Local Area Plans:

**NORTHERN URBAN DEVELOPMENT CORRIDOR**

Ethekwini Municipality

Spatial Concept for the NUDC

**Final**

Contract No: DPU/FPB 0005
**SYNOPSIS:**
Description of a proposed refined spatial concept for the Northern Urban Development Corridor

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**Spatial Concept for the NUDC**
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**Ethekwini Municipality**

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1 INTRODUCTION

1.1 Background

The Ethekwini Municipality initiated the Northern Urban Development Corridor (NUDC) Study as part of its roll out of the further planning and implementation strategy of the Northern Spatial Development Plan which was approved by the Municipality in 2009. The corridor project was conceptualised in an initiative called:

“The Basic Planning of Alternative Route Alignments of the R102 Including Linkages to Dube Trade Port; and Local Area Development Plans for the Northern Ethekwini Urban Development Corridor” (CONTRACT NO: DPU/FPB 0005).

Local area Plans (LAP's) are to be prepared for three areas named as follows:

- Phoenix-INK (i.e. Inanda, Ntuzuma, KwaMashu)
- Verulam-Cornubia
- Tongaat-Dube Trade Port

The NUDC Spatial Concept should be read in conjunction with these project reports:

- NUDC: Strategic Assessment, and associated sector reports (November 2009)
- NUDC: Generating Development Scenarios (March 2010)
- NUDC: Phoenix-INK Local Area Plan (November 2010)
- NUDC: Verulam-Cornubia Local Area Plan (November 2010)
- NUDC: Tongaat-DTP Local Area Plan (November 2010)
- NUDC: Transportation Framework for the NUDC, including Technical Analysis and Assessment of Logistical Requirements of the “Aerotropolis Concept” for Dube Trade Port King Shaka International Airport (November 2010)
- NUDC: R102: King Shaka International Airport-Tongaat - Basic Planning (November 2010)
- NUDC: Stakeholders Engagement Report (November 2010)

1.2 Purpose of this Document

The purpose of this document is to describe the spatial development strategies and concepts for the Northern Urban Development Corridor (NUDC) in order to guide the preparation of three more detailed local area plans (LAPs).

Accordingly, this document presents a preferred “ultimate” (i.e. long term +50 years) spatial development concept which has been based on the findings of the Strategic Assessment (Phase 1 on the NUDC Project), an understanding and quantification of the demographic and economic projections for the corridor, interactions with the Ethekwini Municipality (EM) stakeholders, the NUDC Project Steering Committee, key stakeholders consulted in the corridor to date and outputs from the transportation and infrastructure modelling phases of the project.

1.3 Emerging Spatial Structure of Ethekwini

The spatial structure of the Ethekwini Municipality Area (EMA) is changing. Whereas previously the structure was focused primarily around the CBD, the Port and related South Durban Basin and the Pinetown New Germany hubs, the structure is reforming and new key strategic zones/hubs are emerging on the outskirts of the Municipality. The new King Shaka Airport and Dube Trade Port have established themselves in the north and Cato Ridge in the west is growing in importance (Figure 1-1).

These emerging zones/hubs have strategic significance to the City in that they are major drivers and locations of economic growth and employment creation and play an important role in the logistics platform of the EM and the national logistics platform for South Africa. Each has a different role. The City and Port are the business engine of Durban focussed around transportation, maritime industry and business support, the SDB’s role is to support the Port and forms the petrochemical hub, the West will support road based logistics and industrial development whilst the new northern hub will provide the air-based logistics installations and related supportive industrial and business development.
The four zones and hubs of the EM collectively form the largest and southernmost node of the Ethekwini-Umhlathuze Provincial development corridor (Figure 1-2).

In order to respond to the emerging development pattern, a balance between national and metropolitan efficiency imperatives and those of City residents is required. Accordingly, the desirableness and attractiveness of the EMA as a destination of choice for doing business, for living and for visiting should also be protected and enhanced.

All of the above should be contemplated within a sustainable spatial and physical development framework that protects scarce resources (i.e. environmental and agricultural assets) and which builds in a capacity to accommodate climate change implications.

Key Directives for the City

- **Establish and plan for the growth and development of key economic hubs/zones of the City (NUDC)**
- **Protect scarce natural resources, asset base, promote sustainability and accommodate anticipated climate change implications**
- **Provide a choice and quality of lifestyles for City residents to residents**

The NUDC must be understood within this development context (Figure 1-3). The north is moving away from being an area that accommodated high income residential expansion, the relocation of the offices sector to the Umhlanga Ridge and public housing projects. The north is changing into a more complex and integrated development region, a region that engages with the new national and metropolitan logistics imperatives.
The NUDC project is about ensuring an appropriate spatial response to this context.

1.4 Strategic Spatial Structuring Directives

In order to respond to the transforming structure of the City a number of levels of development guidelines are required and which together form an overarching spatial development framework. These guidelines include the following:

1. Strategic and metropolitan level **Spatial Structuring Directives** (i.e. macro level land use guidelines) – contained in the EM Spatial Development Framework (SDF) and Integrated Development Plan (IDP)

2. **Development Control Guidelines** (i.e. land use management guidelines and controls) – contained in Town Planning Schemes and Bylaws

3. **Implementation and Phasing Guidelines** i.e. a land release strategy and associated infrastructure development programme – Integrated Development Plan (IDP) plans and budgets

This document contains sub metropolitan level strategic spatial structuring directives for the NUDC and its composite Local Areas (LA’s) whilst the development control guidelines and implementation and phasing guidelines are outlined in the LAP’s for Phoenix-INK, Verulam-Cornubia and Tongaat-DTP.

The strategic spatial development strategies for the NUDC include the following:

- Provide for economic development and growth and accommodate the population expansion that is anticipated in the northern areas of the metropolitan area
  - Provide for well located and well serviced economic areas
  - Provide for well located and well serviced residential areas

- Creating a More Efficient Urban Form
  - Establish an Urban Development Line and Development Phasing Line
  - Promote and encourage densification
  - Encourage a transit-orientated urban development form

- Creating Structure and Identity
  - Clarify Sub-Area Roles in terms of their national, metropolitan and/or local significance
  - Provide for a Variety of Lifestyle Options
  - Establish a Hierarchy of Development Nodes
  - Establish a Hierarchy of Development Spines
  - Establish an Integrated Open Space Network
  - Develop a Transportation Concept
2 SPATIAL CONCEPT FOR THE NUDC

2.1 Vision and Goals

2.1.1 Vision

The NUDC will be developed as a mixed use development corridor which will consolidate existing and anticipated future population and economic growth in the northern metropolitan area into a spatial pattern that reinforces the new airport node as an internationally competitive “Aerotropolis”\(^1\) whilst simultaneously establishing and/or enhancing the roles and characteristics of established and/or new development nodes, spines and neighbourhoods.

It will do this through the integration of existing development with new opportunities for housing, business, industry, commerce and logistics through an efficient transport oriented urban form and through transportation systems and networks that will be multi-modal and will promote the increased use of public transportation and accommodate the efficient movement of freight.

The urban form will be more compacted and structured and it will be punctuated by an integrated open space system that provides for the protection of biodiversity and for the recreational and cultural needs of the local and metropolitan population, whilst enhancing the resilience of the natural systems and local communities with respect to the implications of global environmental change.

2.1.2 Spatial Development Strategies

The spatial development strategies for the NUDC are as follow:-

a) Protection

- **Contain and prevent urban sprawl** from eroding the metropolitan agricultural and environmental asset base located to the west of the study
- **Protect and where possible enhance and expand the natural asset base** contained in the river systems of the Umgeni, Piesang, Ohlanga, Mdloti and Tongaat River valleys so as to maximise opportunities for local and regional recreation, environmental services provision and to support climate change mitigation initiatives
- Promote a spatial development pattern that will make **efficient use of existing water and sanitation infrastructure** and that will **enable the provision of sustainable infrastructure** in the future.

b) Expansion

- Promote the **establishment of the area of Cornubia as a new town** to accommodate anticipated population and associated business growth in the north
- Provide for the consolidation of the new airport and trade port installations into a world class “Aerotropolis” through the **identification of land for logistics and industrial and business development** which will form a major new development node in the northern sub-metropolitan area of the municipality

\(^1\) An urban form concept first defined by Dr. John D. Kasarda to explain how airports are becoming the central focus for urban development, a change from the traditional urban form focus around central city cores.

Such a concept requires:-

- Mixed use development in close proximity to an Airport
- Efficient (time-sensitive) transportation links from major regional business and residential nodes into the Airport i.e. reduced congestion, good interchanges, freight routes and regional mobility
- Development to be clustered along airport transportation corridors and not take the form of strip development

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• **Integration and consolidation** of Phoenix-INK neighbourhoods with the metropolitan area through the provision of additional key external linkage routes and through a system of development nodes and spines that will accommodate a mix of uses that can serve the local resident populations and which will be consolidated around the emerging new Bridge City.

• Provide for the establishment of a **multi modal transportation network** that will respect the integrity of regional traffic movements whilst providing for local traffic movements and that will effectively link the NUDC into the networks of the central, southern and western metropolitan area

d) **Creation**

• Provide for the establishment of an urban development corridor that promotes **transit-orientated development** through the creation of mixed use, high density living and working environments located within close proximity to multi-modal transportation networks which emphasises the use of public transport

• Promote **higher net densities** in residential areas and a wider **range of housing types** that cater for a wider mix of income groups and lifestyle options

### 2.2 Spatial Development Concept

The vision, roles and objectives for the NUDC are articulated in the following spatial development concept diagrams and explained in text that follows. These concepts provide the overarching rationale for the more detailed spatial framework plans described in the Local Area Plans.

A summary of the spatial concept for the NUDC is provided in Figure 2-1 to Figure 2-5.
Establish and enforce urban development line (UDL) west of NUDC to protect agricultural assets and environment assets and to promote more efficient development of urban areas within the corridor.

Increase overall net residential densities within the various neighbourhoods of the NUDC to create increased thresholds for public transportation, provision of services and creation of improved economic opportunities.

Protect and consolidate the open space systems associated with the river systems to provide for local and regional recreation needs.

Develop the open space network as a system to maximise the delivery of environmental services provision and to support climate change mitigation initiatives.
Figure 2-3: Elements of Spatial Concept - Nodes & Expansion Areas

- Establish a system of growth nodes for both residential and economic expansion that build on and consolidate existing energies and that create new opportunities for urban living and economic expansion.

- Consolidate the Phoenix-INK area through densification and infill.

- Expand and consolidate the towns of Verulam and Tongaat.

- Establish a new town at Cornubia.

- Provide for the consolidation of the KSIA/Dube Trade Port and provide for the establishment of the Aerotropolis.

Figure 2-4: Elements of Spatial Concept - Transportation Network

- Protect and enhance regional mobility through the identification of a clear road hierarchy.

- Establish new, and consolidate existing, east/west and north/south transport corridors to create a regional accessibility, mobility and connectivity grid for existing and proposed new growth nodes and elements.
Figure 2-5: Summary of Spatial Concept for NUDC
2.2.1 Accommodate Economic Development and Growth and Accommodate Population Expansion

a) Provide Well Located and Well Serviced Economic Areas

Identify and establish new areas to accommodate anticipated economic growth in a manner that reinforces the objectives of compact city growth so as to contribute to the restructuring of the northern areas of the metropolitan area. The areas need to be sufficient to accommodate anticipated growth and development of the metro in relation to the anticipated growth pulses of the new “Aerotropolis”.

They need to be located in a manner that takes cognisance of the existing servicing infrastructure whilst also providing direction as to where new infrastructure is to be provided if the compact city objectives are to be achieved.

b) Provide Well Located and Well Serviced Residential Areas

Existing and new residential areas need to be provided that will meet the anticipated growth of metropolitan population that will locate in the in the northern metropolitan areas. These areas need to be restructured and or located in a manner that increases and improves their connectivity to the metropolitan systems of opportunity in terms of employment and social services.

As with economic areas these areas need to be located in a manner that takes cognisance of the existing servicing infrastructure whilst also providing direction as to where new infrastructure is to be provided if the compact city objectives are to be achieved.

2.2.2 Creating a More Efficient Urban Form

A key condition that needs to be promoted within the NUDC is a compact urban form. This will require the containment of urban sprawl and may be accomplished through the establishment of an Urban Development Line (UDL) in conjunction with an appropriate urban densification strategy for the corridor. Furthermore identity and structure need to be created and maintained in order to establish quality working and living environments.

a) Establish an Urban Development Line & Development Phasing Line

The Urban Development Line (UDL) is located along the western boundary of the NUDC and demarcates the boundary between long term future urban areas, rural and agricultural areas within the Northern Municipal Regional (NMPR).

The phasing of development inside the UDL and within the NUDC will be determined by a “development phasing line” (DPL). The “development phasing line” indicates the interim spatial limits to which development will be allowed to establish in accordance with transportation and infrastructure availability and capacity and municipal planning objectives. It will be a primary tool for influencing the pattern of urban expansion within the demarcated NUDC.

Not all areas within the UDL will be available for development. Environmentally sensitive areas will be protected as will areas identified for future bulk infrastructure and major transportation corridors.

The rationale for the UDL and DPL is to promote:-

- the protection of high value agricultural land in the metropolitan hinterland
  - Linked to long term food security objectives for the metropolitan region
  - Linked to agriculturally oriented export opportunities associated with the Dube Trade Port
- to protect upper catchment ecological/biodiversity assets
- to promote intensive use of land within the corridor and integrate fragmented urban development
- that the development of a viable public transport system is supported
- the efficient and cost effective use of municipal bulk infrastructure
- the protection of rural lifestyle options

The UDL includes expansion areas for future growth which are adjacent to existing urban areas. Cognisance of geophysical elements, river and wastewater catchments, land use

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2 The UDL demarcated in the 2009 NSDP has been refined through the NUDC Project.
and related patterns, demographic and population profiles and trends, socio-cultural and historic environments and visual resource analysis has been taken into account in determining the UDL (Figure 2-6).

In the Phoenix-INK LA, the UDL has been determined by the Umgeni River Corridor and Mzinyathi Stream to the west and Armstrong Ridge and Amaoti River to the north. The UDL then follows the Ngovolwana River north and then follows the ridgeline of Sunkist and Hillcrest Drive. The Verulam Quarry, Black Mhlasini and Mdloti Rivers border the Verulam-Cornubia LA to the north. In the Tongaat-Dube LA, the UDL has been determined by the Mdloti and Hlawe Rivers to the west, a ridgeline towards the Tongati River and Dudley Pringle Dam.

The DPL in Phoenix-INK corresponds with the UDL. In Verulam-Cornubia, the DPL includes the sub-area of Verulam, of which a portion on the western edge of Redcliffe is excluded. The Cornubia sub-area south of the Mdloti River is included. Sibaya West has not been identified for development prior to 2030. In Tongaat-Dube, the DPL includes the Tongaat sub-area, a portion of Inyaninga, a portion of the Airport and the support zone at Moreland and existing developed areas of Greylands.
b) **Promote and Encourage Densification**

Major planning concerns relating to existing and emerging urban form are:

- low development yields (i.e. low “net” residential density) that is being achieved in greenfield developments
- fragmented pattern of urban settlement that has occurred
- low levels of densification in brownfields (existing) residential areas.

The goal for the corridor is thus to achieve higher overall “gross” densities across the study area through both the development of higher “net” residential densities in targeted areas as well as through infill and densification.

Although Infill and densification of the NUDC is occurring on a daily basis through the conversion of agricultural land to residential uses, ad hoc redevelopment in existing areas and the development of backyard shacks within informal areas, this needs to be increased and focused in target areas.

The spatial strategy to achieve this is therefore to:-

- limit the urban development footprint according to the UDL
- promote higher “net” residential densities in targeted areas (both greenfield and brownfield)
- Create new residential development opportunities that connect fragmented areas and consolidate urban form around high accessibility routes and spines.

The overall target density for the NUDC is a gross base density\(^3\) of 40du/ha, however the following density targets apply to specific areas within the NUDC (Table 2-1).

### Table 2-1: Density Targets for NUDC

<table>
<thead>
<tr>
<th>Spatial Element</th>
<th>Minimum Density</th>
<th>Applicability</th>
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<tbody>
<tr>
<td>Within and in Proximity to Sub-Metropolitan Nodes</td>
<td>Net Density(^4) of 80-150du/ha</td>
<td>Tongaat CBD, Verulam CBD, Bridge City</td>
</tr>
<tr>
<td>Within and in Proximity to Local Area Nodes</td>
<td>Net Density of 40-80du/ha</td>
<td>Newlands Town Centre, KwaMashu Town Centre, Phoenix Town Centre, New Cornubia Node</td>
</tr>
<tr>
<td>Within and in Proximity to Neighbourhood Nodes</td>
<td>Net Density of 40-80du/ha</td>
<td>KwaNozaza, Emtechbeni, Dube Village, Lindelani, MR577 (Dumisani Makhaye Drive)/Ntuzuma Main Rd, New neighbourhood nodes to be identified in Cornubia development</td>
</tr>
<tr>
<td>Within and in Proximity to Rail or Mass Transit Stations</td>
<td>Net Density of 80-150du/ha</td>
<td>In the residential areas that are within 2 km proximity to major public transport facilities and within 400-800m of all existing and proposed rail stations and sub-metropolitan bus or taxi ranks</td>
</tr>
<tr>
<td>Within and in Proximity to Development Spines</td>
<td>Net Density of 80-150du/ha</td>
<td>In the residential areas that are within 2 km of the R102 and other recognised Development Spines</td>
</tr>
<tr>
<td>Other Areas</td>
<td><strong>Urban</strong> Net Density of 40-80 units/ha, <strong>Suburban</strong> Net Density of 15-40 units/ha, <strong>Rural</strong> Net Density of 1-15 units/ha</td>
<td></td>
</tr>
</tbody>
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\(^3\) Gross Base Density - The average number of dwelling units per hectare across the NUDC excluding major land-extensive uses such as the open space system (ESMP), industrial areas, and the airport and trade port.

\(^4\) Net Density - The number of dwelling units per hectare of land calculated on land used for residential purposes only.
### 2.2.3 Create Structure and Identity

#### a) Clarify Sub-Areas Roles

The Local Area’s (LA’s) identified in the NSDP are spatial planning units within the Municipality’s overall planning system. The NSDP identified three local areas within the NUDC: Phoenix-INK, Verulam-Cornubia, and Tongaat-DTP. Essentially these were determined by major north/south and east/west geo-physical barriers i.e. the N2, M41, rural edge and the Umgeni and Mdloti Rivers.

The three LA’s have each been divided into fifteen (15) discrete sub-areas which are spatially and functionally connected and which display their own set of landscape and settlement characters and identity (see Figure 2-7).

These sub-areas contain a number of inherent opportunities for, and constraints to development by virtue of their land use characteristics and their metropolitan accessibility levels. And these characteristics combine to provide a specific role in the broader metropolitan growth and development objectives.

The role that each sub-area will play has been defined by the function of its primary land use characteristics (i.e. social, economic or environmental). Table 2-2 to Table 2-4 indicates the types of role that are, or could be played, by the sub-area in the NUDC and indicates the significance of the role in terms of either a national, metropolitan or local scale. These roles are also spatially represented in Figure 2-8.

Land use proposals for the LA respond and complement these roles and are outlined in the land use and activity framework and the sub-area guidelines prepared for the LAPs.
Table 2-2: Primary Roles for Sub-Areas in Phoenix-INK

<table>
<thead>
<tr>
<th>Sub-Area</th>
<th>Roles and Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Coast Road</td>
<td>• Local mixed use, mixed density and mixed income urban living areas&lt;br&gt;• Sub-metropolitan industrial/business park node (Riverhorse) and local industrial/business park node (Springfield)&lt;br&gt;• Sub metropolitan provision of environmental services</td>
</tr>
<tr>
<td>Newlands</td>
<td>• Local mixed use, mixed density and mixed income urban living areas&lt;br&gt;• Sub-metropolitan industrial/business park node (Riverhorse)&lt;br&gt;• Sub metropolitan and local provision of environmental services</td>
</tr>
<tr>
<td>KwaMashu</td>
<td>• Sub-metropolitan mixed use node (Bridge City)&lt;br&gt;• Northern intermodal transport terminal</td>
</tr>
<tr>
<td>Inanda/Ntuzuma</td>
<td>• Local mixed use, mixed density and mixed income urban living areas&lt;br&gt;• Protection of urban development line&lt;br&gt;• Sub metropolitan and local provision of environmental services</td>
</tr>
<tr>
<td>Inanda North</td>
<td>• Local mixed use, mixed density and mixed income urban living areas&lt;br&gt;• Protection of urban development line&lt;br&gt;• Sub metropolitan and local provision of environmental services</td>
</tr>
<tr>
<td>Phoenix</td>
<td>• Local mixed use, mixed density and mixed income urban living areas&lt;br&gt;• Metropolitan industrial node (Phoenix Industrial &amp; Corobrick Lands)&lt;br&gt;• Local provision of environmental services</td>
</tr>
</tbody>
</table>

Table 2-3: Primary Roles for Sub-Areas in Verulam Cornubia

<table>
<thead>
<tr>
<th>Sub-Area</th>
<th>Roles and Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verulam</td>
<td>• Local mixed use, mixed density and mixed income urban living areas&lt;br&gt;• Sub-metropolitan mixed use, business and services town centre (Verulam)&lt;br&gt;• Regional public transport intermodal terminal (Verulam)&lt;br&gt;• Consolidation of Existing Industrial precinct (Canelands)&lt;br&gt;• Protection of urban development line&lt;br&gt;• Protection of the environmental roles of the Ohlanga and Mdloti River systems</td>
</tr>
<tr>
<td>Cornubia</td>
<td>• New Town to accommodate local mixed use, mixed density and mixed income urban living areas expansion zone&lt;br&gt;• New local light industrial node (Ottawa Flats)&lt;br&gt;• Establishment of part of the new north-south multi modal transit oriented development spine connecting Phoenix-INK and the metro HPPTN to the Airport and Dube Trade Port.&lt;br&gt;• Protection of the environmental roles of the Ohlanga River systems</td>
</tr>
<tr>
<td>Sibaya West</td>
<td>• Short term agricultural zone&lt;br&gt;• Long term expansion zone new town to accommodate local mixed use, mixed density and mixed income urban living areas.&lt;br&gt;• Protection of the environmental roles of the Mdloti River system.&lt;br&gt;• Sub metropolitan and Local provision of environmental services</td>
</tr>
</tbody>
</table>
Table 2-4: Primary Roles for Sub-Areas in Tongaat-DTP

Tongaat
- Sub-metropolitan mixed use, business and services town centre (Tongaat)
- Local industrial nodes
- Local mixed use, mixed density and mixed income urban living areas
- Protection of urban development line
- Sub metropolitan and Local provision of environmental services

Mt Moreland
- Metropolitan office/business/hospitality support zone to airport
- Conservation of sub-metropolitan environmental assets
- National, Sub metropolitan and local provision of environmental services

La Mercy
- International airport
- National and metropolitan logistic platform
- Metropolitan office, industrial and business development
- Tourism and Hospitality support zone and tourism support zone
- Sub metropolitan and Local provision of environmental services

Inyaninga
- Local mixed use, mixed density and mixed income urban living areas expansion zone
- Metropolitan industrial and logistics expansion zone
- Protection of urban development line
- Local provision of environmental services

Greylands
- Metropolitan business park
- Light industrial expansion zone
- Protection of urban development line
- Sub metropolitan and Local provision of environmental services

Watson North
- Metropolitan business office park
- Light industrial expansion zone
- Sub metropolitan and Local provision of environmental services

The primary lifestyle options that can be identified within the NUDC and that need to be protected, enhanced and/or established include:
- *Urban*
- *Suburban*
- *Rural Agricultural*

b) Provide for Variety of Lifestyle Options

Residents within the corridor will find themselves in different lifecycle/stages and their demands and needs for residential and employment spaces will changes over time. The corridor must therefore provide for a range of lifestyle choices.

Future planning for the corridor should also protect against a “sameness” to the landscape and living environment and should seek to ensure that a distinctive local character and identity is ascribed to new, and redeveloped residential areas.

The differentiating characteristics of an area falling within the lifestyle options will in turn be discernable through elements such as local or neighbourhood settlement density, building form, public space and landscape.

Urban settlement types, particularly higher density options, should be located along major transportation routes and sub-area collector roads, within the hierarchy of mixed use nodes and/or neighbourhood centres.
Suburban options should be used in low density form as low impact edges to various components of the open space system and the agricultural hinterland. Medium density options should be used to infill between higher density environments and low density edges.

c) Establish a Hierarchy of Development Nodes

Nodes are clusters of mixed land use, including residential, which provide opportunity for mixed public and private investment and which service surrounding urban or rural areas with respect to commercial and social services and public transportation.

Through the establishment of a hierarchy of development nodes, an interconnected polycentric system of service points is provided thereby improving accessibility to opportunities, reducing the need for lengthy travel trips and assisting in the spatial restructuring of the metropolitan area.

Nodes are also a means by which to establish identity within the urban fabric. The physical form of the nodes is dependent on the function, size and age of the node and could take the form of a grid of streets, a single major intersection, a single activity street or single large site. However, all types of node include a cluster of mixed use and activity.

Each of the nodes in the NUDC will perform the following roles/functions:-

**Metropolitan Nodes (Specialised Node)**
*Areas that offer specialised activities that benefit an area wider than the sub-metropolitan area in which they are located.*

- King Shaka International Airport and Dube Trade Port
  A key component of the national, regional and metropolitan logistics platform for both passengers and freight and provides the basis for a range of interconnected new industrial and business development opportunities for the region.

**Sub-Metropolitan Nodes**
*Destinations that offer day to day business, transport and social services to sub-metropolitan areas.*

- Bridge City

A new sub-metropolitan node (town centre) development to serve Phoenix-INK conurbation with mixed commercial and social services, high density residential and a new major northern intermodal passenger terminus.

- **Verulam CBD**
  Multipurpose business, social service and intermodal transportation terminal centre that services the surrounding urban and rural communities beyond the NUDC.

- **Tongaat CBD**
  Multipurpose business, social service and intermodal transportation terminal centre that services the surrounding urban and rural communities beyond the NUDC.

**Local Urban Nodes**
*Lower order nodes that offer day to day business, transport and social services local communities only.*

- **Phoenix**
  An existing local urban node (town centre) that serves the greater Phoenix and Inanda communities with a mix of commercial and social services.

- **Newlands**
  An existing local urban node (town centre) that serves the greater Newlands community with a mix of commercial and social services.

- **KwaMashu**
  An existing local urban node (town centre) that serves the greater KwaMashu community with a mix of commercial and social services.

- **Proposed Node in Cornubia**
  A proposed local urban node (town centre) to serve the greater Cornubia community with a mix of commercial and social services.

**Neighbourhood Nodes**
*A day to day shopping and social services centre for a neighbourhood only.*

- **KwaNozaza**
  A proposed neighbourhood node to serve local neighbourhoods within Inanda/Ntuzuma with limited commercial and social services.
- **Emtshesheni**
  An existing neighbourhood node to serve local neighbourhoods within Inanda North with limited commercial and social services

- **Dube Village**
  An existing neighbourhood node to serve local neighbourhoods within Inanda/Ntuzuma and Phoenix with limited commercial and social services

- **Lindelani**
  A proposed neighbourhood node to serve local neighbourhoods within Inanda/Ntuzuma and KwaMashu with limited commercial and social services

- **Dumisani Makhaye Drive (MRS77)/Ntuzuma Main Rd**
  A proposed neighbourhood node to serve local neighbourhoods within KwaMashu with limited commercial and social services.

- **New Neighbourhood Nodes in Cornubia**
  Proposed neighbourhood nodes to serve local neighbourhoods within Cornubia with limited commercial and social services.

**d) Establish a Hierarchy of Development Spines**

A hierarchy of development nodes is supported by a concomitant hierarchy and network of development spines i.e. road and/or rail transportation routes that link various nodes, industrial opportunity areas and high density residential areas into linear urban systems.

These spines provide an opportunity to integrate land use and transportation into more accessible, efficient and sustainable urban living systems, the promotion of cohesive and integrated communities and the efficient use of, and access to urban resources thus supporting the notion of transit-orientated development.

**Metropolitan Spines**

*Provides linkage across and access to local areas and the metropolitan area as a whole*

- **R102/Chris Hani Road (North Coast Road) and Rail Line**
  The spine is a key component of HPPTN\(^5\) and requires consolidation and expansion from Warwick Triangle to Bridge City along Chris Hani Road (North Coast Road) to Bridge City.

  From Bridge City northwards the M25 forms part of the metropolitan public transportation feeder system to link with the rail component.

  The commuter rail component will link into the Durban CBD directly via Bridge City whilst the road based public transportation portion will link via the sub-metropolitan employment areas of Riverhorse Valley and Springfield Industrial Parks into the CBD via Chris Hani Road (North Coast Road).

- **R102/Gopalal Hurbans Road and Rail Line**
  The metropolitan spine is to be extended along the R102 northwards to link Dube Trade Port/KSIA with the sub-metropolitan nodes of Verulam and Tongaat and to Stanger and beyond in the north. This is to be strengthened by a public transport spine between Bridge City and the Dube Trade Port/KSIA.

- **New Transport Oriented Multi Modal Spine**
  Extends from Bridge City (public transport terminal for HPPTN) through Mt Edgecombe industrial and business node through Cornubia to Airport and reconnects to existing line north of Tongaat. The new spine will eventually link KSIA directly with the Durban CBD as well as with the northern expansion of the corridor to Ilembe and eventually to Richards Bay. The spine will be a mixed use commercial, industrial and social services corridor that will contain residential uses associated with business and which will be designed to mitigate any noise impacts associated with the King Shaka Airport.

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\(^5\) High Priority Public Transport Network
Sub-Metropolitan Spine

*Provides access and linkage across within local areas*

The following development spines will operate as public transportation spines and will link the coastal and urban development corridors with the rural hinterland corridor.

- MR 93/M25 (Curnick Ndlovu Highway)
- M21 (Inanda Road)
- MR577 (Dumisani Makhaye Drive)
- New Eastern Arterial

Higher density residential is to be encouraged along these spines where access to the public transport facilities is possible, and in the designated nodes.

These will be supported by a number of local level spines and east-west linkages.

- M45 (Queen Nandi Drive)
- Northern Expressway
- Malandela Road
- M23 (Ntuzuma Highway)
- New Cornubia Arterial
- M27 (Jabu Ngcobo Drive)
- King Shaka International Airport Link Road (M65)
- Ushukela Highway (M47)
- New Tongaat East/West link north of Tongaat River

**e) Open Space System**

The environmental assets with the NUDC are highly pressurised and fragile. The green corridors associated with the river catchments that traverse the area need to be protected, and where possible expanded and enhanced. These corridors provide vital ecological and recreational amenity services for the metropolitan area as a whole and specifically the NUDC.

The portions of the Umgeni, Ohlanga, Mdloti, and Tongati River Catchment Systems within the NUDC which drain west / east and which link the ecological assets contained within the rural hinterland of the metropolitan area with those located in the coastal corridor are severely impacted by existing urban and agricultural development. These portions must be protected and enhanced to be able to provide the links between the hinterland and coastal systems and to continue to provide ecological services and concomitant benefits to metropolitan residents.

In addition to these sub metro and local environmental services roles the open space system is an integral part of the City’s “infrastructure” that will need to be planned and incorporated into its climate change mitigation strategies.

**f) Develop a Transportation Concept**

The transportation network will be enhanced in response to the long term NUDC land use projections described in the previous sections. Key elements and concepts underpinning the proposed NUDC transportation network include the following:

**Transit Oriented Development**

To support compact urban development and the proposed restructuring of the NUDC a new Central Mobility Corridor is proposed in the centre of the corridor, parallel to the N2. This multi modal transportation element will form the central spine of the higher density and mixed land uses proposed for this part of the corridor. It will also form the extended public transport trunk route linking Bridge City (HPPTN terminal point) through the proposed Cornubia Town Centre with Dube Tradeport / King Shaka International Airport with the other nodes in the NUDC. It will also link the NUDC with the Durban CBD in the south and with destinations further north of the metropolitan area.

**Regional Mobility**

High quality mobility on the national road network is essential if the metropolitan area, the province and the country are to maintain and or increase economic growth.

One of the key strengths of the NUDC is the high quality road connectivity in the metropolitan area and the region via the N2. To ensure these benefits remain now, and are enhanced in the future, the role of the N2 needs to be protected and strengthened as a national and regional mobility corridor that provides reliable travel times for goods and persons.
Strengthening the R102 as an additional metropolitan and regional mobility corridor is a fundamental strategy for protecting and supporting the N2 as the strategic national corridor linking Durban to Richards Bay and further north. Providing for local trips starting and ending within the region will find in the R102 a viable alternative for the N2.

Transit Oriented Development

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Integration with the metropolitan area and the surrounding region

The abovementioned networks and systems in addition to the completion of the MR577 south of the Umgeni River will provide a high quality regional mobility corridor that will link the NUDC with the large industrial area in Pinetown / New Germany and the other parts of the metropolitan area. This presents a much shorter travel time for residents of Ntuzuma, Inanda and KwaMashu to the main employment nodes outside of the NUDC.

The Inanda, Ntuzuma and KwaMashu area will also be linked to the existing and envisioned commercial and industrial developments in the north via the Northern Expressway. The additional link will open up new opportunities for these fragmented communities as a result of the shorter travel time and higher levels of accessibility to employment and amenities.

East West connectivity

In addition to strengthening the regional mobility corridors with the R102 and the M4, east-west cross linkages are proposed between them to strengthen the north-south oriented networks and provide linkages to N2 at strategic locations offering increased and improved choice and accessibility.

Key Transportation Principles

Developing a transportation network for the NUDC requires strategic interventions. These can be applied at two planning levels; land use and transport network. Land use interventions entail the mix of residential, commercial and industrial land, their density and characteristics. Transport interventions are based on a given land use mix and are focused on travel patterns (where to and what time of the day) and modes of transport.

Key to developing the NUDC is the concept of Transport Oriented Development.

Characteristics Transport Oriented Development:

- A regional node containing a mixture of uses in close proximity including office, residential, retail, and civic uses High density, high-quality development within 10-minute walk circle surrounding public transport nodes
- Walkable design with pedestrian as the highest priority
- Public Transport Nodes as prominent feature of town centres
- Feeder transit systems with buses and minibus taxis
- Reduced and managed parking inside 10-minute walk circle around public transport nodes

Benefits of Transport Oriented Development:

- Transit investment has double the economic benefit to a city than highway investment.
- Transit can enable a city to use market forces to increase densities near stations, where most services are located, thus creating more efficient sub centers and minimizing sprawl.
- Transit enables a city to be more corridor-oriented, making it easier to provide infrastructure.
- Transit enhances the overall economic efficiency of a city.
- Transit reduces carbon emissions and increases energy efficiency

Taken from Sustainability and Cities: Overcoming Automobile Dependence, by Newman & Kenworthy.
Additional transport interventions are also required, these include:

1. **Trip Reduction:**
   - The transport system as a whole will adjust over time due to the congestion on the road network and changes in live style (e.g. working from home). A reduction of 3% in the private vehicle trips for the morning peak was assumed due to this system adjustment.

2. **Modal Shift:**
   - By limiting the increase in road capacity and increasing the capacity and quality of public transport services it can be expected that more people in all income groups will use public transport for their daily commute. Based on travel time (for both modes) and number of transfers (for public transport) the modal split was determined.

3. **Peak Spreading:**
   - The current road capacity can not accommodate the forecasted private vehicle trips in a one hour morning peak. It can be expected that commuters will adjust their behaviour to avoid long travel times. Some motorists will therefore be forced to either travel earlier or later, thereby reducing the demand within the peak hour. The impact of peak spreading is based on the assumption that the current levels of congestion are the benchmark.

4. **Peak Spreading and Modal Shift:**
   - The expected future land use is of such a magnitude that likely intervention 3 and 4 will arise. In intervention 4 the combined effect of peak spreading and modal shift was determined will be. The effect of peak spreading was first determined (this is a scaled down affect compared to (3)). Thereafter the modal split was determined in the same way as described with intervention 2.

5. **Maximize Short Distance trips within the NUDC:**
   - With the further development of the city it can be expected that people will relocate to be as close to their jobs as possible to reduce their travel time and distance. Those that are unable to relocate in order to be able to reduce their trip to the shortest possible will follow the current trip distribution.

The demand for transport in the NUDC is expected to increase significantly and the current supply of transport will not be able to meet this demand.

In order to maintain a sustainable growth to the city of Durban a sustainable transport system for the northern area needs to be developed.
Figure 2-10: Applied Spatial Concept for Ultimate Development Footprint of NUDC
Figure 2-11: Applied Spatial Concept for Local Area Plans (2030)