC & eThekwini Social Facilities Accessibility Model (CSIR, 2006 & 2008)	1.5ha	300m from school buildings or 500 - 2,000m for bigger complex	In lower income area where public fields are shared with schools should try to provide 1 field per 3 Primary Schools or 12,000 people.	Larger competitive sports fields within clusters of schools, close to private sports clubs & public transport services. Can be located in flood lines, as long as all the buildings are outside the hundred year flood line.	Primary & secondary schools; tertiary education institution; community hall; indoor sports hall; sports stadium; district & community parks; swimming pool.
Play Areas	1 per 2,500 people		0.1ha				