Inyaninga and Tongaat Functional Area Plans and Scheme Recommendations

Phase 2: Functional Area Plans for Tongaat and Inyaninga

The Planning Initiative and Virtual Consulting Engineers Team

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TONGAAT AND INYANINGA FUNCTIONAL AREA PLANS (FAPs) AND SCHEME RECOMMENDATIONS

2. Phase 2: Functional Area Plans for Tongaat and Inyaninga, Virtual Consulting Engineers and The Planning Initiative, March 2013
3. Phase 2: Annexures to the Functional Area Plans:
   a. Property Trends Report, Knight Frank, July 2012
   b. Environmental Sector Report, Institute of Natural Resources, May 2012
   d. Housing and Residential Analysis, Virtual Consulting Engineers, July 2012
4. Phase 3: Scheme Recommendations
1 INTRODUCTION

The purpose of this report is to present the Functional Area Plans for two sub-areas located in the north of the eThekwini Municipality, namely Tongaat and Inyaninga. The plans have been prepared by Virtual Consulting Engineers as part of The Planning Initiative team (TPI, VCE, DMA, INR and Knight Frank) on behalf of the eThekwini Municipality.

The Municipal Systems Act, Act No 32 of 2000 requires Municipalities to prepare a Spatial Development Framework (SDF) as part of their Integrated Development Plan (IDP), which gives guidance on the preparation of a Land Use Management System (LUMS) for the area. In accordance with these requirements the eThekwini Municipality has prepared their IDP and SDF. They have proceeded further to develop a package of plans to assist in land use management and decision making including Spatial Development Plans, Local Area Plans, Functional Area Plans and Land Use Schemes. To this end The Northern Spatial Development Plan, the Northern Urban Development Corridor Plan (NUDC) and the Tongaat-DTP Local Area Plan (T-DTPLAP) have been prepared and approved by Council. To complete the package of plans, this project is being undertaken to prepare Functional Area Plans (FAPs) for Tongaat and Inyaninga. These are then used to manage development within the Municipality through a number of mechanisms including Schemes as illustrated in the following diagram:

FIGURE 1: PACKAGE OF PLANS AND CITY MANAGEMENT

The project methodology is set out in Table 1. This report covers the completion of Phase 2 of the project involving the preparation of the Tongaat and Inyaninga Functional Area Plans.

TABLE 1: PROJECT METHODOLOGY

<table>
<thead>
<tr>
<th>Phase</th>
<th>Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1: Inception</td>
<td>Agree on deliverables and methodology and undertake data gathering</td>
</tr>
<tr>
<td>Phase 2: Functional Area Plans</td>
<td>Bulk Infrastructure Assessment</td>
</tr>
<tr>
<td></td>
<td>Residential/Housing Analysis</td>
</tr>
<tr>
<td></td>
<td>Environmental Analysis</td>
</tr>
<tr>
<td></td>
<td>Contextual and Detailed Planning Analysis</td>
</tr>
<tr>
<td></td>
<td>Property Trend Analysis</td>
</tr>
<tr>
<td></td>
<td>Rates Policy</td>
</tr>
<tr>
<td></td>
<td>5 year plans - Project identification and budgets</td>
</tr>
<tr>
<td></td>
<td>Infrastructure Implementation</td>
</tr>
<tr>
<td></td>
<td>Infrastructure Management</td>
</tr>
<tr>
<td></td>
<td>Other</td>
</tr>
<tr>
<td></td>
<td>Scheme</td>
</tr>
</tbody>
</table>
The primary aim of this project is to take the work that has already been completed forward in a manner that will ensure that the Municipality is well prepared to facilitate future development opportunities and manage land use in the best interests of the public. To this end the project is essentially aimed at translating the work that has already been undertaken into a tool box of planning, engineering, transportation and environmental information that will allow the Municipality to respond efficiently, effectively and appropriately to development proposals put to them by private developers.

It is important to understand that much of the land in question is privately owned and that the major land owners are currently preparing proposals for the development of their land. It is therefore unnecessary for the Municipality to prepare detailed layout plans for these areas, however, it is critical that they are in a position to respond effectively to proposals when they are submitted by developers. Moreover, the area forms a key component of the proposed Aerotropolis surrounding the new international airport and has the potential to be earmarked as a Special Economic Zone. The product delivered should therefore provide a toolkit to assist the Municipality with rational decision making and land use management in the public interest to stimulate sustainable city development. Extremely tight project time frames and budgets also dictate the level of planning that can be achieved here, and may prompt additional more focused studies and planning and design detail where public interests are primary.

The final product delivered here is intended to offer a framework of adequate flexibility to allow for future proposals to respond to market trends and shifts over time as the development of the aerotropolis and potential special economic zone unfolds. The work therefore needs to focus on:

- Creating a framework at the functional planning level created by the conceptual road and open space framework within which development can infill over time.
- Creating a toolkit of draft Scheme mechanisms from which the Municipality can draw when applications form private developers are submitted.

The objective of this project is therefore to:

- Translate the directives of the Tongaat- DTP LAP Land Use and Activity Framework into more detailed level Functional Area Plans which will:
Propose conceptual layout and design proposals, paying particular attention to the spatial arrangement of land uses and movement systems with appropriate land use controls to support economic development, densification, social/gap housing and strengthening public transport oriented activity corridors.

Enable coordinated decision making between the Municipality and the private sector on infrastructure investment, transportation planning, housing, and property development;

Guide the Municipality in its assessment of development applications for the area;

Establish the land use management framework required for extending the Scheme in alignment with the Tongaat-DTP LAP as contained in the NUDC.

Integrate social housing layouts provided by the Municipality within the project areas for the functional area plans.

Ensure that the FAPs are compatible with and enhance the interface with the Dube Trade Port /King Shaka International Airport (DTP/KSIA) development and support and enhance this key national installation.

Ensure the FAP’s are compatible with and enhance the role of the Tongaat CBD and existing industrial areas, and ensure that these areas are not compromised but their role strengthened in the planning for the expansion of the surrounding areas.

Following the preparation of the FAP’s Phase 3 will then involve the preparation of a basket of Land Use Scheme mechanisms that would be incorporated into the Northern Area Consolidated Scheme. In Phase 4 the team will prepare Preliminary Budgets for projects identified and a Phasing Plan to guide development decisions.
2 FUNCTIONAL AREA PLANS (FAP) - BASE INFORMATION

2.1 PLANNING CONTEXT

The study areas, being the Tongaat and Inyaninga sub-areas, fall within the Northern Urban Development Corridor of the eThekwini Municipality as identified in the Northern Spatial Development Plan, the Northern Urban Corridor Spatial Development Plan and the Tongaat- DTP Local Area Plan. The project area lies adjacent to and west of the Dube TradePort which forms the hub of a potential Aerotropolis and is therefore a key area for future development to support and benefit from the backward and forward linkages and the enormous growth potential offered by the TradePort. A considerable amount of work has already been undertaken in the area and recorded in the package of plans mentioned. Figure 1 illustrates the study areas to be considered in this project.

The following documents are key strategic policy documents and the work presented in this project must be read in conjunction with them:

- eThekwini Long Term Development Framework
- eThekwini IDP (2012/2013)
- eThekwini Spatial Development Framework (2012/2013)
- Northern Spatial Development Plan (2009)
- Northern Urban Development Corridor (2011)
- Tongaat-DTP Local Area Plan (2011)

The Tongaat-DTP Local Area Plan (2011) identifies the two sub-areas being considered in this report as follows:

<table>
<thead>
<tr>
<th>Sub-area</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tongaat</td>
<td>Bordered by R102 to the east, Tongati River to the north, the new western bypass to the west, and Tongaat south residential to the south. Includes Tongaat Local Urban Node (Town Centre), Tongaat south and central suburbs and Tongaat South Industrial.</td>
</tr>
<tr>
<td>Inyaninga</td>
<td>Bordered by the R102 to the east, Canelands industrial and the north/south railway line to the south/south-west, the Mdloti River and the Hazelmere Dam to the west, and Tongaat South to the north. Includes Inyaninga station, Cottonlands informal settlement and mostly agricultural land.</td>
</tr>
</tbody>
</table>

2.2 LOCATION OF THE STUDY AREAS

The project area is located within the Northern portion of the eThekwini Municipality. It is approximately 35 kilometres from the eThekwini CBD, and approximately 20 kilometres from Ballito.
FIGURE 2: FUNCTIONAL AREA PLAN BOUNDARIES
FIGURE 3: INYANINGA TONGAAT FUNCTIONAL AREA PLANS - LOCALITY PLAN
2.3 SECTOR STUDIES

A number of sector assessments have been prepared to inform the project. These sector assessments will inform both the Functional Area Plans and the Scheme work undertaken as part of the project. The following sections highlight the key issues from the sector assessments as well as the recommended performance indicators. For further details, refer to the full sector reports listed in the Appendices and bound as separate reports.

2.3.1 ENVIRONMENTAL ASSESSMENT

A fairly high level but rigorous environmental study was conducted involving the incorporation of most current environmental data available to map out environmental buffers, the use of ground truthing to validate this information where required, and consultation with various departments in the eThekweni Municipality. Mapping was generated under two broad categories - the aquatic and terrestrial environments.

2.3.1.1 AQUATIC ENVIRONMENT

**Present State** – The analysis identified the current state to be unsustainable arising out of a significant degree of transformation and a high level of degradation with low levels of functionality.

**Aim** - “to improve the area and state/functioning of aquatic systems”

Spatial and planning recommendations to guide the preparation of the FAP were generated in response to the assessment of the aquatic environment:

<table>
<thead>
<tr>
<th><strong>Spatial Planning Recommendations</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Include and restore functional aquatic systems throughout the landscape – catchment integrity.</strong></td>
</tr>
<tr>
<td>- Restore functional area in each sub-catchment.</td>
</tr>
<tr>
<td>- In steeper areas - full extent of systems needs to be zoned as OSS and rehabilitated (loss is not an option).</td>
</tr>
<tr>
<td>- In flatter areas where development potential is highest may be some loss. Focus should be on restoring and maintaining the original extent of the lowest order stream and associated wetland in each sub-catchment (drainage area).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Ensure Linkages</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Aquatic systems are part of one system – ensure level of linkage between all.</td>
</tr>
<tr>
<td>- Avoid isolation of systems (Tongaat urban area represents a challenge).</td>
</tr>
<tr>
<td>- Use aquatic systems to link terrestrial systems - prioritize these systems (area/rehab effort, maintenance).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Buffers</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- General buffers mapped – need to be refined during detailed planning according to provincial guidelines (Ezemvelo KZN Wildlife).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Detailed Planning/Design Requirements</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design principles</strong></td>
</tr>
<tr>
<td>- Reduce the number of wetland/watercourse crossings.</td>
</tr>
<tr>
<td>- Cross at the narrowest point of systems.</td>
</tr>
<tr>
<td>- Where possible go over and not through wetland systems.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Mandatory Storm-water Design and Management Plan</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- A storm water design and management plan is mandatory.</td>
</tr>
<tr>
<td>- Sustainable Drainage Systems (SuDS) approach should be adopted.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Landscaping</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Mandatory landscaping plan - integrated with the storm water plan e.g. recycling of water for irrigation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Waste Water Management</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Storm-water and sewer infrastructure must be separated.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Offsets</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Apply latest science and policy in defining loss, targets and offsets sites.</td>
</tr>
</tbody>
</table>
2.3.1.2 Terrestrial Environment

**Present State** – The analysis identified the current state to be *Unsustainable* due to a highly transformed environment with few remaining terrestrial systems, and a medium to high level of degradation.

In addition the analysis recognized two areas of significant value, being:

- an homogenous area of North Coast Grassland in the north of the study area ideally suited to respond to the status of this vegetation type as critically endangered.
- An area of Mixed Woodland/grassland to the South Western linking the Tongaat and Umdloti catchments.

**Aim** - “to secure and improve the functional state of remaining terrestrial systems”

Spatial and planning recommendations to guide the preparation of the FAP were generated in response to the assessment of the terrestrial environment:

**Spatial Planning Approach/Principles**

- **Appropriate Zoning**
  - Retain terrestrial systems and their buffers as DMOSS.
- **Link Systems**
  - Link terrestrial systems through rehabilitation and appropriate zoning of aquatic systems (wetlands and drainage lines).

**Detailed Planning/Design Requirements**

- **Buffers**
  - Refine based on Provincial guidelines (Ezemvelo KZN Wildlife 2009).
- **Planning Approval**
  - A landscaping and associated rehabilitation plan should be mandatory and submitted with development applications.
  - Consider EPCD plant list.
  - Include an alien invasive management component.
- **Offsets**
  - Apply mitigation hierarchy strictly – i.e. avoid further loss at all costs.
  - If any loss – apply provincial offsets policy (Ezemvelo KZN Wildlife 2009).
- **Challenges**
  - Open Space zoning recommendations are complicated by tenure and associated property rights e.g. Hambhanathi.
  - To secure zoning then mechanisms need to be identified for:
    - Giving effect to the zoning (assigning the area stewardship or some level of protected area status),
    - Compensating current landowners for the loss of development rights.

2.3.2 Property Trends Assessment

The property trend assessment identified the following trends in the sectors indicated below.

2.3.2.1 Industrial

- In the south of Durban, the back-of-port plans and the relationship between the existing harbour and the new south basin port, is likely to significantly shape the distribution of goods and the nature of the south/north/outer west linkages.
- In the Inner West, central and North Durban region, there is a growing shortage of serviced Industrial land.
- In Cornubia, a significant one-third of the industrial land supply has sold to a number of mainly storage and distribution operators with little or no demand from manufacturers.
Generic industrial demand is principally influenced by the port, road links and proximity to markets, whereas the Dube TradePort is likely to benefit more from increased air traffic movements (passenger & freight) over generic industrial demand.

2.3.2.2 COMMERCIAL
- The impact of the new airport and associated infrastructure, together with the progressive release of serviced, greenfield development opportunities by Dube TradePort and Tongaat Hulett, have dominated new development across the eThekwini Municipality over the period leading up to and through the mid-2000 property boom.
- The retail, commercial and to some extent the business park sectors appear to be stabilising following a 2 to 3 year oversupply. The commercial sector is in over-supply in terms of land and vacant office space, characterized by a slow-down in rental growth and rising vacancies, particularly along Umhlanga Rocks Drive and Town Centre.

2.3.2.3 RESIDENTIAL
- Low cost and affordable housing remains the highest demand sector. The backlog in the supply of Metro and Provincial low cost housing units is exacerbated by a shortage of greenfield land.
- Demand in the medium to executive home market remains slow but consistent, particularly in Umhlanga Rocks (Izinga, Kindlewood and Ridgeside) though a negative real growth in house prices continues to show through over the past 5 years. Closed suburb developments remain the most sought after in this sector.

2.3.2.4 RETAIL
- The retail sector appears to be stabilising following a 2 to 3 year oversupply.

2.3.3 TRANSPORTATION ENGINEERING ASSESSMENT
The study reported on both the existing transportation network and captured proposals around future transport planning shaping planning decisions within the study area. In summary this report captured the following baseline information:

The existing transportation network:
- The R102, a Provincial road is the highest order road serving across the study area. The newly widened section, with major signalised at-grade intersections along its length, has a capacity of around 2200vph. However the R102 is constrained within the Tongaat CBD area.
- This north-south route is linked to the N2 and M4 by several east-west arterial roads such as the uShukela Highway (formally Watson Highway - M43) and the recently completed DuBe Boulevard (M65).
- The existing rail corridor links Stanger via Tongaat and Verulam to the Durban CBD. While south of KwaMashu to the CBD, this line is well utilised, north of KwaMashu patronage is low relative to capacity.
- The study area has a relatively high share of Railway Stations.
- Both Verulam and Tongaat are important public transport nodes and contain large bus and taxi facilities.

Future Transportation Planning:
- The eThekwini transport Authority is preparing a wall to wall Integrated Rapid Public Transport Network (IRPTN). The area will be served by Corridor 8 (C8) linking Warwick (CBD), Umhlanga, Cornubia, King Shaka International Airport – Tongaat.
- The major future road improvements as captured in the NUDC involve:
The realignment of the R102 to bypass Tongaat to the West with interchanges planned rather than signalised intersections.

- An arterial on the eastern side of Tongaat CBD providing access to development opportunities planned in the region, including the Dube Tradeport, Watson West and Greylands areas.

- These north south linkages are supported by planned east-west linkages including:
  - a link connecting the Eastern Arterial with the M4 via a crossing of the N2 north of the study area, and
  - a link between the P100 and Dube Boulevard (M65) linking with the proposed Eastern Arterial and the R102 with an interchange on the R102.

PRASA has commissioned a Strategic Plan to set out short to medium term interventions. Its objectives include:

- Improve connectivity to major nodes, i.e. King Shaka International Airport, Port of Durban;
- Supporting sustainable development patterns through more efficient land use / transport integration to reduce environmental impacts;
- Encourage land use densification on priority nodes and corridors.

Significant transportation planning has taken place in conjunction with planning for the Northern Urban Development Corridor study. The core objectives of this study were to:

- Protect regional mobility and connectivity within KZN Provincial Corridor
- Protect and enhance accessibility for King Shaka International Airport/Dube TradePort
- Create a sustainable transport system
  - Public Transport as a viable alternative
  - Transit Orientated Development
- Establish clear hierarchy in the transport network
- Provide linkages to major employment destinations
- Strengthen and rationalise the existing Public Transport node in Tongaat and Verulam CBDs
- Reinforce the rail back bone of high priority public transportation network
- Enhance mobility within local areas and between sub-areas

### 2.3.4 ENGINEERING SERVICES ASSESSMENT

In general the level of services and infrastructure established is sufficient to provide services of good quality and consistency to existing development. Nevertheless capacity is at its limits and there is little spare capacity to service any future expansion requirements.

Key items for consideration are as follows:

- Bulk water supply: eThekwini is currently facing supply limitations and the reliability of supply is currently below the expected standard (99% certainty). Of relevance to the Tongaat and Inyaninga FAPs is that the viability of raising Hazelmere Dam is under question. If this does not go ahead this area will require augmentation of the supply from either the south (eThekwini) or from the north (Ballito), each of which faces growing demand. Further clarification on the citywide strategy for addressing the water supply issue will be required.

- In light of the limitations on water supply, emphasis should be placed on water conservation, reuse and recycling, as well as measures to reduce water losses. Items such as water efficiency and reduction in water loss can be addressed at the scale of the Functional Area, however issues such as water recycling and alternative sources such as desalination are best addressed at a more regional scale.

- Whilst current spare capacity of the wastewater treatment plants is limited, plans are in place to increase this. However, as wastewater volumes are directly proportional to the water demand, the constraint remains the ability to provide a supply of potable water.

- eThekwini Electricity has indicated that they have not had any indication from Eskom that there is a supply limitation for electricity analogous to that of the water supply. Nevertheless, it is well known that nationally the electrical generation system is currently at or near its limits. At the scale of the
Functional Areas, measures for energy efficiency should be incorporated, as well as other measures to ensure resilience as much as possible.

2.3.5 **Housing Assessment**

In summary the Housing Assessment responded to three specific areas which need to be considered in the identification of housing opportunities in the FAP areas.

- **Housing Strategy**
  - Shift towards more compact, integrated, sustainable living environments.
  - The challenge is achieving densities on well-located land within the subsidy structure.
- **eThekwini Housing Plan (Study Area)**
  - Nearly 20,000 dwelling units proposed.
  - This figure is five times the backlog derived from the household numbers located in informal settlements (4000). This suggests that the study area is proposed as a net supplier of low-income housing to the rest of the metropolitan area.
  - The six approved housing projects are all located adjacent to the developed areas of Tongaat.
- **Densities**
  - The NUDC aims for a gross base density of 40 du/ha and densities are targeted for 80-150 du/ha within a 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.
  - Existing densities in Tongaat are low in terms of this target—gross of 16 du/ha, net of 23 du/ha.
  - 80% of residential erven within Tongaat are zoned Special Residential, SR1, SR2.

2.3.6 **Planning Status Quo Assessment**

There are a number of key physical and spatial factors that define the study area and inform the preparation of FAP’s:

- The study areas fall within the area proposed for the development of an Aerotropolis radiating outwards from the King Shaka International Airport and Dube TradePort. The Aerotropolis may be considered as an airport city with corridors and clusters of aviation-linked businesses and associated residential development or an airport integrated region, extending as far as 30km from the airport hub (Kasarda and Lindsay: Aerotropolis: the Way We will Live Next, 2011)
- Access to the study areas is via the national and regional road network including the N2, R102, uShukela Highway (M43), Dube Boulevard (M65) and M27. The P100 and R614 link the area to the rural hinterland.
- The main north-south freight and passenger railway line runs through the study areas.
- Land ownership in the area is dominated by Tongaat Hulett Developments.
- There are approximately 6,900 properties within the study areas.
- The town of Tongaat falls within the Tongaat study area and land use within the town is managed in terms of the Tongaat Scheme.
- Approximately 20% of the study area falls within the Tongaat Scheme. The rest falls outside a Scheme boundary.
- The current dominant land uses are sugar cane, residential and market gardening.
- There are a number of social facilities located within the study areas, primarily within the town of Tongaat.
- Eight informal settlements, containing a total of 3,857 households, fall within the study area.
- The Mdloti and Tongati River run through or on the borders of the study area.
- Several streams and wetlands connect into these catchments.
2.4 **Aerotropolis — Key Performance Criteria**

The study area falls adjacent to the King Shaka International Airport and Dube TradePort. Looking toward the possibilities of future growth in conjunction with the opportunities associated with an internationally connected passenger and freight ‘greenfields’ airport, the region is well placed to coordinate and support regional growth related to growth in airport related uses and in support of the ‘aerotropolis’ concept. This growth needs to be spatially well-coordinated, economically efficient, aesthetically pleasing, environmentally and socially sustainable. A number of key indicators will define the success of an Aerotropolis Region:

- **Freight Connectivity, Speed and Agility** — efficient access to the airport, with unconstrained access to regional and national road network, access to rail and access to seaports.
- Efficient, effective **Public Transport** system to move passengers and workers.
- Availability of **suitable serviced land** for development — in this case growth of the industrial and logistics sector.
- **Flexible land use** — ability to adapt to changing world market.
- **High quality urban environment** — environmentally conscious design (such as that regulated by the green star rating system); management of development through design reviews and appropriate flexible development controls; public art; landscaping etc.
- Well located **integrated living and recreating environments** that reduce the need for travel.
- An appropriate **regional open space system** that provides enhanced environmental services to the region.

2.5 **Strengths, Weaknesses, Opportunities and Constraints**

Figure 4 summarises the opportunities and constraints identified in the area.
3 FUNCTIONAL AREA PLANS – OVERALL CONCEPT

The Tongaat and Inyaninga FAPs attempt to translate the broad intentions established through the Tongaat-DTP LAP while responding to a higher detail of input derived from the identification of opportunities and constraints related to the unique characteristics of the site and site context. The spatial frameworks generated here aim at a sufficient level of detail to guide planning and investment decisions while at the same time being flexible enough to respond to market shifts. A functional area plan is intended to:

- Be a conceptual layout plan to guide the implementation of municipal infrastructure projects and the planning of future housing projects and the assessment of development applications by the private sector i.e. it is not a master plan or a definitive plan.
- Focus on the basic skeleton of development – roads and open space and possible land uses.
- Estimate potential development floor areas and number of housing units and associated social facilities and bulk infrastructure required.
- Suggest phasing of infrastructure provision and land release.
- Focus on performance criteria i.e. if a plan is submitted that does not exactly looks like the FAP it may still be acceptable if it meets the agreed performance criteria.

Conceptually the Inyaninga and Tongaat FAP’s are structured around a framework established through an assessment of the demands and opportunities of the required transport and open space systems. Once agreed by all parties and implemented these become fixed elements around which the various land uses take shape and develop in response to market conditions. This conceptual framework is intended to create a flexible framework for guiding both public and private investment decisions rather than a definitive framework such as a master plan would be.
3.1 **Open Space Framework**

The Aquatic and Terrestrial components of the main Biophysical Environmental constraints have been taken as primary determinants in shaping the distribution of land uses and the development of an urban infrastructure in support of future urban expansion. The natural system associated with the aquatic and terrestrial environments needs to be protected and integrated into a sustainable regional open space system which can offer ecological services as well as local and regional amenity, production and recreational needs. Conceptually this open space system must ultimately form a network system based on connectivity and progression from natural core areas (rivers, reserves, wetlands), to interface zones, such as community parks, market gardens and urban agriculture, to more urban located open space elements such as parks, public squares, roads and streets.

**Performance:**

The performance of the open space system will be maximised by the level of integration achieved. An integrated open space system is one that integrates across catchments, links across terrestrial and aquatic environments and is appropriately scaled to perform environmental function as a baseline criterion. Value should also be gained from this system on an economic and productive level by allowing integration with urban agriculture and market gardening where appropriate from an ecological point of view. Beyond this, performance is enhanced by integrating the natural system with the urban system - through the development of a series of parks at different scales and linking through the right of way and public space network through appropriate verge planting, and landscaping to enhance ecological function and maintain the environmental quality of developed areas.

**Trade-offs:**

The environmental system needs to be treated as a hard constraint in order for the opportunities of an integrated open space system to be realised. Where land use demands are high, appropriate off-sets will be required to address the trade-off. Appropriate urban densities need to be reached to limit the urban footprint and retain appropriate levels of ecological function.
FIGURE 5: OPEN SPACE FRAMEWORK

- Catchment Edges
- Major River System
- Cross-Catchment Linkages
- Environmental trade-off with strategic regional land use demands
- Strategic regional environmental asset
3.2 ACCESS AND MOBILITY NETWORK

The Tongaat and Inyaninga FAP areas form sub-areas within the Tongaat –DTP LAP. Consequently the conceptualisation of an access and mobility framework responds to and incorporates principles embedded in frameworks generated at a higher scale and includes:

1) The establishment of a clear hierarchy in the transport network to facilitate accessibility between residential areas and employment generating land uses as well as mobility between the local and metropolitan systems;
2) Provide linkages to major employment destinations within both the local and greater metropolitan areas by creating additional links for all modes of transport and allowing the residents of the local area the opportunity to reach areas of employment at lower cost and with a shorter travel time;
3) Build on existing transport infrastructure by strengthening and rationalising existing Public Transport nodes - such as that present in the Tongaat CBD;
4) Performance aligned with Transit Oriented Development (TOD);
5) Following on from these principles a key strategy in all future planning must be the alignment of public transport with future land use planning;

At a high level of regional connectivity the Access and Mobility Network of the Tongaat and Inyaninga FAP responds to the practical implications of:

1) The role of the R102 and adjacent rail in linking Verulam, Tongaat, the Dube TradePort and KSIA and KwaDukuza beyond, and
2) The proposed Public Transport Spine extending from Bridge City through Mt Edgecombe, Cornubia to the Airport and north. This public transport spine needs to be developed in conjunction with mixed land uses to support public transport across the northern metropolitan area and connect the airport with the Durban CBD.

Following the planning work concluded for the NUDC and the implications of the Tongaat-DTP LAP, these frameworks indicated the need for:

1) The establishment of a new alignment for the R102 (known as the Western Bypass) for regional connectivity on the north-south corridor as well as providing high quality connectivity to the agricultural and rural areas west of Tongaat. In addition the Western Bypass will divert through-traffic from the Tongaat CBD.
2) An arterial, known as the Eastern Arterial, located to the eastern side of the Tongaat CBD to enhance accessibility and development opportunities for the Dube Trade Port, Watson North and Greyland areas. Similar to the Western By-pass this arterial will divert traffic from the Tongaat CBD.
3) This connects with a Central Spine Road linking the Mt Edgecombe Highway (M41/R012) via the Jacob Ngcobo Drive (M27) with the R102 at Inyaninga.
4) An East-west link from the Gopalal Hurban Road (R102) to Vincent Dickens Road (provincial main road 100) providing direct connectivity to the airport from the agricultural and rural areas around Hazelmere and beyond.

Performance:

The Accessibility and Mobility Network should meet a number of performance criteria in delivering efficient and safe access and connectivity:

- A functional and Legible Hierarchy
  - A hierarchy of roads that complement each other in terms of function and create a high level of user choice in terms of transport modality, including non-motorised transport.
A variety of road typologies with roads playing diverse roles in response to scale and context.

- A legible hierarchy with roads designed to serve different functions, including prioritised routes for dedicated public transport and freight routes to facilitate quick access to regional mobility routes and to keep freight and heavy traffic out of local residential areas and urban cores.

- A road hierarchy that facilitates the expansion of an integrated public transport system that operates at both the metropolitan-wide and local scales. Different roads in the system need to complement each other in terms of function, so that limited access mobility roads are complimented by roads designed for slower speeds and with greater land use diversity, offering access to adjacent land uses.

- Mobility roads need to be complimented with local accessibility roads, operating adjacent and sometimes even in parallel.

- A legible road hierarchy reinforced by engineering and urban design to maintain functional legibility and character on the ground.

**An Integrated System**

- The network of mobility and access routes should maximise choice of movement across the system by creating well defined routes to allow for efficient access from local roads to mobility arterials via intermediary roads.

- An integrated public transport system which maximises on linkages between routes and different transport modalities.

- A right of way network that functions as part of a public space network and integrates with the open space system. Roads (and especially local roads) and public transport nodes, need to be seen as part of the public space network and should be designed accordingly. In appropriate places the right of way should allow for non-motorised transport (walking, cycling and other), as well as other activities such as markets, play, pedestrian staging and so on.

The *Movement Framework* incorporated in the Tongaat and Inyaninga FAP’s comprises several designated routes which define the roles that the roads and right of way system need to perform:

- **Mobility Routes**: Mobility Routes refer principally to the road based transport system and comprise freeways and regional arterials (both motorways and provincial roads). These routes should work in tandem with Metropolitan public transport routes.

- **Freight Routes**: Designated freight routes should be identified and clearly delineated to accommodate freight on roads shared by other service vehicles, private vehicles and public transport. Freight routes are identified along linkages between industrial land uses, special districts (such as the Dube TradePort) and primary road based freight mobility routes (such as the R102, N2 and Eastern Arterial).

- **Multifunctional (Activity) Routes**: Roads designated to serve a mix of land uses on their edges, to support integration and to accommodate a balance between mobility and access. These routes play an important integrating role between discrete nodal areas by locating activity at various levels of concentration immediately on their edges.

- **Public Transport Routes**: Roads playing a key public transport role by carrying people between residential areas, nodes and urban cores, and other concentrations of employment generating land uses.

- **Non-motorised routes**: local non-motorised paths, to accommodate both walking and cycling and linking public transport nodes with everyday connectivity needs and recreational opportunities. The extent and shape of the network of non-motorised routes is in part defined by pedestrian sheds. Cycling and walking opportunities need to be built into the right of way system where appropriate in support of public transport accessibility.
The following table identifies the different types of roads forming part of this hierarchy accommodated in the *Accessibility and Mobility Network*:

**TABLE 3: ACCESSIBILITY AND MOBILITY NETWORK**

<table>
<thead>
<tr>
<th>ROAD</th>
<th>TYPE</th>
<th>ACCESS AND MOBILITY</th>
<th>TRANSPORT MODE</th>
<th>DESCRIPTION AND ROLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing R102 linking in to Western Bypass</td>
<td>Dual Carriageway Limited Access Urban Arterial</td>
<td>Inter-regional Mobility, limited Access at intersections only, spacing approx. 500m</td>
<td>Regional Bus and Taxi feeder services, commuter vehicles, general freight, service vehicles, private vehicles</td>
<td>An inter-regional arterial to connect across the metropolitan system and link with other municipalities. Fast connectivity to the KSIA and DTP is key. At the inter-regional and regional scale the R102 compliments the N2 national freeway in providing fast car and freight mobility and access to primary centres, districts and key installations such as the KSIA and DTP.</td>
</tr>
<tr>
<td>Eastern Bypass</td>
<td>Dual Carriageway Limited Access Urban Arterial</td>
<td>Metropolitan Mobility, limited Access at intersections only; spacing approx. 500m</td>
<td>Dedicated public transport vehicles, metropolitan freight, service vehicles (no pedestrian or cycling unless accommodated in dedicated lanes)</td>
<td>The eastern bypass forms the extension of the proposed Dube West linking Cornubia and DTP. It performs a metropolitan mobility function and as a key structuring element for future TOD. The road will carry dedicated public transport lanes and facilities as part of the Municipality’s proposed IRPTN.</td>
</tr>
<tr>
<td>Multifunctional Activity Route</td>
<td>Mixed function neighbourhood connector. Dual or single lane in each direction with parking lanes and service lanes (where required).</td>
<td>Balance between Access and Mobility which can be achieved through design interventions and limiting the amount of bulk available on its edges</td>
<td>Feeder buses and Midi buses. Service vehicles, local freight and private vehicles, pedestrian movement and cycling where possible. Ideally freight should be provided with alternative routes.</td>
<td>Roads designed to provide inter-neighbourhood mobility, while offering local access to land uses and facilities along its path. Roads traversing local nodes of mixed use activity and increased bulk concentration. Fed by a local bus and midi taxi system which operates as a feeder to the IRPTN system. Should connect with Multimodal facilities along its path.</td>
</tr>
<tr>
<td>ROAD</td>
<td>TYPE</td>
<td>ACCESS AND MOBILITY</td>
<td>TRANSPORT MODE</td>
<td>DESCRIPTION AND ROLE</td>
</tr>
<tr>
<td>----------------------</td>
<td>-------------------------------------------</td>
<td>--------------------------------------------------------</td>
<td>-----------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Collector</td>
<td>Duel or single lane in two directions</td>
<td>Functional Accessibility route connecting across and</td>
<td>Bus and Midi buses, local service vehicles, limited</td>
<td>Collector roads connect areas of residential concentration with each other and with areas of economic activity. Densities should be highest in close proximity to higher order collectors. Collectors can help shape identity and character by playing different roles within and between neighbourhoods and through different design treatment. Some mixed use activity around junction points. Key junctions act as gateways between neighbourhoods.</td>
</tr>
<tr>
<td></td>
<td>depending on traffic volumes, parking</td>
<td>and between neighbourhoods</td>
<td>freight mobility, private vehicles, pedestrian</td>
<td></td>
</tr>
<tr>
<td></td>
<td>lanes where required, cycling and</td>
<td></td>
<td>movement and cycling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>walking lanes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential Streets</td>
<td>Single lane in two directions, parking</td>
<td>Local Access</td>
<td>Service vehicles, private vehicles, pedestrian</td>
<td>Local streets designed for low design speeds and access to erven. Streets designed for local character and to include sharing of spaces between cars and people in areas around high density development.</td>
</tr>
<tr>
<td>and Lanes</td>
<td>lanes in high density areas, cycling and</td>
<td></td>
<td>movement and cycling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>walking lanes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Streets</td>
<td>Dual and Single lane where required,</td>
<td>Local Access</td>
<td>Freight, service vehicles, commuter, pedestrian</td>
<td>Functional roads designed to standards to cater for ingress and egress from industrial erven.</td>
</tr>
<tr>
<td>and Lanes</td>
<td>parking, cycling and walking lanes</td>
<td></td>
<td>movement and cycling</td>
<td></td>
</tr>
<tr>
<td>Heavy Rail</td>
<td>Dual (Electric and Diesel-Electric)</td>
<td>Provinc. Regional and Metropolitan mobility</td>
<td>Shared between commuter and freight</td>
<td>The rail system is a key piece of transport infrastructure connecting the Inyaninga Tongaat functional areas with the wider Metropolitan system and beyond. The rail route needs to play a strong role as a freight and commuter route. Stations are key points of access to the urban system. And key public space opportunities. In areas of high mixed use nodal activity these must link in with other transport modes.</td>
</tr>
</tbody>
</table>
### ROAD | TYPE | ACCESS AND MOBILITY | TRANSPORT MODE | DESCRIPTION AND ROLE
---|---|---|---|---
Non-Motorised Routes | Cycling paths | Local mobility and access | Bicycle | Dedicated cycle paths and lanes forming part of the road reserve, but also segregated from the road in places, such as residential collectors where space allows, and as part of the Open Space system. To accommodate daily commuting and recreational cycling.

Walking Paths | Local mobility and access | By foot | Forming part of a network of pedestrian sheds connecting residential areas and community sites, with other land use concentrations and transit nodes and transport stops, land use, transit nodes concentrations with to allow for daily connectivity and for recreation.

### Design Options:

The following cross-sections capture some options for road and street design at different levels of performance. These are provided as generic examples rather than being prescriptive. Road and street design must respond to the demands of moving people and goods, but must also consider the public role of streets as locations for social and economic interaction, and the framing of these spaces through the treatment of the street edge at the interface between buildings and streets.

**FIGURE 6: URBAN ARTERIAL**

- No parking, limited access road with two lanes in each direction. Central median, dedicated public transport, two-way cycle lane, building set back to accommodate services and/or future widening where required.
- Edge treatment with nil building line or landscaping to avoid bland walls.
FIGURE 7: MULTI-FUNCTIONAL ACTIVITY ROUTE – HIGH ACTIVITY

Multi-Functional Street - High Activity

four central lanes with median, service slip lanes with parking, pedestrian walkways, public transport, cycle lane;

colonnade - upper floors to nil building line with ground floor setback or setback with upper floors on building line; no building line (not shown)

FIGURE 8: MULTI-FUNCTIONAL ACTIVITY ROUTE – LOW ACTIVITY

Multi-Functional Street - Medium Activity

(with building line variations and colonnades)

four lanes with central median, pedestrian sidewalks, public transport and parking, cycle lane;
colonnade - upper floors to nil building line with ground floor setback, or setback with upper floors on building line, or public colonnade with upper floors on nil building line (not shown)

FIGURE 9: COLLECTOR –OPTION A

Collector Road - Suburban Development Context (Option A)

(with median and cycle lane)

four lanes, narrow pedestrian sidewalks, public transport and parking, cycle lane;

building line variations - nil building line, or building set back to accommodate services and/or future road widening
Trade-offs:

The primary trade-offs within the mobility system is between mobility and local access; mobility routes will trade access for mobility and visa-versa. However the road system must balance these competing interests across the system by creating a legible framework. Some roads operating in the urban context and along mixed use, higher routes will perform a multi-functional role by balancing these demands. These routes must function in conjunction with higher order mobility routes that facilitate regional and metropolitan mobility.
FIGURE 13: FREIGHT AND PUBLIC TRANSPORT NETWORK

- Regional Freight Route
- Local Freight Route
- Integrated Rapid Transport Route
- Integrated Rapid Transport Feeder
- Existing Rail Station
- New Rail Station
- Multi-Modal Public Transport Node

Map showing freight and public transport network with labels such as Eastern Arterial, M65, R102, M62, DUBE TRADEPORT / KSIA, and Tongaat River.
3.3 Land Use and Density Framework

A primary objective of the Inyaninga and Tongaat FAP’s is to unlock land use potential on strategic land located within the UDL and to ensure that this interfaces with the Dube Trade Port /King Shaka International Airport (DTP/KSIA) development, and that this supports and enhance this key national installation. A range of land uses will be required to support the development of an Aerotropolis region. In line with the Tongaat-DTP LAP an appropriate mix of land uses should be accompanied by a set of strategic spatial structuring tools and associated development controls to promote the development of an efficient and sustainable transit oriented development and urban form.

This design of this Land Use Framework should be guided by a set of development objectives and principles:

- Promote a mix of land uses within the FAP areas to support a range of activities within a flexible framework that can be adjusted over time in line with market trends and shifts in market demands.
- Create land use opportunities that respond principally to the primary function of the airport and Dube TradePort within the Local Area. This requires identifying an appropriate distribution of land uses in response to opportunities and constraints related to the locality of the airport. Strategic metropolitan land uses, such as industrial, business parks should be located close to the primary metropolitan mobility system and in close proximity to the airport and Dube TradePort opportunities;
- Establish a legible hierarchy of land uses located within a distribution framework that responds to connectivity and accessibility via the movement system and a spatial hierarchy of nodes that serve to cluster and concentrate land uses;
- Maximise densities in support of thresholds required for public transport, the efficient delivery of a range of services required to sustain urban communities as well as servicing the hinterland. Densities need to be distributed throughout the Land Use and Density Framework to support multiple lifestyle opportunities, diversity and to manage the interface between urban and natural areas across the Urban Development Line interface;
- Identify Special District areas which respond to future land use opportunity related to proximity to the airport;
- Promote the establishment of identifiable and discrete neighbourhoods and districts with discrete centres focused around local commercial and community activities;
- Consolidate existing infrastructure and investment in urban environments, and increase the performance of these areas to allow for higher densities and more intensive development and investment in these areas, while extending residential areas at appropriate densities;
- Utilise existing urban cores to anchor and channel growth between them;
- Utilise land availability to provide a range of housing types and densities to overcome housing backlogs in the lower market segments but to also provide housing to plan for market mobility and to satisfy a range of markets including low-income housing, social housing, affordable housing, and middle income;
- Locate higher density living environments along major local connectivity routes, in mixed use urban cores, around commercial nodes and intermodal transit nodes;
- Allow for the establishment of an appropriate range of regional and local level community facilities.

Performance:

The distribution of land uses must be designed in conjunction with the movement and accessibility framework to support the emergence of an efficient, compact urban form and in support of a better integration of work, living and recreational environments. Identifying the best use of land firstly requires balancing environmental needs with the need to create an efficient pattern of urban land use. More strategic metropolitan scale land
uses must be located close to the major movement system. The Urban Development Line must be treated as a threshold line to optimise infrastructure investment and to achieve density targets. Pedestrian sheds should be used as a baseline measure in determining land use locations in relation to key nodes. Higher order nodes containing public transport infrastructure should contain all the services required to sustain the catchment community.

**Trade-offs:**

The primary trade-off exists between the retention of agricultural land, and the preservation and rehabilitation of natural areas against the need for housing, and land uses to support productive activity and sustain population working from a relatively low baseline of economic activity. Future land use patterns need to respond to the future growth and development of the Dube TradePort and projected noise zones trading-off noise impacts with residential proximity to economic activity. Higher densities involve trade-offs between lifestyle options and access to economic opportunities, public transport, and social community services.

### 3.3.1 Residential

Residential development in the Inyaninga and Tongaat FAP’s should allow for a range of housing typologies and lifestyle choices distinguished by density and their location relative to the movement system and access to employment nodes. Residential land uses will occur in infill areas and where the conversion of existing residential to higher densities is allowed in support of compact city development and alignment with TOD principles. Residential land use must reinforce the character and function of Tongaat as a discrete settlement while allowing for expansion on its edges and densification along major local collector routes.

Residential land uses should occur in conjunction with the growth of areas of economic activity associated with expansion and consolidation of mixed use, industrial, commercial, and business areas. Likewise with careful design interventions and the definition of an open space network, residential areas should also be located in close proximity to bulk non-residential land uses, such as industrial parks and business parks. Mono-functional housing “estates” which negate integration and regional mobility should be avoided. The Tongaat and Inyaninga FAP’s align with the intention of the Tongaat-DTP LAP and the identification of four types of residential land use categories based on density:

<table>
<thead>
<tr>
<th>Intention</th>
<th>Types of Land Use Activities Permitted</th>
<th>Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Residential 1 (5-40du/ha)</strong></td>
<td>Residential&lt;br&gt;Residential Small-Holdings&lt;br&gt;Rural Residential</td>
<td>Neighbourhoods in Inyaninga and Tongaat that border the urban development line</td>
</tr>
<tr>
<td>Areas that accommodate low density residential settlement located alongside the urban development line. Within 400m of the UDL, densities of 10-15du/ha are applicable. The predominant character of these areas will be suburban.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Residential 2 (40-80du/ha)</strong></td>
<td>Residential&lt;br&gt;Places of Worship&lt;br&gt;Library&lt;br&gt;Education&lt;br&gt;Limited Commercial&lt;br&gt;Community Hall&lt;br&gt;Clinic&lt;br&gt;Administration Offices&lt;br&gt;Police Station</td>
<td>Neighbourhoods in Tongaat that surround the major public transport spines of the LA</td>
</tr>
<tr>
<td>Areas that accommodate new medium and higher density residential development suitable to support and contribute to the character of the NUDC, whilst acknowledging that some pockets of suburban development will remain over time. Primary land use is residential and where a limited number of compatible ancillary</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Intention

Types of Land Use Activities Permitted

Areas

<table>
<thead>
<tr>
<th>Intention</th>
<th>Types of Land Use Activities Permitted</th>
<th>Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community services uses which have a non-disruptive impact on neighbourhood amenity may be allowed. These areas will have a much greater mix of suburban and urban settlement character.</td>
<td>Public Transportation Facilities</td>
<td></td>
</tr>
<tr>
<td>Residential 3 (40-80du/ha)</td>
<td>Residential Hotels Places of Worship Library Education Commercial Retail Office Informal Trade Community Hall Clinic Administration Offices Police Station Public Transportation Facilities</td>
<td>Neighbourhoods in Tongaat that are located on major public transport spines of the LA</td>
</tr>
<tr>
<td>New Town (80-150du/ha)</td>
<td>Residential Hotels Places of Worship Library Education Commercial Light Industry Retail Office Informal Trade Community Hall Clinic Administration Offices Police Station Public Transportation Facilities</td>
<td>Tongaat CBD extension <em>Inyaninga Urban Core (New Town)</em></td>
</tr>
</tbody>
</table>

#### 3.3.2 Industrial

Current property trends indicate greatest demand for industrial land compared to other land uses. The study area is well placed to take up latent demand for industrial land and exploit the growth impetus and spin-offs created by the Dube TradePort. Industrial demand is expected to continue with the expansion of opportunities related the Dube TradePort and the multiplier effects associated with greater land use complexity, population growth and economic mobility. Industrial areas need to be located to take advantage of moderate topography close to major transportation infrastructure such as road arterials and rail. Connectivity between these districts and adjacent residential and commercial development nodes should be maximised to avoid homogenous areas of limited access. The wider impacts caused by industrial activity can in part be managed by channelling freight movement along designated routes to maintain general amenity and urban quality.
Industrial development must provide for a range of industrial activity within a well-defined spatial framework and a set of design guidelines that allow for the creation of quality industrial and business environments. The location of the functional area along a rail line and adjacent to the Dube TradePort, supports both road and rail based logistics. The range of industrial related land uses accommodated should include general and light manufacturing, logistics and warehousing, and business parks in order to take advantage of locality and respond to varied market demands. Heavy/Dirty Industrial land uses are excluded.

3.3.3 INTEGRATED BUSINESS PARKS (INCLUDING LIGHT INDUSTRY)

Business park (office and light industry) uses should be located adjacent to the confluence of roads providing regional mobility - the Western Bypass, Eastern Arterial, Dube Boulevard (M65), the uShukela Highway (M43), and the Vincent Dickenson (P100), to take advantage of visibility and to support economic opportunity related to the Dube TradePort. Associated land uses such as retail, short-term residential, community facilities and recreation opportunities should be integrated with business park developments (Tongaat-DTP LAP, p58).

3.3.4 MIXED USE

Mixed land uses should be encouraged to support local needs and multi-functional environments and in turn to support a sustained shift away from car-dependency and towards public transportation. The development of areas of homogenous and disconnected land uses must be avoided as these tend to increase the need for car-based mobility as a way of overcoming disconnectedness. High order land uses requiring larger thresholds and serving bigger catchments, are to be located close to mobility infrastructure. Mixed use districts should include a range of services within well-defined nodes to service populations utilising these areas. Ideally mixed use nodes should be located on connectivity routes connecting these nodes with other areas to maximise the catchment of these nodes.

3.3.5 COMMUNITY FACILITIES

The range of lifestyle choices supported in the functional areas will require an appropriate distribution of community facilities to support them. Being accessed daily by significant number of people (both children and adults), schools are central to community life. Schools should be located to maximise access and integration with the public transport networks.

3.3.6 AGRICULTURE

The expansion of the urban system and the conversion of agricultural land to residential and other land uses must be balanced with the need to preserve open space for both natural ecological services, amenity, and function but should also support the development of economic and productive opportunities in utilising open space for supplementing of food sources for poor families. Existing market gardening activities along the north coast are limited in relation to commercial sugar cane farming but play an important economic and cultural role in supplying produce variety and specific goods important to maintain cultural variety and identity associated with an Indian cultural heritage. Urban agriculture should be incorporated into the open space system to support the productive value of the system and to manage environmental quality and amenity. Urban agriculture should be encouraged at the interface between core elements of the natural system and urban land development. Some intensive agriculture linked to export production should also be encouraged in appropriate areas.

Investigation based on a finer scale of analysis is required to determine which areas within the open space system are suitable for urban agriculture usage. The intention is not to allow commercial scale mono-culture in open space, although market gardening and subsistence gardening should be supported. Market gardening should be commercially sustainable, but a framework needs to be established to support this activity. Small scale intensive agriculture with crop variety should be encouraged in locales where the natural land cover is not of primary strategic value to assist with:
The management of environmental assets and services;
To allow for environmental assets to offer productive value in addition to offering environmental services;
To contribute to visual amenity and landscape character;
To support the livelihoods and survival strategies of poorer urban communities;
To support local cultural practices in terms of crop varieties and culinary needs;
To support the production of natural medicinal plants.
4 FUNCTIONAL AREA PLAN - TONGAAT

4.1 VISION

Tongaat will play an important role as a Sub-metropolitan node supporting the growth of an aerotropolis region around the Dube TradePort and international airport. It will do this by being an important supplier of residential housing around a well located and established urban centre. At the same time it will also diversify in response to new business, commerce, industrial and logistics opportunities related to the airport and the growth of Inyaninga. Investment in a more efficient and transport orientated urban form will allow for better integration between the town and the sub-metropolitan region while creating thresholds to support a higher level of services and economic activity. Tongaat will play an important public transport role as a multi-modal public transport hub around the existing rail line. This will support Tongaat’s role as a supplier of housing with the growth of the town occurring through new local mixed density residential areas offering a wide range of housing types and a variety of lifestyle choices. Consequently, the increased choices, greater efficiencies and greater integration will allow it to play an important spatial role in supporting economic mobility. The increased residential yield and opportunities will be supported by a healthy and sustainable environment created by an integrated open space network of sufficient scale and functional value to contribute to functional, amenity, and recreational opportunities at the sub-metropolitan level.

TABLE 5: TONGAAT SUB-AREA GUIDELINES (NUDC TONGAAT-DUBE LAP 2011)

<table>
<thead>
<tr>
<th>PREFERRED ROLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecological Role</td>
</tr>
<tr>
<td>● Metropolitan environmental asset (Tongati River) providing riparian habitat and movement corridors and water management services.</td>
</tr>
<tr>
<td>● Recreational open space within mixed use areas</td>
</tr>
<tr>
<td>Economic Role</td>
</tr>
<tr>
<td>● Sub-metropolitan mixed use, business and services town centre (Tongaat CBD)</td>
</tr>
<tr>
<td>● Protection of urban development line</td>
</tr>
<tr>
<td>● Local industrial nodes</td>
</tr>
<tr>
<td>Social Role</td>
</tr>
<tr>
<td>● Regional public transport intermodal terminal</td>
</tr>
<tr>
<td>● Local mixed use, mixed density and mixed income urban living areas</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LAND USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
</tr>
<tr>
<td>● Consolidate and regenerate existing urban and suburban residential area, through protecting and enhancing the different urban lifestyle options they offer.</td>
</tr>
<tr>
<td>● Establish and promote higher density residential development along R102, within the Tongaat CBD, at neighbourhood nodes and around railway stations, in accordance with Housing and Density Framework.</td>
</tr>
<tr>
<td>● Promote compact urban form through the containment of urban sprawl (UDL) and compaction and infill in existing neighbourhoods.</td>
</tr>
<tr>
<td>● For the informal settlements, provide health and safety infrastructure as described in the Housing and Density Framework (and with additional reference to the Human Settlements Department’s Informal Settlements Programme)</td>
</tr>
<tr>
<td>● After providing health and safety infrastructure for the informal settlements, upgrade the informal settlements as described in the Housing and Density Framework.</td>
</tr>
<tr>
<td>● Establish new mixed density residential areas in undeveloped zones, in accordance with Housing and Density Framework.</td>
</tr>
<tr>
<td>Commercial</td>
</tr>
<tr>
<td>● Regenerate Tongaat CBD as a well serviced, balanced, identifiable and discrete town centre, providing a living environment of choice within close proximity to the new economic node of King Shaka Airport and Dube Trade Port.</td>
</tr>
<tr>
<td>● Consolidate existing and encourage new mixed use development, higher order commercial (retail and office), and community services and facilities at Tongaat CBD, to enhance its role of mixed business, social service and intermodal transport terminal service centre to surrounding urban and rural communities.</td>
</tr>
<tr>
<td>● Encourage compact office development within existing Tongaat CBD and existing nodes, and integrate with other land uses to create mixed use environments and to increase public transport thresholds.</td>
</tr>
</tbody>
</table>
### Create opportunities for informal trade in Tongaat CBD and other nodes through the provision of appropriate infrastructure and space.
- Consolidate and enhance mixed use development at local neighbourhood nodes, and around railway stations.
- Establish new local neighbourhood nodes within new residential areas on public transport routes, to support local needs.

### Industrial/Business Park
- Consolidate and enhance existing Tongaat South Industrial area.

### Community Facilities
- Consolidate existing community facilities in local nodes commensurate with the demographic and land use mix of the sub-area, and in line with the standards set out in the Access Mapping Report (CSIR, 2008).
- Cluster community facilities in accessible locations, on public transport routes and/or in local nodes.

### Open Space
- Protect and enhance the Tongati and Hlawe River systems and associated environmental assets as ecological corridors to ensure the delivery of ecosystem goods and services in the area.
- Protect, enhance and expand the urban park system as social amenity areas to provide active and passive recreation opportunities and facilities for the population, and to soften the effect of continuous urban settlement within the urban development corridor.

### Agricultural
- Enforce Urban Development Line by preventing any urban development expansion west of Sub-area’s western and north-western boundaries, to consolidate agricultural and rural hinterland and protect rural lifestyles.
- Agricultural activities not to encroach on Tongati and Hlawe River systems in order to ensure optimal functioning of system.

### HOUSING AND DENSITY

#### Housing Typology and Mix
- A range of housing types and tenure options should be provided to provide for different family sizes and income groups.
- Townhouses, row-houses and flats should be established in new development areas, with the exception of suburban development adjacent to sensitive environmental features (i.e. Tongati River) and the Urban Development Line.
- Within existing suburban areas, multiple dwellings (e.g. second units) should be encouraged, as well as the redevelopment of properties for townhouses, row-houses and flats.

#### Density
- A gross base density of 40 dwelling units per ha (du/ha) should be achieved within the Sub-area.
- A net density of 100-150 du/ha should be achieved within and in close proximity to the Tongaat CBD.
- A minimum net density of 80-150du/ha should be achieved within 2km of the R102, the Tongaat CBD and railway stations.
- A minimum net density of 40 du/ha should be achieved in upgrades projects, while greenfields projects should achieve net densities of 60 du/ha or more.
- A net density of 40 du/ha should be achieved in the vicinity of the Urban Development Line, taking cognisance of the local context.

### MOVEMENT AND CIRCULATION

#### Access
- Existing intersections of Ushukela Highway (M43) and Gopalal Hurban Road (R102) and new interchanges from R102 Western By Pass.

#### Road Network
- R102 Western By Pass is the regional access and linkage spine. The current Gopalal Hurban Road (R102) and the Ushukela Highway (M43) are the Metropolitan and Inter Precinct Connectors.

#### Public Transport
- The railway system with the stations Flamingo Heights, Tongaat Central and Tongaat is part of the metropolitan Primary Public Transport Corridor linking to Durban CBD in the south and to Stanger in the north.
- The road based Public Transport is projected on Gopalal Hurban Road (R102) to provide high quality public transport links to the major public transport node Tongaat Central and providing linkages to Phoenix and Pinetown / New Germany / Durban
CBD in the south. In addition road based Public Transport is projected on the R614 (Noodsberg Rd – Provincial Main Road 25) to provide links to the west.

**Internal road network of sub-area must include public transport routes in feeding to the railway stations.**

<table>
<thead>
<tr>
<th>Pedestrian Network</th>
<th>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).</th>
</tr>
</thead>
</table>

## SETTLEMENT AND ENVIRONMENTAL CHARACTER

### Built Form

- The unique built form character of the Tongaat Local Urban Node (Town Centre) should be protected and enhanced through the upgrade of the public realm, and new development or building upgrades that enhance this character.
- Built form should establish urban legibility, enhance the unique features of the area and create environments with identity and character.
- Establish new development areas and neighbourhoods with local identity and character, to avoid monotony and ‘sameness’ in the landscape.
- Built form along the R102 should enhance the role of R102 as a corridor of high landscaping and built form quality.
- Suburban built form should be established in areas adjacent to sensitive environmental features (i.e. Tongati River) and the UDL.
- Refer to the Urban Design Guidelines in section 4 of the NUDC report for detailed guidelines on residential, mixed use and business park layout and built form.

### Landscape

- Establish the R102 as a corridor of high landscape quality with respect to planting/adjacent property landscaping and built form quality.
- Regenerate and maintain high quality public realm within Tongaat CBD and other mixed use nodes to support economic role.
- Planting and landscape furniture should be established along public transportation routes, within the Tongaat CBD, and in key public places and open spaces.
- Establish and maintain a landscaping plan for the Tongaat South industrial precinct.
- Gateway features to be established at the entrance to Tongaat CBD and the Tongaat South industrial precinct.
- All public and private landscaping to be indigenous.

### Visual Amenity

- Appropriate buffer zones/development controls to be established to ensure that development adjacent to the Tongati River valley is sensitively designed.
- Protect view sheds of Tongati River/floodplains/wetlands.

## ENVIRONMENTAL SERVICES

### Environmental Services Delivery

- Recreation and human health
- Storm water management & groundwater recharge
- Food security through agricultural function and support
- Microclimatic influences for urbanising areas
- Biodiversity and species loss can be prevented through appropriate protection of riparian habitat
- Human, animal and plant migration along linear open spaces becomes possible
- Water filtering and purification can occur in functioning riparian areas
- Improvement in water quality in the dams will improve public health

### 4.2 Key Issues

Coming out of the status quo assessment a number of key issues to be addressed in the preparation of a Functional Area Plan for Tongaat have been identified:

- Existing informal settlements on the fringes of the developed area.
- Compromised natural system associated with the habitat loss in the Tongaat catchment area, with generally low levels of water quality and resulting in the Tongaat Estuary being highly degraded.
• Significant tract of grassland on the northern edge of the FAP area and identified as being of strategic environmental value.
• Tongaat is well connected to east-west linkages north of the Dube TradePort via the M43 while currently north-south regional mobility via the R102 although the R102 is constrained in the centre of Tongaat.
• Tongaat has good connectivity to national and metropolitan road infrastructure—the R102 and the N2.
• The presence of an underutilised rail infrastructure linking Tongaat with areas on the North Coast, regional urban centres in the north of Durban, and the metropolitan core.
• Tongaat is serviced by good rail infrastructure with three train stations and with good latent capacity.
• Medium to low net residential densities.
• Middle income population with reasonably good levels of education.
• Strategic location adjacent to the Dube TradePort.
• Tongaat is an important urban hub and important service area for the rural hinterland.

Tongaat is a discrete urban settlement with a vibrant economy and well defined character, although it suffers from poor levels of private and public investment and urban quality issues emanating from this.

The Functional Area Plan developed to address these issues is set out in the following plan and described thereafter.
4.3 STRUCTURING ELEMENTS

4.3.1 OPEN SPACE NETWORK

The Tongaat FAP needs to respond to the compromised state of the Tongaat environment indicated by poor catchment quality in the Tongaat and Hlawe rivers and the degraded state of the Umdloti Estuary. This environmental status quo largely results from the disruption of environmental function stemming from land cover and a pattern of urban settlement which has historically occurred without serious consideration for environmental function as well as the impacts of urban and agricultural land use. Some of these issues can be addressed by land use management and the provision of the necessary infrastructure and services – such as better management of industrial activity and better sanitation for upstream settlements. Nevertheless the FAP area must safeguard existing environmental assets while seeking to link and join what remains of a generally fragmented natural system to allow for more effective environmental services and for generating amenity and recreational value for the benefit of an expanded FAP population.

Tongaat straddles the Hlawe and Tongaat Rivers, with the Hlawe joining the Tongaat River on the north eastern edge of Tongaat settlement. The underlying natural ecological structure of the Tongaat FAP is already significantly impacted by urban development. Appropriate interventions will relate to managing land uses and development on the immediate edges of the aquatic system, landscape management - maintaining environmental quality through planting and alien species eradication, the management of activities within the constrained open space assets and the engineering of appropriate solutions for managing water runoff and the flow of water through the constrained system.

Outside the existing urban footprint, in areas suitable for urban expansion, identified environmental assets must be incorporated into a continuous open space system in which aquatic and terrestrial assets are linked. The area of North Coast Grassland on the northern boundary of the study area represents a good opportunity for contributing to the conservation of a key vegetation type and habitat and, lying adjacent to the Tongaat River, for integrating aquatic and terrestrial component of the system and thereby reinforcing greater complexity and functionality within the system. Consequently due to this land’s high potential value for conservation, amenity and function, it would be desirable that the land is ultimately acquired for open space purposes, either by the eThekwini Municipality, or a process funded as part of the environmental offsets to unlock development projects driven by the private sector within the Tongaat and Inyaninga FAP areas. However as funds are not available to implement this notion at present it has been agreed that the area will be maintained for agricultural purposes in the short to medium term, however, the land uses should acknowledge the high level of environmental services offered by the area.

4.3.2 TRANSPORT AND CONNECTIVITY NETWORK

The Transport and Connectivity Framework within the Tongaat FAP area principally responds to an existing urban form and current and future land use opportunities within it and the planned re-routing of the R102 along the western edge of Tongaat. Environmental and topographical constraints are also major determinants in structuring this network due to the hilly nature of the topography and the fragmentation caused by dissecting rivers.

4.3.2.1 MAJOR ROAD INFRASTRUCTURE

The R102 currently provides the primary north-south linkage connecting Tongaat with Verulam in the south and the M43 is also a significant link connecting the town with the N2 and M4 and Westbrook and Tongaat Beaches. The proposed re-alignment of the R102 along the Western Bypass is intended to restore the intended function of the R102 as a regional north-south mobility linkage. The Ultimate Movement and Circulation Framework prepared in terms of the Tongaat-DTP LAP align in principle with the detail indicated in terms of the Tongaat FAP transport and connectivity framework. The principle implications here are:
The re-routing of the R102 on the western edge and along the alignment indicated and with an interchange proposed providing access to Buffelskloof and Cane Growers Road in Tongaat;

The resulting change in function and role of the Gopallal Hurbens (R102) in Tongaat with the diverting of through traffic away from the CBD and onto the R102.

4.3.2.2 Public Transportation Network

The local public transport network needs to build on existing linkages within Tongaat and support the consolidation of Tongaat through both densification strategies and optimal expansion on its edges. Consequently the proposed network must align with the preparation of a land use management framework to support the network and the prioritisation of future expansion and redevelopment.

- Tongaat contains three potential multi-modal nodes located on existing rail stations. These should to various degrees link commuter rail with other feeder systems such as a local bus, midi-bus and taxi-bus services:
  - Tongaat station already functions as an important multi-modal node. Its role as a primary multi-modal public transport hub should be reinforced with the development of an integrated transport system that links the hinterland and local residential areas with the urban core, and via the multi-modal node, to the rest of the metropolitan region. The development of this node should be reinforced by concentrating public, community and social services around the node and through design and infrastructural interventions to create a safer, more pedestrian and user friendly urban environment;
  - Flamingo Station as a secondary rail station in Tongaat, functioning at a local level and linking local feeder routes within a predominantly residential urban fabric (with densities adjusted to support a more frequent and effective service. The flamingo station will also serve future expansion through Inyaninga, to the west of Tongaat, and any development here must respond to the opportunities of rail orientated public transport;
  - Tongaat Industrial to function as a third station to link residential areas further north and south with adjacent employment opportunities, and to link local residential areas with economic and servicing opportunities further afield.

- A local road based transport network (served by bus, midi bus or taxi-bus depending on future transportation strategy) with three primary routes —
  - Along Gopallal Hurbens (R102) joining the Inyaninga FAP with the Tongaat CBD and Train station and linking through to Tongaat Industrial station.
  - Along a local higher density residential corridor situated on Belvedere road and linking the CBD through the western edge of the FAP area through to the Inyaninga FAP area.
  - A new road linking the proposed Aberfoyle development, Tongaat Industrial, via Cane Growers road to Belvedere road.

- Local walking and cycling routes need to be identified at a smaller scale and in conjunction with the planning and development of public transport routes and must integrate with open space assets and public transport stops and nodes.

4.4 Land Uses Proposed

4.4.1 Urban Core

The Tongaat CBD is a vibrant commercial hub serving both the local Tongaat population and a regional catchment. This role needs to be supported through densification strategies on the edges of the urban core and specifically within a 400m radial proximity to the Rail station. Infrastructure and Urban Design interventions are required to manage the impact of traffic within the urban core and to create a more user-friendly environment with specific focus on pedestrian routes linking transit and public transport opportunities.
with concentrations of social services, retail and commercial land uses. Specific land use management proposals are dealt with in more detail within the draft scheme.

4.4.2 RESIDENTIAL
The residential strategy for the Tongaat FAP involves densification of strategic residential areas within Tongaat and the expansion of residential areas outwards from the edges of Tongaat at appropriate densities. The proposed densities fit in with the intentions of the Tongaat-DTP LAP by targeting higher densities (80 – 150 du/ha) close to transit nodes and in proximity to metropolitan, neighbourhood and local nodes. Nevertheless in existing developed areas achieving the high density targets set in terms of the LAP may be difficult to attain due to infrastructural constraints set by road reserve widths and bulk sewer capacity, and small site sizes.

4.4.2.1 HIGHER RESIDENTIAL DEVELOPMENT
The current net densities in Tongaat are in the region of 23 du/ha. Depending, or in conjunction with infrastructure upgrades, the opportunity should be given for owners or property developers to develop to the lower levels of the targets (in the region of net 80 du/ha). Practically achieving these targets requires the consolidation of properties and the conversion from single detached dwellings to row housing, townhouses and multi-level attached housing.

Higher density residential land use is targeted in the following areas:

- Central residential neighbourhoods on the edge of the urban core;
- Along Belvedere Road creating a local high density corridor in alignment with, and linking the Tongaat CBD with the Inyaninga Functional Area. The extension of Belvedere Road will link with the local collectors servicing and structuring the Inyaninga Functional Area. This corridor should be limited to a block or two depending on locality. Higher densities should be contained within blocks to allow for the creation of a legible urban form, to reduce impacts from increased bulk and height, such as shadows, on adjacent properties and to establish a clear density gradation.
- Along the edge of Gopallal Hurbans Road (existing R102), including both existing developed areas and new residential on the eastern edge of the road, and joining the Industrial land uses located in the Inyaninga FAP with the Tongaat CBD;
- The lower edges of the proposed Aberfoyle housing development to maximise on more central location and to create thresholds for local neighbourhood facilities and services west of the future R102 realignment;

4.4.2.2 MEDIUM DENSITY RESIDENTIAL
In general, and in alignment with the intentions of the Tongaat-DTP LAP, the net residential densities within Tongaat should be increased in support of attaining thresholds required to support an effective public transport system. This means increasing the average net densities from the current 23 du/ha to achieve densities to within the 40 to 80 du/ha margin. Medium density residential land use is targeted in the following areas:

- In the form of residential infill on the edges of the existing urban footprint, building on the opportunities of upgrade projects that are well located to existing infrastructure, and with public sector housing being delivered at higher densities than historically achieved.
- The upper edges of the proposed Aberfoyle housing development and reinforcing the transition towards lower densities in proximity to the UDL;
- In areas of Hambanathi Extension not affected by regional strategic environmental assets (notably the tract of North Coast Grassland identified above).
4.4.2.3 **LOW DENSITY RESIDENTIAL**

The UDL delineates an interface zone between urban and rural areas in order to protect environmental and agricultural assets and to manage the footprint of urban development and encourage more efficient use of land. Development outside of this line will not be encouraged and development within 400m of the UDL (between the UDL and the UDL Interface Line) must be restricted to between 5 and 15 du/ha. Services will not be provided beyond the UDL until such time as development pressures require this to be reviewed in the long term. Low density residential land use is targeted in the following areas:

- The north-western edge of Tongaat.
- As an extension to the Aberfoyle project to provide for a full range of housing typologies with this potential project area.

4.4.3 **AGRICULTURE**

In addition to the tract of land located in the upper Hambanathi area, there are a few smaller land portions that fall outside of the environmental buffers identified, but which are not necessarily suitable for development and are located within 400m of the UDL, or in areas which are relatively isolated and difficult to access due to topography or infrastructure barriers. These areas could be used for intensive small scale agriculture, market gardens or community gardens to support food security.

4.4.4 **LAND USE SUMMARY**

A total of **1 114 Ha** is considered developable for various land uses in the Tongaat Functional Area after the areas extracted for open space and agriculture. The open space component is a significant proportion of the total area at over 34%. The table below provides a summary of the area dedicated to the proposed land uses with an estimate of bulks that could be theoretically generated.

**TABLE 6: TONGAAT LAND USE AND BULK SUMMARY**

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Land Use Area (Ha)</th>
<th>% Area</th>
<th>Potential Floor Area (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>8</td>
<td>0.4%</td>
<td>77 360</td>
</tr>
<tr>
<td>Mixed Use</td>
<td>4</td>
<td>0.2%</td>
<td>16 720</td>
</tr>
<tr>
<td>General Industry</td>
<td>28</td>
<td>1.6%</td>
<td>168 591</td>
</tr>
<tr>
<td>Urban Core</td>
<td>23</td>
<td>1.3%</td>
<td>225 183</td>
</tr>
<tr>
<td>Mixed Use Residential (Res 1)</td>
<td>16</td>
<td>0.9%</td>
<td>150 122</td>
</tr>
<tr>
<td>Low Density Residential (Res 1)</td>
<td>111</td>
<td>6.3%</td>
<td>355 585</td>
</tr>
<tr>
<td>Medium Density Residential (Res 2)</td>
<td>464</td>
<td>26.1%</td>
<td>2 782 823</td>
</tr>
<tr>
<td>High Density Residential (Res 3)</td>
<td>102</td>
<td>5.7%</td>
<td>816 486</td>
</tr>
<tr>
<td>Secondary Education</td>
<td>52</td>
<td>2.9%</td>
<td>128 816</td>
</tr>
<tr>
<td>Primary Education</td>
<td>83</td>
<td>4.7%</td>
<td>207 374</td>
</tr>
<tr>
<td>Agriculture</td>
<td>61</td>
<td>3.4%</td>
<td>n/a</td>
</tr>
<tr>
<td>Open Space</td>
<td>614</td>
<td>34.6%</td>
<td>n/a</td>
</tr>
<tr>
<td>Level 2 Infrastructure</td>
<td>158</td>
<td>8.9%</td>
<td>n/a</td>
</tr>
<tr>
<td>Level 1 Infrastructure</td>
<td>53</td>
<td>3.0%</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1 777</strong></td>
<td><strong>100%</strong></td>
<td><strong>4 929 061</strong></td>
</tr>
</tbody>
</table>

4.4.5 **RESIDENTIAL YIELDS**

The Tongaat Functional Area has potential to provide significant future housing in close proximity to a sub-metropolitan node and the specialised Metropolitan node of Dube TradePort and the International Airport. A total potential yield of **36 266** dwelling units are possible if medium and higher densities are targeted and if the infrastructure upgrades required are possible. This equates to a population of 134 183 (based on an average occupancy rate of 3.7 people per household). Based on a current population in the region of 78 000
this represents a population increase of about 56 000. This potentially translates into 15 185 additional units distributed across both ‘greenfields’ areas and existing residential areas redeveloped to higher densities.

**TABLE 7: TONGAAT FAP COMMUNITY RESIDENTIAL YIELDS**

<table>
<thead>
<tr>
<th>Residential Zone</th>
<th>Potential Footprint (Ha)</th>
<th>Net Average Density</th>
<th>Yield (du)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed Use Residential</td>
<td>16</td>
<td>127</td>
<td>2 036</td>
</tr>
<tr>
<td>Low Density residential (Res 1)</td>
<td>111</td>
<td>8</td>
<td>833</td>
</tr>
<tr>
<td>Medium Density Residential (Res 2)</td>
<td>464</td>
<td>50</td>
<td>23 190</td>
</tr>
<tr>
<td>High Density Residential (Res 3)</td>
<td>102</td>
<td>100</td>
<td>10 206</td>
</tr>
<tr>
<td>Total</td>
<td>693</td>
<td>52</td>
<td>36 266</td>
</tr>
</tbody>
</table>

4.4.6 **COMMUNITY FACILITIES**

The Tongaat-DTP LAP indicates a major backlog in the provision of parks in the northern corridor, and identifies the need for 458ha required for local parks and 150ha for regional parks. The North Coast environmental asset located above Hambanathi presents a suitable opportunity for development of a conservation area to fulfil some of this function (much along the lines of the Stainbank Nature Reserve in the south of the Metropolitan area); however this would need to be acquired by the Municipality which is not possible at present.

In addition the LAP also indicates that 226ha will be required in the north for burial space by 2020. Some of this land needs to be provided for within the Tongaat or Inyaninga FAP areas. Suitable land needs to be identified for burial space based on closer detailed study (geotechnical and environmental studies required). In general some of the space required should be located within the footprint of the open space network indicated (but outside of wetlands and drainage lines).

4.5 **DEVELOPMENT YIELDS AND SOCIAL FACILITIES**

While Tongaat is reasonably well serviced with social facilities, population increase resulting from densification and infill will require the supply of facilities to service these communities. The table below provides a breakdown of the ultimate demand for facilities required for the Tongaat FAP based on the yields indicated above. The projected yields include both current and future requirements:

**TABLE 8: TONGAAT FAP ULTIMATE COMMUNITY FACILITIES REQUIRED (INCLUDING EXISTING)**

<table>
<thead>
<tr>
<th>Facility</th>
<th>du/facility*</th>
<th>min size</th>
<th>No. Facilities</th>
<th>Area (ha)</th>
<th>% Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crèche</td>
<td>500</td>
<td>0.035</td>
<td>67</td>
<td>2.3</td>
<td>1%</td>
</tr>
<tr>
<td>Primary Schools</td>
<td>1 375</td>
<td>3.4</td>
<td>24</td>
<td>82.9</td>
<td>37%</td>
</tr>
<tr>
<td>Secondary Schools</td>
<td>3 125</td>
<td>4.8</td>
<td>11</td>
<td>51.5</td>
<td>23%</td>
</tr>
<tr>
<td>Tertiary Education (FET)</td>
<td>7 500</td>
<td>1</td>
<td>4</td>
<td>4.5</td>
<td>2%</td>
</tr>
<tr>
<td>Neighbourhood Parks</td>
<td>750</td>
<td>1</td>
<td>45</td>
<td>44.7</td>
<td>20%</td>
</tr>
<tr>
<td>Community Parks</td>
<td>15 000</td>
<td>3.5</td>
<td>2</td>
<td>7.8</td>
<td>3%</td>
</tr>
<tr>
<td>Sports Facilities</td>
<td>15 000</td>
<td>2</td>
<td>2</td>
<td>4.5</td>
<td>2%</td>
</tr>
<tr>
<td>Market Gardens/ Allotments</td>
<td>1 000</td>
<td>0.15</td>
<td>34</td>
<td>5.0</td>
<td>2%</td>
</tr>
<tr>
<td>Community Facility/Library</td>
<td>10 000</td>
<td>0.05</td>
<td>3</td>
<td>0.2</td>
<td>0%</td>
</tr>
<tr>
<td>Cemetery</td>
<td>25 000</td>
<td>15</td>
<td>1</td>
<td>20.1</td>
<td>9%</td>
</tr>
<tr>
<td>Fire Station</td>
<td>25 000</td>
<td>0.3</td>
<td>1</td>
<td>0.4</td>
<td>0%</td>
</tr>
<tr>
<td>Police Station</td>
<td>15 000</td>
<td>0.1</td>
<td>2</td>
<td>0.2</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>224</td>
<td>100%</td>
</tr>
</tbody>
</table>
4.5.1 SCHOOLS

The application of a densification strategy with an average net density target of 50 du/ha within the Tongaat Functional Area will significantly increase the demand for future primary and high schools needed to service the expanded population. The challenge will be locating schools close to the neighbourhoods they are required to service, as insufficient land will have been reserved for educational purposes within the current footprint of Tongaat due to the inherited low density planning regime. Development through the densification of existing areas and horizontal expansion will require the delivery of new schools to support residential increase. Schools should be located in close proximity to the major local collector road network and in particular linked to future planned local public transport routes. The total potential yield with densification is 36,266 dwellings. A total of 24 primary schools and 11 high schools will be required to service this population.

**TABLE 9: TONGAAT FAP EDUCATIONAL FACILITIES REQUIRED (INCLUDING EXISTING)**

<table>
<thead>
<tr>
<th>Residential Land Use Category</th>
<th>Primary School</th>
<th>Secondary School</th>
<th>Total Education</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area (ha)</td>
<td>No of facilities</td>
<td>Area (ha)</td>
</tr>
<tr>
<td>Low Density (Res 1)</td>
<td>1.9</td>
<td>0.6</td>
<td>1.2</td>
</tr>
<tr>
<td>Medium Density (Res 2)</td>
<td>53.0</td>
<td>15.6</td>
<td>32.9</td>
</tr>
<tr>
<td>Higher Density (Res 3)</td>
<td>23.3</td>
<td>6.9</td>
<td>14.5</td>
</tr>
<tr>
<td>Mixed use urban core (Res 4)</td>
<td>4.7</td>
<td>1.4</td>
<td>2.9</td>
</tr>
<tr>
<td>Total</td>
<td>82.9</td>
<td>24.4</td>
<td>51.5</td>
</tr>
</tbody>
</table>
5 FUNCTIONAL AREA PLAN - INYANINGA

5.1 VISION

Inyaninga will play an important role as a Metropolitan industrial expansion zone and as the location of a Special District in support of the King Shaka Airport and Dube TradePort. It will offer a range of industrial, business, logistics and warehousing opportunities together with infrastructure and facilities that maximise accessibility and connectivity and support efficient multi-modal integration in the movement and production of goods. The bulk land uses will be supported by transit orientated growth centred around a small ‘new town’ mixed use urban core established on a highly accessible multi-modal public transport hub. Around this, and extending toward a clearly defined urban development line, Inyaninga will offer a range of housing opportunities in mixed density and mixed income environments in support of an economically active and mobile population. Distinctive and structured neighbourhood precincts will be supported by local mixed use areas combined with accessible social and community services and schools. A compact urban form will respond to topography with an integrated open space system offering a contiguous network of environmental assets combined in one system to function at the sub-metropolitan level in ensuring catchment health, while offering local recreational and amenity value.

<table>
<thead>
<tr>
<th>TABLE 10: INYANINGA SUB-AREA GUIDELINES (NUDC TONGAAT-DUBE LAP 2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PREFERRED ROLE</strong></td>
</tr>
<tr>
<td>Ecological Role</td>
</tr>
<tr>
<td>Economic Role</td>
</tr>
<tr>
<td>Protection of urban development line.</td>
</tr>
<tr>
<td>Social Role</td>
</tr>
<tr>
<td><strong>LAND USE</strong></td>
</tr>
<tr>
<td>Residential</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Commercial</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Industrial/Business Park</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Community Facilities</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Refer to the Land Use Guidelines in section 4 of the Tongaat Dube LAP (2011) for the range of community facilities required in the Local Area to support development up to 2030.

**Open Space**
- Protect and enhance the Mdloti River system and associated environmental assets as both a core and corridor to ensure the delivery of ecosystem goods and services in the area. This includes the preservation of the ecological function of the extensive wetlands found in the Mdloti River through the management of the outflow from the Hazelmere Dam.
- Rehabilitate, preserve and ‘widen’ the Hlawe River, associated remnant woodland features and natural grassland as a linear open space in future development scenarios, through the rehabilitation of the riverine corridor.
- Establish an urban park system to provide active and passive recreation opportunities and facilities for the population, and to soften the effect of continuous urban settlement within the urban development corridor.
- Ensure that the riverine and wetland systems are appropriately buffered from development in accordance with the Land Use Guidelines in section 4 of the Tongaat Dube LAP (2011).

**Agricultural**
- Enforce Urban Development Line by preventing any urban development expansion west of Sub-area’s western boundaries, to consolidate agricultural and rural hinterland and protect rural lifestyles.
- Existing extensive agricultural practices to continue or to be replaced by intensive agriculture, until medium term transformation to industrial, business park and urban residential development (up to 2030 or as determined by LAP review).
- Protect and enhance sustainability of high yielding agriculture areas through promotion of intensive agriculture.
- Agricultural activities not to encroach on Mdloti River system in order to ensure optimal functioning of system.

### HOUSING AND DENSITY

**Housing Typology and Mix**
- A range of housing types and tenure options should be provided to provide for different family sizes and income groups.
- Townhouses, row-houses and flats should be established in new development areas.

**Density**
- A minimum net density of 80-150du/ha should be achieved within 2km of the R102 and the Inyaninga railway station.

### MOVEMENT AND CIRCULATION

**Access**
- Existing intersections of Vincent Dickens Road (Provincial Main Road 100) and new intersections on the proposed northern spine via the proposed King Shaka International Interchange of the R102.

**Road Network**
- The Gopalal Hurban Road (R102) is the regional access and linkage spine.
- The new north-south spine, Vincent Dickens Road (Provincial Main Road 100) and the new link to the KSIA interchange on the R102 are Metropolitan and Inter Precinct Connectors.

**Public Transport**
- The railway system with a station in Inyaninga is part of the metropolitan Primary Public Transport Corridor linking to Durban CBD in the south and to Tongaat and Stanger in the north.
- The road based Public Transport is projected on Gopalal Hurban Road (R102) to provide high quality public transport links to and between the major public transport nodes in the adjacent sub-areas Tongaat and La Mercy and providing linkages to Phoenix and Pinetown / New Germany / Durban CBD in the south.
- Internal road network of sub-area must include public transport routes in feeding to the public transport 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).

### SETTLEMENT AND ENVIRONMENTAL CHARACTER

**Built Form**
- Built form should establish urban legibility, enhance the unique features of the area,
and establish local identity and character.
- Built form should create visual variety and interest, to avoid monotony and ‘sameness’ in the landscape.
- Built form adjacent to the R102 should enhance its role as a corridor of high landscaping and built form quality.
- Refer to the Urban Design Guidelines in section 4 of the Tongaat Dube LAP (2011) for detailed guidelines on residential, mixed use and business park layout and built form.

**Landscape**
- Establish the R102 as a corridor of high landscape quality with respect to planting/adjacent property landscaping and built form quality.
- Integrate major natural features as key structuring features in landscaping.
- Planting and landscape furniture should be established along public transportation routes, within the new local mixed use node, local neighbourhood nodes and in key public places and open spaces.
- Establish and maintain landscaping plans for new business park developments.
- Establish gateway feature at entrance to local mixed use node.
- All public and private landscaping to be indigenous.

**Visual Amenity**
- Significant high points and ridgelines should be sensitively treated through appropriate built form.

**ENVIRONMENTAL SERVICES**

**Environmental Services Delivery**
- Appropriate storm water management measures to be implemented in all new developed areas to manage development impacts.
- Maintenance of agricultural function to aid in food security.
- Open space elements will result in microclimatic amelioration in new developments.
- Biodiversity and species loss to be limited through rehabilitation and protection of watercourses and wetlands.
- Human, animal and plant migration to be facilitated along linear open spaces.
- The Mdloti River to continue its role in terms of water supply, return flows and utilisation systems, in relation to its position directly below Hazelmere Dam.

### 5.2 Key Issues

Coming out of the status quo assessment a number of key issues to be addressed in the preparation of a Functional Area Plan for Inyaninga have been identified:

- An existing base primarily defined by commercial agricultural land usage.
- Strategic location adjacent to Dube TradePort.
- Strategic location to the R102 with high potential for integrating north-south and east-west linkages.
- Strategic location between the urban nodes of Tongaat and Verulam which perform the role of distinct and discrete urban settlements with important middle income populations and relatively good socio-economic indicators.
- Good connectivity to national and metropolitan infrastructure – the R102 and the N2, via the M65 and M43 and an underutilised rail infrastructure linking with core metropolitan area and regional urban centres north of Durban.
- Compromised natural system associated with the Umdloti catchment area, with generally low levels of water quality.
- Significant development opportunity as a result of unconverted land located on moderate topography adjacent to existing urban development.

The Functional Area Plan developed to address these issues is set out in the following plan and described thereafter.
FIGURE 15: INYANINGA FUNCTIONAL AREA PLAN
5.3 STRUCTURING ELEMENTS

5.3.1 OPEN SPACE
The underlying natural ecological structure of the Inyaninga FAP is principally defined by the Umdloti and Hlawe river drainage systems. This drainage system provides a primary framework for determining the extent of an open space system tied to natural ecological function. The delineation of an open space system has taken the environmental constraints as hard constraints due to the unsustainable status of current environmental health particularly within the catchment areas.

Utilising the footprint of the aquatic and terrestrial environmental constraints an open space system has been created to define a system in which aquatic and terrestrial components are linked in a contiguous whole and in which linkages are created across the Mdloti and Hlawe river catchment areas. This system also attempts to maximise on opportunities of scale and to include areas of steep slope as open space.

The flatter land to the east of the FAP contains extensive wetland areas which nevertheless form part of a compromised drainage system impacted on by historical development in Tongaat. The locational factors to the Dube TradePort, the confluence of major arterials and presence of rail underlie the prime strategic value of this land to support economic development opportunities. Appropriate offsets need to be identified within the same catchment region at the level of site planning and the preparation of development applications.

5.3.2 TRANSPORT AND CONNECTIVITY NETWORK
The open space system and the movement system together represent a primary functional framework around which land use development will take hold. The transport and connectivity framework needs to function in response to environmental and topographical constraints, existing and planned infrastructure, existing urban areas, and future development opportunities related to locality, and land opportunities.

5.3.2.1 MAJOR ROAD INFRASTRUCTURE
The R102 currently provides the primary north-south linkage traversing Inyaninga and connecting Tongaat, Verulam, Phoenix, Mt Edgecombe, Umhlanga and beyond. The proposed re-alignment of the R102 along the Western Bypass and the development of an Eastern Arterial, between the Dube TradePort and Tongaat has been accommodated.

The FAP follows the proposals emerging from the LAP with the following variations:

- The movement of the location of the future interchange between the R102 and the Eastern Arterial further north to optimise opportunities associated with moderate topography adjacent to Tongaat and Dube TradePort.
- The realignment of the Eastern Arterial to be more responsive to topographic constraints, to reduce visual impact and preserve landscape character and to allow for better land use utilisation on its edges.
- Realignment of the M65/ P100 link road to be more responsive to topographic constraints and landscape quality.
- The proposal for the eastern arterial to play the role of a dedicated rapid transport route in alignment with Transportation Planning underway.

5.3.2.2 PUBLIC TRANSPORT NETWORK
Critically the FAP seeks to align future land use planning with transport planning and specifically to give consideration to the primary role of a Public Transport Framework in shaping the Functional Area. The Inyaninga FAP seeks to maximise on the opportunities for multi-modal transportation related to locality and the potential of rail, road and air linkages. Nevertheless the principle function of a public transport network
servicing the FAP is in linking local residential areas to employment, recreational and other services both locally and beyond within other core areas of the metropolitan system.

To this end, the FAP incorporates several levels of public transport:

- A dedicated rapid transport system route located on the Eastern Arterial and linking with the proposed Dube West south of Mt Moreland. Note that this aligns in principle with the proposed multimodal transit-oriented spine running through the heart of the Cornubia Development and linking with the Dube Trade Port and King Shaka International Airport as proposed through the NUDC, but deviates in terms of alignment. The Tongaat DTP LAP indicates a Public Transportation Network aligned on the future Dube West arterial and branching on Dube Boulevard with one arm continuing through the TradePort and Airport and the other arm extending on the M65, joining the Eastern Arterial and proceeding into Tongaat Central. The FAP recommends this branch occurring before Mt Moreland so that Eastern Arterial becomes the continuation of Dube West and becomes the focus of a dedicated transport system functioning at a metropolitan scale and connecting via a feeder service into local nodes. Pending further studies a light rail system is foreseen as a long term desirable option linking the Airport, Dube TradePort and urban core areas north and south of the airport due to the specific nature, character and function of a light rail service.

- A potential feeder system based on bus and midi bus in alignment with the eThekwini Municipality’s current transport planning strategy. The feeder system is to be located on higher density local movement routes and will link current residential areas and future housing with social and community facilities, urban core areas and local areas of employment as well as feeding into the metropolitan transport network by providing access to rail and to the dedicated rapid transport system.

5.3.2.3 FREIGHT LINKAGES

The Inyaninga FAP indicates significant opportunity for industrial land development. Consequently, while there appears to be some effort in shifting freight back onto rail there is the need to plan land use development in tandem with transport infrastructure to increase transport efficiencies and to minimise undesirable impacts of heavy freight movements on urban and residential spaces. The design of the road network needs to accommodate the development of an intermodal facility linked to industrial land uses and the quick and efficient movement of freight by road to the Eastern Arterial, R102 via the interchange with the Eastern Arterial, and the N2 via the M65 and the M43. The road freight movement network must also facilitate linkages with the Dube TradePort via the Tongaat-Verulam activity Route and potential future links through to the TradePort through the north-western edge of the TradePort across the Hlawe River. These linkages are important for the maintaining connectivity and accessibility across the system.

5.3.2.4 DUBE BOULEVARD (M65) EXTENSION/ P100 COLLECTOR

In line with the Tongaat DTP LAP, the M65 is proposed to link through to the P100 via a future interchange between the M65 and R102. This road will provide an important link between the hinterland via the P100 and areas of core opportunity related to the future new town urban core and those associated with the Dube TradePort and Dube City. This road will function as a collector to move traffic and public transport through primarily residential areas but will also give access to the proposed ‘new town’ urban core and local mixed use nodes at major local junctions along it. While the proposed M65/P100 link aligns with the Tongaat-DTP LAP, a geometric alignment which is more responsive to local topographical constraints is proposed for the purpose of maintaining landscape character and to allow for the optimal development of adjacent sites with opportunities for good access onto the link road. Currently the P100 functions as a Provincial road connecting the rural hinterland with Verulam and the R102. This road loops through Ndwedwe, back into Verulam via Oakford Street. It is envisaged that the road should form an important structuring role as one of
two major east west collectors serving the functional area. The P100 will over time effectively be converted to an urban road with residential development on its edges.

5.3.2.5 VERULAM-TONGAAT LOCAL ACTIVITY ROUTE
The ‘infill’ nature of the proposed Inyaninga FAP area and its locality between two well established urban centres - Tongaat and Verulam – presents the opportunity for a local activity route connecting these centres and integrating the land use opportunities between them. This road is proposed as a multi-functional road with a mix of land uses located on its edges. Essentially, however, the dual functions of access and mobility must be balanced in the performance of the road and should be managed through appropriate design of the road reserve and in managing the bulks on its edges so as to not load the access demands to the total detriment of mobility. This road should work in tandem with the Eastern Arterial which will function purely as a mobility route. The character of the road may change along it length with areas of localised land use complexity and intensity interspersed with areas of bulk land uses and larger site sizes.

5.3.2.6 HEAVY RAIL
The area of relatively flat land between the Flamingo Station and the Inyaninga Halt, presents an opportunity for a multimodal industrial facility supporting production and logistics activities within a future industrial node oriented around the existing rail line. This facility could link logistics and production facilities requiring the integration of air, sea, rail and road transportation. The viability of a multimodal facility will need to be confirmed with more detailed investigation into industrial opportunities and demand. Adjacent yards required as part of the multimodal facility may be developed either as private sidings or by Transnet if scale, demand and function justify this. In addition the current commuter line can serve as a key north-south route connecting Inyaninga and Tongaat with regions to the north (Stanger and beyond) and the metropolitan core to the south and has good potential to service demand created by residential, commercial and industrial development in the functional area.

5.3.2.7 RAIL STATIONS
With the growth of the Inyaninga Industrial node, the current Inyaninga halt should be upgraded as a commuter and freight station feeding the future Inyaninga industrial node and to provide efficient access for workers employed within this precinct.

In addition the FAP will also require the provision of a new rail station; there are strong locational factors supporting the possible coordinated and planned emergence of a ‘new town’ district at the confluence of the existing rail line, the extension of the M65 as proposed in the Tongaat- DTP LAP and linking the Dube TradePort with the P100 and the rural hinterland, and the proposed Tongaat-Verulam local activity route. A commuter rail station should be located within this node. The new station should function as a key multimodal station located at the core of a new urban node containing high density residential, retail and commercial development. This node will play a key commuter transport role by linking local housing with employment opportunities via local feeder systems, as well as employment and services and facilities accessed via an integrated future metropolitan and regional public transport system.

This node will also play an important role in linking future urban development with the rural hinterland via east - west bus and taxi routes along the P100. This node should contain 50% to 60% high density residential development to allow for thresholds to support local economic activity and to maximise on access to the rail commuter service. This urban centre is intended to complement the existing centres of Tongaat and Verulam rather than compete with them and should be planned in conjunction with the expansion of existing residential areas and the development of new residential neighbourhoods proposed. The residential component will be supported by some higher order government services and community and civic facilities supplying a wider region, as well as local retail, and commercial activity supported by the residential threshold and the commuter threshold transiting the node.
5.3.2.8 FUTURE PLANNING AND PHASING
To ensure appropriate station spacing the upgrading of the Inyaninga Halt must be planned in conjunction with the location of the proposed Inyaninga new station. The design and location should also be robust to ensure future upgrading to a multi-modal logistics park if a feasibility study confirms the demand and viability of such a facility. It is envisaged that, due to the demand for industrial land, the imperatives of job creation, and with some bulk services and road upgrades, that the Inyaninga halt would be upgraded within a shorter time horizon, while the urban ‘new town’ node will emerge over a much longer time horizon.

5.4 LAND USES PROPOSED
The Inyaninga Functional Area is currently covered predominantly by agricultural land cover. The land is strategically well placed to take up latent industrial demand created by the shortage of appropriately located flat land and housing demands in the low income, rental and affordable housing sectors. Being located between two important and discrete urban areas, Verulam and Tongaat, and the Dube TradePort/ KSIA, the Inyaninga area must be considered a strategically valuable tract of land. The proposed land uses must maximise the opportunities of locality and both current and planned infrastructure operating and benefiting the regional context. The land uses framework seeks to provide a flexible framework for guiding land use planning, development planning and infrastructure investments, while the draft scheme will generate more specific proposals around land use controls to inform the preparation of a scheme as development opportunities unfold and development becomes a reality.

5.4.1 INDUSTRIAL LAND USES
The Inyaninga FAP area contains a significant amount of land which, due to moderate topography, is well suited to industrial development. This land is nevertheless also impacted on by significant aquatic constraints. It is recommended that the industrial potential of this land is maximised and offsets are sought elsewhere in the study area (combined Inyaninga and Tongaat FAP areas). Any industrial activity would need to comply with environmental performance criteria set out in the development guidelines here, to ensure that proposed activities do not have any potential negative impact on local catchment quality due to the current poor quality of the Umdloti and Tongaat catchments. Where possible, the remnants of the environmental system should be accommodated through appropriate and sensitive engineering design solutions and landscaping.

Depending on market demands, the area identified for industrial land uses could accommodate General and Light Industrial activity. Heavy/dirt industry is to be excluded. The industrial area must contain ancillary land uses, principally some retail, commercial and business services in support of local enterprise and the working population using these spaces. Principally these land uses should be located on collector routes and in close proximity to major local nodes where they can still offer services locally while benefitting from a larger population catchment. The proposed Tongaat-Verulam Local Activity Route would be a key locality for containing ancillary land uses in support of the primary industrial land use.

5.4.1.1 MULTIMODAL INDUSTRIAL FACILITY
The presence of heavy rail and its location on a straight line adjacent to an area of relatively flat land between the Flamingo Station and the Inyaninga stop, presents an opportunity for a multimodal facility linking air, sea, rail and road and linked to the possibility of industrial activity and production. The viability of a multimodal facility will need to be determined through more detailed investigation into industrial opportunities and demand.
5.4.2 INTEGRATED BUSINESS PARK
The area immediately adjacent to the Dube TradePort boundary is impacted by the projected noise contours with the 55 LRDN noise contour penetrating approximately about 1km into the Inyaninga FAP boundary. The 55 LRDN noise contour is considered to be the threshold for sensitive developments such as residential development unless the buildings are designed to adequately address noise issues. Hotels and other short-term residential uses are possible within this threshold. The land on the eastern edge of the Inyaninga FAP is characterised by hilly topography making it less suitable for conventional industrial land uses and the larger platforms required for this. The area designated for Business Park is therefore identified for a blend of office space, industrial warehousing and light industrial activity. Some industrial manufacturing and production is considered appropriate and desirable where this activity is focused more on high tech manufacturing as well as research and development, requiring ‘clean’ production methods. Only light industrial activity should be considered in this locale. Such activity for example could be in the pharmaceuticals or electronics manufacturing sectors, tools and machinery assembly or intensive agricultural production as an extension of the Dube TradePort’s AgriZone. The focus however should be on clean industries and production processes. Associated land uses to support more integrated business park settings should be encouraged. The business park area should therefore also include retail, short-term residential, community facilities and recreation opportunities in accessible locales.

5.4.3 MIXED USE URBAN CORE (NEW TOWN)
There are strong locational factors supporting the possible coordinated and planned emergence of a ‘new town’ district at the confluence of the existing rail line, the extension of the M65 as proposed in the Tongaat-DTP LAP and linking the Dube TradePort with the P100 and the rural hinterland, and the Tongaat-Verulam local activity route as proposed here. These are supported by the metropolitan scale movement network and the R102 and the proposed Eastern Arterial. Ideally a new commuter rail station should be located at this node or the Inyaniga stop relocated to this node. This urban centre is intended to complement the existing centres of Tongaat and Verulam rather than compete with them and should be planned in conjunction with the expansion of existing residential areas and the development of new residential neighbourhoods proposed here.

The urban core is conceived principally as a mix of residential, office and retail activities with associated land such as, educational, recreation, government and institutional land uses included. It is proposed that 50% to 60% of the bulk within the urban core of this ‘new town’ should be committed to high density residential development and a mix of land uses be accommodated. This is to allow for land use diversity and densities to support higher order facilities and services in close proximity to a multimodal transit node. To achieve the urban performance targets indicated within the design guidelines, a vertical mixing of land uses should be encouraged as well as a horizontal mixing of land uses. These facilities and services should offer a mix of local services as well as regional services to support surrounding communities and the regional hinterland due to the potential for this node to form as a regional multi-modal transit/connectivity hub anchored on the establishment of a new commuter rail station (to be advised by PRASA).

5.4.4 RESIDENTIAL
In line with the Tongaat DTP LAP (2011) the Inyaninga FAP encourages a range of housing types and tenure options to allow for different family sizes and income groups. Likewise densities are seen as key to creating sustainable residential environments and in supporting an urban system in which public transport plays a primary role in connecting people to jobs as well as retail, recreational and service options needed to sustain communities within well-defined catchment zones. Commercial and retail land uses required to support local activity should be allowed within high density residential zones.
5.4.4.1 **Mixed Use Urban Core (New Town) – 80 to 150 DU/HA**

The development of a small new town urban core in Inyaninga, based around a multimodal transit node, with community and other government services and commercial opportunities should occur with a mix of residential and compatible non-residential land uses. Achieving the high densities proposed in terms of the Tongaat-DTP LAP for this residential environment (80 to 150 du/ha), at least 45% of the bulk available within the proposed urban core must be committed to residential land use. Increasing this figure to 60% increases the residential densities to a more optimal level of 128 du/ha. Housing in this locale can only be delivered in the form of attached housing, and must comply with the urban performance objectives established in the design guidelines. In part this means promoting a vertical mixing of land uses and encouraging residential development above commercial and retail opportunities located on street level. This should be achieved in addition to residential and non-residential land uses occurring side by side where row housing, townhouses and fully residential apartment blocks, define the physical form of housing. Achieving residential development with a vertical mix of uses requires strategic effort and partnerships between financial institutions, the local authorities land use management and strategic planning, public sector housing, social housing agencies and private sector developers and community. Due to urban development economics, the urban core offers little prospect for low income subsidised housing. The focus should be in delivering affordable and social housing within this locale in the form of three to four storey walk ups, row housing, and apartments (flats).

5.4.4.2 **Higher Density Residential – 80 to 150 DU/HA**

Higher density residential environments are encouraged in locations which are seen as strategically located in relation to the major movement system, public transportation and adjacent to areas of employment. This is in order to maximise on investment in infrastructure and create efficient urban structure and also attain the thresholds necessary to support public transport. The Inyaninga FAP has identified two principle locations for Higher Density Residential development. These are located on:

1) The edge of the Mixed Use Urban Core proposed, and
2) Along primary collectors carrying proposed local public transport routes (served by bus, midi bus or taxi bus) and connecting residential neighbourhoods.

The residential typologies to locate here should take the form of attached housing - semi-detached, row housing (terrace), 3-4 storey walk ups flats, and duplex complexes. Some medium rise building may be possible in the longer term close to the urban core around junction points. Other land uses required to support residential land use and allow for local economic activity should be encouraged within the higher residential zone.

5.4.4.3 **Medium Density Residential – 40 to 80 DU/HA**

The majority of housing is proposed at medium and greater residential densities. These environments should be located towards the outer edges of residential districts, providing an interface between the higher residential with the open space system. Densities here are proposed at 40 to 80 du/ha, with a range of housing typologies supporting lifestyle choices.

5.4.4.4 **Low Density Residential – 5 to 40 DU/HA**

The UDL defines a threshold space between urban and the peri-urban and rural hinterland beyond the urban edge. In support of this, it is proposed that beyond the UDL Interface residential densities are drastically limited to encourage a very low impact of development and to contain the unsustainable spread of bulk services. Densities should be maintained at 5 to 15 du/ha within 400m of the UDL (i.e. beyond the UDL Interface). Only limited infrastructure and facilities will be provided beyond the UDL. The application of the UDL will reinforce distinctions between urban and rural character with the progression from urban, suburban to peri-urban settlement patterns being very rapid between the UDL interface and UDL.
5.4.1 AGRICULTURE
A number of small tracts of land exist falling outside of the environmental buffers identified as well as beyond the UDL interface. These areas could be used for intensive small scale agriculture, market gardens or community gardens to support food security.

5.4.2 LAND USE SUMMARY
A total of 1 547 Ha is considered developable for various land uses in the Inyaninga Functional Area after the areas extracted for open space and agricultural land use. The table below provides a summary of the area dedicated to the proposed land uses with an estimate of bulks that could be theoretically generated.

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Land Use Area (Ha)</th>
<th>% Area</th>
<th>Potential Floor Area (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated Business Park</td>
<td>313</td>
<td>14%</td>
<td>1 250 203</td>
</tr>
<tr>
<td>General and Light Industrial</td>
<td>275</td>
<td>13%</td>
<td>1 647 499</td>
</tr>
<tr>
<td>Mixed Use Urban Core - New Town (non-residential mixed use)</td>
<td>25</td>
<td>0%</td>
<td>159 024</td>
</tr>
<tr>
<td>Mixed Use New Town (Residential)</td>
<td>as above</td>
<td>1%</td>
<td>238 535</td>
</tr>
<tr>
<td>Low Density residential (Res 1)</td>
<td>110</td>
<td>5%</td>
<td>352 613</td>
</tr>
<tr>
<td>Medium Density Residential (Res 2)</td>
<td>260</td>
<td>12%</td>
<td>1 560 656</td>
</tr>
<tr>
<td>High Density Residential (Res 3)</td>
<td>56</td>
<td>3%</td>
<td>449 261</td>
</tr>
<tr>
<td>Secondary Education</td>
<td>32</td>
<td>1%</td>
<td>80 375</td>
</tr>
<tr>
<td>Primary Education</td>
<td>52</td>
<td>2%</td>
<td>129 392</td>
</tr>
<tr>
<td>Tourism/recreation</td>
<td>57</td>
<td>3%</td>
<td>n/a</td>
</tr>
<tr>
<td>Open Space</td>
<td>563</td>
<td>26%</td>
<td>n/a</td>
</tr>
<tr>
<td>Agriculture</td>
<td>96</td>
<td>4%</td>
<td>n/a</td>
</tr>
<tr>
<td>level 2 Infrastructure</td>
<td>198</td>
<td>9%</td>
<td>n/a</td>
</tr>
<tr>
<td>Level 1 Infrastructure</td>
<td>136</td>
<td>6%</td>
<td>n/a</td>
</tr>
<tr>
<td>Total</td>
<td>2173</td>
<td>100%</td>
<td>5 867 558</td>
</tr>
</tbody>
</table>

5.4.3 RESIDENTIAL YIELDS
The Inyaninga Functional Area has potential to provide significant future housing in close proximity to the specialised Metropolitan node of Dube TradePort and the International Airport. A total potential yield of 22 628 dwelling units is theoretically achievable if medium and higher densities are targeted:

<table>
<thead>
<tr>
<th>Residential Zone</th>
<th>Potential Footprint (Ha)</th>
<th>Net Average Density</th>
<th>Yield (du)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed Use Residential (New Town)</td>
<td>25</td>
<td>127.2</td>
<td>3 180</td>
</tr>
<tr>
<td>Low Density residential (Res 1)</td>
<td>110</td>
<td>7.5</td>
<td>826</td>
</tr>
<tr>
<td>Medium Density Residential (Res 2)</td>
<td>260</td>
<td>50.0</td>
<td>13 005</td>
</tr>
<tr>
<td>High Density Residential (Res 3)</td>
<td>56</td>
<td>100.3</td>
<td>5 616</td>
</tr>
<tr>
<td>Total</td>
<td>451</td>
<td>50.2</td>
<td>22 628</td>
</tr>
</tbody>
</table>

5.4.4 COMMUNITY FACILITIES
The efficient and sustainable provision of social facilities to support residential quality and amenity is best achieved by clustering facilities, allowing for facilities sharing to maximise on space utilisation and by providing for these in areas of high accessibility. The residential collector network and major local junction points within this network provide for natural localities for anchoring social and community facilities, and for accommodating the range of commercial services required to support communities. Coordinating the location
of facilities in this way will support the development of a network of local nodes established on key local routes and junctions.

The backlog in the provision of parks in the northern corridor needs to be addressed through the appropriate distribution of community parks located within the open space footprint and smaller neighbourhood parks (including urban parks) within high and medium density residential areas and around local development nodes. In addition some of the future requirement for some 226ha for burial space in the North needs to be provided for within the Tongaat or Inyaninga FAP areas.

5.5 Development Yields and Social Facilities

Based on the densities proposed a total residential yield of **22 628** dwelling Units is achievable. This equates to a population of **83 724** (based on an average occupancy rate of 3.7 people per household). An appropriate number of facilities will need to be delivered with residential development. The distribution of these services is important with high order facilities being centrally located to maximise catchments. The co-location of intermediate order facilities should take place in close proximity to identified development node. Table 13 gives a breakdown of the facilities required to service the Inyaninga Functional Area community.

**TABLE 13: INYANINGA FAP ULTIMATE COMMUNITY FACILITY REQUIREMENTS (INCLUDING EXISTING)**

<table>
<thead>
<tr>
<th>Facility</th>
<th>du/facility</th>
<th>min size (ha)</th>
<th>No. Facilities</th>
<th>Area (ha)</th>
<th>% Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crèche</td>
<td>500</td>
<td>0.035</td>
<td>42</td>
<td>1.5</td>
<td>1.0%</td>
</tr>
<tr>
<td>Primary Schools</td>
<td>1 375</td>
<td>3.4</td>
<td>15</td>
<td>51.8</td>
<td>37.0%</td>
</tr>
<tr>
<td>Secondary Schools</td>
<td>3 125</td>
<td>4.8</td>
<td>7</td>
<td>32.2</td>
<td>23.0%</td>
</tr>
<tr>
<td>Tertiary Education (FET)</td>
<td>7 500</td>
<td>1</td>
<td>3</td>
<td>2.8</td>
<td>2.0%</td>
</tr>
<tr>
<td>Neighbourhood Parks</td>
<td>750</td>
<td>1</td>
<td>28</td>
<td>27.9</td>
<td>19.9%</td>
</tr>
<tr>
<td>Community Parks</td>
<td>15 000</td>
<td>3.5</td>
<td>1</td>
<td>4.9</td>
<td>3.5%</td>
</tr>
<tr>
<td>Sports Facilities</td>
<td>15 000</td>
<td>2</td>
<td>1</td>
<td>2.8</td>
<td>2.0%</td>
</tr>
<tr>
<td>Market Gardens/ Allotments</td>
<td>1 000</td>
<td>0.15</td>
<td>21</td>
<td>3.1</td>
<td>2.2%</td>
</tr>
<tr>
<td>Community Facility/Library</td>
<td>10 000</td>
<td>0.05</td>
<td>2</td>
<td>0.1</td>
<td>0.1%</td>
</tr>
<tr>
<td>Cemetery</td>
<td>25 000</td>
<td>15</td>
<td>1</td>
<td>12.6</td>
<td>9.0%</td>
</tr>
<tr>
<td>Fire Station</td>
<td>25 000</td>
<td>0.3</td>
<td>1</td>
<td>0.3</td>
<td>0.2%</td>
</tr>
<tr>
<td>Police Station</td>
<td>15 000</td>
<td>0.1</td>
<td>1</td>
<td>0.1</td>
<td>0.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>140</strong></td>
<td></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
5.5.1 Schools

Primary and secondary school facilities have significant space requirements which can be minimised through facilities sharing. This is a necessity for higher density environments where land values are at a premium. The table below indicates the distribution of educational facilities required per density zone:

**TABLE 14: INYANINGA EDUCATIONAL FACILITY REQUIREMENTS (INCLUDING EXISTING)**

<table>
<thead>
<tr>
<th>Residential Land Use</th>
<th>Primary School</th>
<th>Secondary School</th>
<th>Total Education</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area (ha)</td>
<td>No of facilities</td>
<td>Area (ha)</td>
</tr>
<tr>
<td>Low Density (Res 1)</td>
<td>1.9</td>
<td>0.6</td>
<td>1.2</td>
</tr>
<tr>
<td>Medium Density (Res 2)</td>
<td>29.7</td>
<td>8.7</td>
<td>18.5</td>
</tr>
<tr>
<td>Higher Density (Res 3)</td>
<td>12.8</td>
<td>3.8</td>
<td>8.0</td>
</tr>
<tr>
<td>Mixed use urban core (Res 4)</td>
<td>7.3</td>
<td>2.1</td>
<td>4.5</td>
</tr>
<tr>
<td>Total</td>
<td>51.8</td>
<td>15.2</td>
<td>32.2</td>
</tr>
</tbody>
</table>

The total potential yield with densification is **83 724**. A total of 22 schools will be required to support this population with **15 primary schools** and **7 high schools** required.
6 CONCLUSION

The Tongaat and Inyaninga Functional Area Plans are intended to provide a framework for guiding optimal development adjacent to the strategic opportunities related to the projected growth of an aerotropolis region. The Draft FAP's have responded to environmental constraints and opportunities as a primary determining factor in defining the suitability of land for development due to the poor environmental quality of both the Tongaat and Umdloti catchments and the need to service a projected population increase with adequate environmental services and amenity. The mobility and access frameworks respond to the significant mobility proposals emanating from the Tongaat-DTP LAP and the NUDC project work and the requirements for efficient and effective accessibility within an Aerotropolis. The NUDC proposals have been interpreted and incorporated with some minor adjustments recommended in terms of alignment and with an attempt being made to build on this work by refining an understanding of the functional roles the different components of this network will play. The proposed land uses respond to the primary demands for Housing on one hand and Industrial and related land uses, including business, warehousing and logistics on the other. The distribution of these land uses respond to the need to maximise on the opportunities for mobility and access - with higher order functions of a strategic metropolitan and sub-metropolitan nature being located centrally in relation to opportunity. Projected population figures have been projected and an assessment of facilities requirements generated from this. Potential floor areas have been projected based on indicative land uses and provisional land use controls. The information generated and the lessons learned will carry through into the Draft Scheme prepared as phase 3 of the project as well as the phasing and project plan which will be prepared in Phase 4.
7 APPENDICES

Please see separately Bound Sector Reports

7.1 PROPERTY TRENDS REPORT, KNIGHT FRANK, JULY 2012

7.2 BULK INFRASTRUCTURE REPORT STATUS QUO REPORT, VIRTUAL CONSULTING ENGINEERS, JULY 2012

7.3 TRANSPORT REPORT FOR INPUT INTO THE FUNCTIONAL PLANS, VIRTUAL CONSULTING ENGINEERS AND DAVE MACFARLANE AND ASSOCIATES, JULY 2012

7.4 ENVIRONMENTAL SECTOR REPORT, INSTITUTE OF NATURAL RESOURCE, MAY 2012

7.5 PLANNING REPORT, THE PLANNING INITIATIVE AND VIRTUAL CONSULTING ENGINEERS, JULY 2012

7.6 HOUSING AND RESIDENTIAL ANALYSIS, VIRTUAL CONSULTING ENGINEERS, JULY 2012