CORNUBIA PHASE II PLANNING REPORT

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OO GLOSSARY

This glossary is a brief description of some of the abbreviations used in this report.

- BNG- Breaking New Ground- This is an initiative by the National Department of Human Settlement's in order to establish benchmark Integrated Human Settlement developments around the country.
- BRT- Bus Rapid Transport- is a high performance public transport bus service which aims to combine bus lanes with high-quality bus 'stations', vehicles, amenities and branding to achieve the performance and quality of a light rail or metro system, with the flexibility, cost and simplicity of a bus system. (www.wikipedia.org)
- dB- Decibels- Noise contours are measured in decibels. A decibel measures sound pressure levels.
- EIA- Environmental Impact Assessment is an assessment of the possible impact, positive or negative that a proposed project may have on the environment, together consisting of the natural, social and economic aspects (www.wikipedia.org).
- ETM- eThekwini Municipality Is a Metropolitan Municipality encompassing the City of Durban and its hinterland.
- NMT- Non-Motorised Transport- This includes all forms of movement that are human powered such as cycling, walking etc. This form of movement is encouraged and shift people away from the use of private motor vehicles.
- PDA Planning Development Act The KwaZulu-Natal Planning and Development Act, 2008 (Act No. 6 of 2008) ("the PDA") directs and regulates planning and development in the Province and ensures that all planning and development decisions now occur at municipal level

(Manual on the Kwazulu-Natal Planning and Development	
Act, 2008).	

PPT- Priority Public Transport - refers to public transport services within a public transport system that are given some form of priority treatment, often in the form of rightof-way or route priority treatment, that reduces travel time and

 PT Public Transport- (based on definitions in Urban

 Public Transportation Glossary - Transportation Research

 Board 1989) – is a passenger transportation service ,

 available to any person for a prescribed fare, which is

 usually local in scope and operating over a set of routes

 from one fixed point to another.

- PWWTW- Phoenix Waste Water Treatment Works- Is a Waste Water treatment plant located along the R102 and Northern Drive.
- SANRAL- South African National Road Agency Limited-Their purpose is to maintain and develop South Africa's expanding national road network and to manage assets (www.nra.co.za).
- SASA- South African Sugar Association Is an organisation that exists to promote the global competitiveness, profitability and sustainability of the South African Sugar industry (www.sasa.org.za).
- THD- Tongaat Hulett Developments- Is a JSE listed agriprocessing business which includes integrated components of agriculture, land management and property development.

TOD-

Transport Orientated Development- A transitoriented development (TOD) is a mixed-use residential and commercial area designed to maximize access to public transport, and often incorporates features to encourage transit ridership. (www.wikipedia.org).

00 PREFACE

Approved Framework Plan

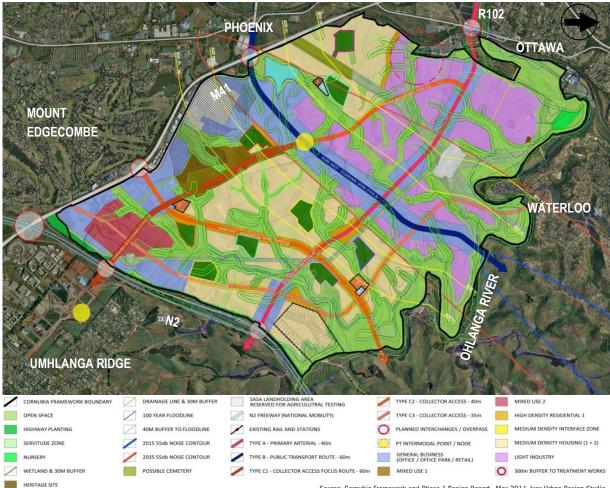
Cornubia is to become a benchmark in achieving Integrated Human Settlement and is being developed within the parameters of the National Department of Human Settlement's Breaking New Ground initiative (BNG).

The development is currently being spearheaded through a partnership between the eThekwini Municipality (ETM) and Tongaat Hulett (Pty) LTD. This partnership has been formalised via a Cooperation Agreement which spells out the key principles for the development. These principles include:

- To create value through the delivery of a balanced, economic, environmental and social return. This is to be financially viable, contributes to redressing inequalities and enhances the quality of life of the area;
- To contribute to building, consolidating and integrating the social and economic base of the region;
- To ensure a sustainable mixed use, inclusionary mixed income development that maximises the development outcomes for housing, employment as well as investment and economic opportunities.

Cornubia is a bold undertaking by both Tongaat Hulett and eThekwini Municipality with a commitment to national priorities and ideals, as well as defining and creating benchmarks for similar initiatives across the country. The primary starting point in the overall planning for Cornubia has been the establishment of a **Framework Plan** to guide and cohere future development. **The Cornubia Framework** Plan (depicted on the previous page) was **approved** by Ethekwini municipality in 2011.

The Cornubia project area measuring 1331 ha in extent, represents a strategic project jointly undertaken between the eThekwini Municipality



Source: Cornubia Framework and Phase 1 Design Report- May 2011, Iyer Urban Design Studio

00 PREFACE

(ETM) and Tongaat Hulett (Pty) LTD aimed at developing a **'mixed use' urban settlement'** comprising a range of complementary land uses. Cornubia is widely regarded as a potential key project in the search for **'Integrated Human Settlement'**. A primary project objective is the need to accommodate housing. To this end, eThekwini Municipality have acquired substantial portions of Cornubia with a view to establishing medium density housing precincts and associated social infrastructure.

The framework makes provision for **24 320 units**, of which 14 544 units are proposed for subsidised and partially subsidised housing, 4400 units identified for social and GAP housing market, and the balance earmarked for mixed use development. A diverse typology of housing has been proposed for the Cornubia Development.

The socio–economic dividends of this project is significant. The development is envisaged to create around 48 000 permanent jobs and approximately 15 000 construction jobs sustained over a 15 year period. The total estimated investment in buildings and infrastructure is R24 billion at current prices. Rates generation will amount to over R300 million per annum with other public benefits including VAT of R2,1 billion and tax receipts of a further R0,8 billion during the construction phases only. Apart from the diverse, mix of land uses, a key focus of Cornubia is on the **public realm** and a concerted effort is placed on **creating better environments** through the concepts of walkability, convenience, connectivity, increased density and sustainability.

The open space which comprises almost 29% of the site plays an important role within the overall development. Careful planning has created value by incorporating the open space within the design which is conceived in a manner that serves as a lattice that allows for **continuity for habitat and for recreational purposes.**

A significant aspect of the overall framework is a focus on **district integration** facilitated through the proposed higher order routes within the framework. A focus on **public transportation** is a key priority for the Cornubia development. The proposed Blackburn link road and Dube West have been identified as primary arterials and connect with places of significance within the region. Cornubia Boulevard East and Dube West have been identified as **Priority Public Transportation routes** intended to serve the Cornubia development as well contribute to the overall planning vision for the north.

The sharing of facilities have been proposed. In the past social facility provision has often led to over allocation of land. This has led to sterile environments being created were social facility sites and land parcels have not been developed and become alienating spaces within communities. For this reason in the planning of Cornubia, a new model has been developed with eThekwini Municipality to enable the efficient utilisation of land for social facility provision which is based on a **clustering and a shared model for facilities**.

The Cornubia Framework sets out the basic **guiding framework**, it is important to acknowledge the scale of planning and the intent at this level, which is to provide a framework at an overall level. It is anticipated that subsequent more detail levels of planning will refine the current set of proposals as evident in the **Phase 2, Land Use Management (LUM) Precinct Plan layout** presented in this report. It should be noted that such refinement will **not alter the overall intent and philosophy** of the Framework Plan but rather is a result of more detailed design. Source: Cornubia Framework and Phase 1 Design Report–May 2011, her Urban Design Studio

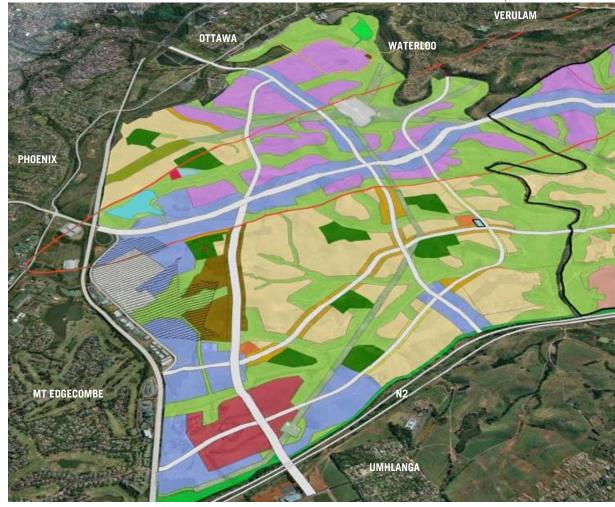
1.1 Project Background

The following represents a planning report prepared by IYER Urban Design Studio for Ethekwini Municipality and Tongaat Hullett Developments. This introductory section provides a brief background of the **Cornubia Phase 2 project** and introduces the extent of the Phase 2 Project Study Area, as well as provides a brief status of the Phase 1 developments.

Iyer's primary task was to prepare a LUM Precinct Plan (superblock layout) for Phase 2 of Cornubia. The precinct plan layout would reflect the next level of detail emanating from the framework plan such as indicating secondary, tertiary roads, defined sub-blocks, with a more refined study of housing densities and potential unit quantification. Therefore this study serves as a supporting document to provide suitable guidance to assist in obtaining a ROD for Phase 2 of Cornubia, which will then release future sub phases for detail studies and development.

This exercise is not meant to review the approved Cornubia Framework, or develop a new framework for adoption, but provide the next level of detail which includes minor amendments as a result of a logical sequencing of greater levels of detail as part of the design process. As indicated in the preface of this report, "the purpose is not alter the overall intent and philosophy of the Framework Plan. The Framework Plan represents the overall framework which will guide detailed implementation and phasing substantially in accordance with the original intent"

Perspective View of Framework



1.2 Purpose and Objectives of the Report

The purpose of this report is to provide a supportive planning motivation for the Phase 2 Precinct layout that would assist in the EIA ROD process and approval. The objectives and requirements of this phase of study are as follows:

- The project involves the preparation of a LUMS Precinct Plan layout and a supporting planning report.
- The precinct layout is to be prepared working in conjunction with the relevant engineering consultants, in this instance the team consisted of SMEC and Hatch Goba.
- The process for preparing the precinct layout is to occur in a manner that facilitates the client's participation. The process involved presenting to the project Steering Committee and bilateral's with various line departments including focus groups with individuals. Therefore an extensive internal participation and review process has occurred in preparing the Phase 2 layout over a considerable length of time.
- The current intension is that the Phase 2 layout forms the basis of an EIA, therefore a primary objective is to provide the planning and urban design basis for the Phase 2 EIA.
- The design of the precinct layout would be based on the overall objectives of the Cornubia Development Framework and would respond to the proposed land uses within Phase 2 in terms of block sizes and parameters.
- All social facility sites would have to be determined as part of this design process and documented as part of the submission.

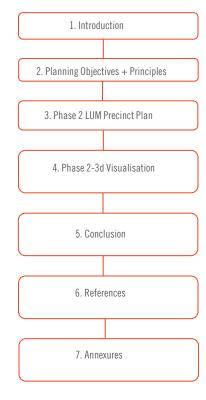
1.3 Structure of the Report

The report is structured into seven main sections. Following the introductory chapter, the second section presents the planning objectives and principles for the overall Cornubia development. Whilst this may appear to be repetitive and has already been presented at length in the previous Cornubia report, it is important to highlight the core planning objectives to ensure that these principles are not compromised in the detailing of Phase 2.

The third section focuses on the Phase 2 and provides a description of the layout, anticipated yield, proposed movement, open space, desired activity patterns etc.

The fourth section presents 3 dimensional views to illustrate Phase 2 in context with the surrounding development. It will also illustrate graphically the context of Phase 2.

The final section provides some concluding statements. After the references, a section containing a series of annexure's will elaborate on the allocation of social facilities and conceptual plans for each cluster and the housing layout and the testing of block typologies for Phase 2.



1.4 The Study Area

Cornubia lies approximately 25km from the Durban CBD and sits adjacent to Umhlanga in the east, Mount Edgecombe in the South, Ottawa in the West and Waterloo in the North. The site is strategically located along the axes of the M41 and the N2. The study area has prime visibility and potential connectivity to these major systems. Phase 1 and the Retail Park which is identified on the plan to the right are currently being implemented. Blackburn Village does not form part of the Phase 2 development as it will undergo a separate EIA process at a later stage. The next section will provide an update of both the Retail Park and Phase 1 developments.

Phase 2, the study area is identified in red on the plan to the right. Phase 2 is approximately 895ha in extent which equates to 70% of the entire 1331ha Cornubia development. A large proportion of the land has been earmarked for residential development in accordance with the approved Cornubia Framework Plan. This phase will offer significant opportunity as it contains a future mixed use town centre, retail, business park, light industrial uses as well as residential development.



1.5 Phase 1-Status

The plan on the right reflects the detailed layout for Phase 1. Phase 1 consists of the Cornubia Industrial Business Estate (CIBE), north west of the Cornubia, Phase 1a and b residential developments. The status of Phase 1 are detailed on the following page as well as the Cornubia Business and Retail Park which is undergoing a separate statutory process.



CIBE layout

1.5 Phase 1-Status

CIBE- This precinct contains business park and logistics/light industrial uses. A precinct plan with a supportive development guideline document has been prepared and approved by the municipality. Approximately 80% of the site has already been sold, and construction has started on the site.

Phase 1a- This precinct was targeted as a pilot phase for the establishment of subsidised units. 482 sites were proposed and approved via a Leftea process. Construction is completed and majority of the units are already occupied. The units are 50m2, double storey attached and signifies the starting of the first housing opportunity within Cornubia. The units are arranged around a common courtyard with the intention of landscaping the streets and local parks as can be seen on the images to the right.

Phase 1b- This area follows on from Phase 1a and it contains 2468 sites approved via a PDA process in 2012. The layout is similar to Phase 1a and is targeting the subsidised housing market. Construction has started on site.

Phase 1a- complete



1.5 Phase 1-Status

Cornubia Business and Retail Park: A Business and Retail Park precinct is proposed as a stand alone project in which both the EIA and PDA application has been approved for a portion of the General Business areas along Dube East and Cornubia boulevard. The sites will be developed for retail and business park developments due to its prime location as well as it could serve as a potential major node when the Cornubia development is fully developed. The Investec Property group plans to develop a portion of the site for retail development (illustrations on the right) and the site earthworks has already commenced.





02 PLANNING OBJECTIVES AND PRINCIPLES

2.1 Core Development Objectives

Cornubia has the potential to deliver on a range of current metropolitan development objectives given its scale and strategic location. The following are considered the core objectives:

- **District Integration**: the site represents a strategic opportunity to 'knit' together previously separated areas influenced largely through the imposition and apartheid heritage. Key in this is fostering improved linkage and integration between the surrounding communities of Phoenix, Mt Edgecombe, Umhlanga, Waterloo and Ottawa. A key development objective is therefore improved physical integration.
- Pursuing Integrated Human Settlement: given the relative unencumbered scale and Greenfield opportunity, Cornubia represents a significant opportunity to 'get the basics right' in terms of achieving integrated settlement. The core objective here is ensuring that a 'complete and livable' environment is created within which a range of economic and social opportunities are integrated with the provision of housing.
- Pursuing Sustainability: whereby the many facets of sustainability are considered carefully in the establishment of Cornubia. A key concern here is moving the sustainability agenda further than the 'green agenda'. The core objectives here are establishing a framework, management and delivery system that embraces all aspects of human settlement, the natural, social and economic environments.
- Building a Dynamic Region: based on the strategic location of Cornubia within the northern development corridor, a key objective is responding to, drawing from and growing the energy within the larger urban and particularly economic logic of the region. New

- opportunities that contribute to the broader economic competitiveness needs to be considered within the planning for Cornubia.
- Strengthening the Regional Logic of Space: an important defining quality of the site is the natural environment. This includes at a regional scale the Ohlanga River which forms an important edge of the site, the unique landform of the site, as well as the local valley systems within the site. A key objective therefore is the potential to enhance the regional lattice of open space opportunity and connectivity.

Source: Cornubia Framework and Phase 1 Design Report- May 2011, Iyer Urban Design Studio

02 PLANNING OBJECTIVES AND PRINCIPLES

2.2 Development Principles

Informed by the development objectives, the following are considered the key principles and development philosophy for Cornubia.

- Access and Structure: a key design principle at the level of the framework and at a local neighbourhood is the need to facilitate easy access, choice and convenience. At the larger framework scale, it is envisaged that a series of 'framework routes' would facilitate connectivity to the surrounding area and their respective opportunities. Equally, at a local scale, it is imperative that a robust structure is established which enables permeability and choice.
- Density and Compactness: encouraging density and compactness of settlement is a key design principle for Cornubia as these qualities provide the preconditions and threshold to support urban opportunity and choice.
- Diversity and Complexity: encouraging complexity through mixed use and intensification is critical in delivering environments that offer choice and convenience. A key design objective within Cornubia is ensuring that a wide range of urban functions are catered for within the framework. This would ensure that future residents can access a 'fuller' set of urban opportunities within close proximity.
- High Quality Urbanism: the timeless qualities of high performance built environments must be sought within Cornubia. A clear departure from conventional housing provision premised on suburban models and patterns is a firm goal of the project. The critical interplay between form and space, between building and street, between the built and un-built are important concerns of the development approach.
- Meeting Local Needs Locally: the structure of Cornubia should facilitate easy access to local needs for future residents. A key

- design objective is ensuring walkability by locating facilities and convenience retail within local neighbourhoods. At the same time, these facilities should not be embedded within the urban fabric but should be externalised and contribute to a sense of local structure and legibility. Therefore establishing local centres in places that are connected to the wider system is important.
- Public Transport and Non Motorised Transport Focus: given the thresholds targeted for the area, it is possible to achieve the required support for viable public transport. This would not only ensure that a longer term sustainability focus underpins development, but would maximise local convenience and accessibility. Non motorised transport would be viable given the density and structure sought for Cornubia.
- Access to Open Space: creating a complete environment requires access to a range of landscapes including natural and recreational. Therefore a key design objective for Cornubia is developing an integrated open space system as part of the overall urban fabric. The existing valley and wetland systems provide an important starting point in this regard. Through additional 'green' linkages a lattice of open space opportunity can be created within Cornubia. It is imperative that the establishment of the overall environment in terms of natural resources and residential amenity.
- Public Space and Facilities: a primary goal is ensuring that a complete and livable environment is created. A key ingredient to achieve this is ensuring that adequate provision is made for public facilities and developed public space.

Source: Cornubia Framework and Phase 1 Design Report- May 2011, Iyer Urban Design Studio

2.3 Application to Cornubia-Phase 11

Based on the development objectives and principles for Cornubia, how do we apply this to the Phase 2 development?

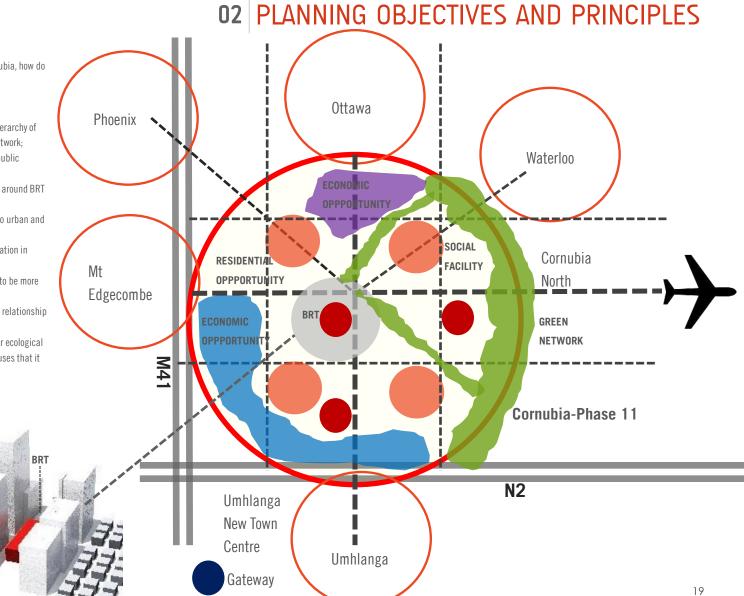
Phase 2 should encompass the following key elements;

- Integration of the surrounding context through a clear hierarchy of roads as well as ensuring permeability of the internal network;
- Design and plan for future uses that are driven around public transportation;
- The allocation of high intensity mixed used development around BRT stations;
- The inclusion of NMT and the promotion of 'walkability' to urban and social opportunity;
- Land uses must be arranged on its most appropriate location in order to capitalise and promote economic opportunity;
- Pursuing Higher densities- in order for the development to be more sustainable;
- A mix of residential types with an understanding of their relationship with one another;
- Using the green spaces more efficiently that retains their ecological benefit but also adds value and opportunity to the land uses that it surrounds;

HIGHER DENSITIES AROUND STATIONS

 Promoting clustered Social facilities that are part of the neighbourhood structure.

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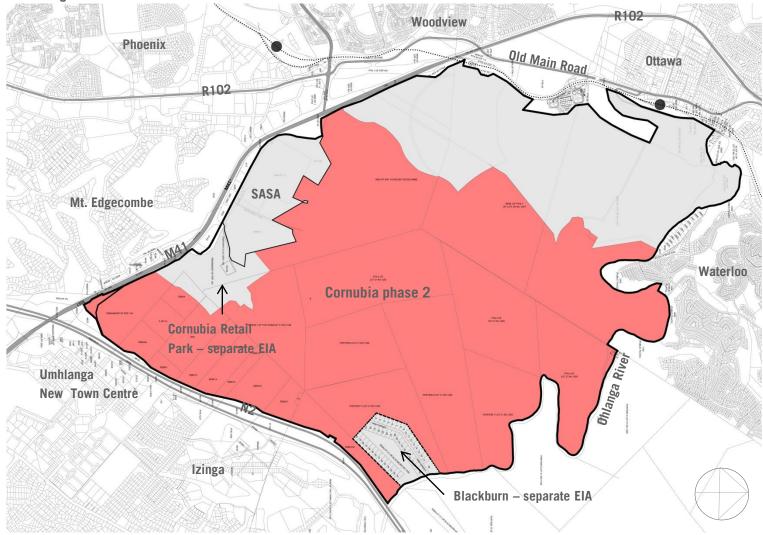


3.1 Existing Situation

The study area's northern boundary is formed by the Ohlanga River, the southern and eastern boundary is formed by the M41 and N2 respectively and the western boundary is defined along the interfaces of Phase 1. As indicated in the introductory sections of this report, Phase 1, SASA and the Retail Park, do not form part of this study however in the calculation of yield and bulk, these areas will be brought into the calculation to ensure the overall quantification is not in conflict with the previously approved layout.

The 895ha study area forms approximately 70% of the total Cornubia development. It is viewed as a strategic land parcel that will ultimately be developed once Phase 1 i.e. CIBE and Phase 1a and b residential are constructed. The Cornubia Business and Retail Park study is currently underway to develop retail and business park development. SASA and Blackburn village have been excluded from the Phase 2 development as this precinct will be subject to an individual and site specific application in due course.

Apart from the Mixed use, General Business uses along the M41 and development corridors, majority of the land has been earmarked for future residential development.



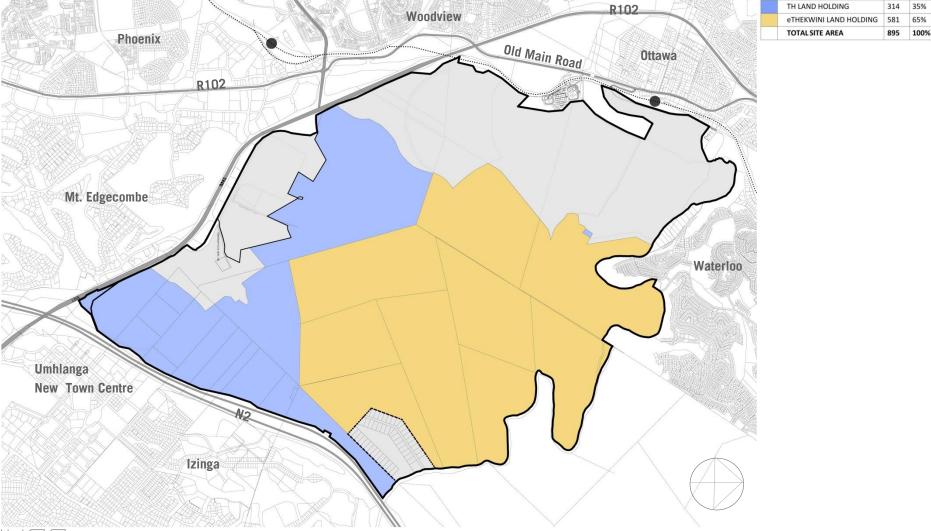
3.1 Existing Situation

3.2 Ownership

The plan to the right indicates the ownership pattern within the Cornubia project. The two dominant landowners within Phase 2 are Ethekwini Municipality and Tongaat Hulett (Pty) LTD respectively. Tongaat Hulett (Pty) LTD owns approximately 314ha of land within Phase 2. Overall Tongaat Hullett owns 586ha of land within the Cornubia Development. This portion of land is predominantly located along the M41, R102 and N2, whilst EThekwini Municipality owns 581ha of land within Phase 2 of the total 664ha for the entire Cornubia development.

A small portion of land outside the Phase 2 boundary is owned by the South African Sugar Association(SASA) which measures approximately 62ha.

eThekwini Municipality has started acquiring portions of land at Blackburn Village for future residential development. Blackburn Village will form part of a separate EIA application. The various land owners are working together to ensure that Cornubia is a sustainable 'Integrated Human Settlement'.



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3.2 Ownership

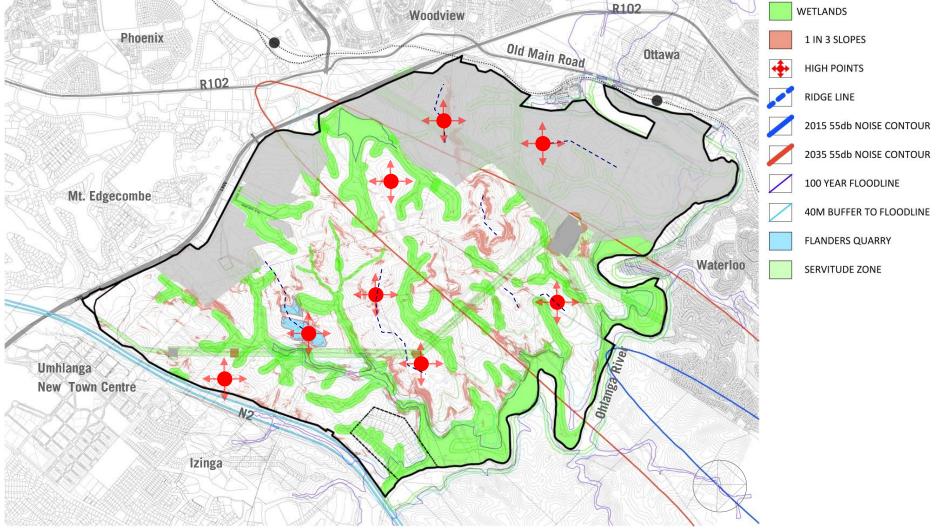
3.3 Existing Conditions and Challenges

Natural Features: The study area is characterised by steep and undulating topography, wetland areas and floodplains. A 40m buffer has been observed from the 100 year floodline and no development is proposed within this buffer. Equally, the wetlands, drainage lines and their buffers indicated as a green line on the figure on the right have been observed. Apart from the above there are numerous vantage points and ridge's which serve as an opportunity for the development. These are indicated as a red symbol and a dashed blue line on the right.

Noise Contours: The 2035 55dB noise contours have been indicated on the plan to the right. No residential development is permitted within this zone at present. A significant portion of the Ethekwini owned land is under the 2035 55db noise contour.

Servitudes: There are numerous servitudes within Phase 2. An overhead 35m transmission line servitude runs along the eastern portion of the site and into the major sub-substation. Other substations have been identified within the open space areas. Other services in particular, a 9m Northern Aqueduct pipeline servitude runs parallel to the transmission line servitude. A 10m sewer servitude runs from east to west along the site and connects with the Phoenix Waste Water Treatment Works (PWWTW). A gravity main servitude runs from east to west along the northern extent of the boundary.

3.3 Existing Conditions and Challenges



3.3 Existing Conditions and Challenges

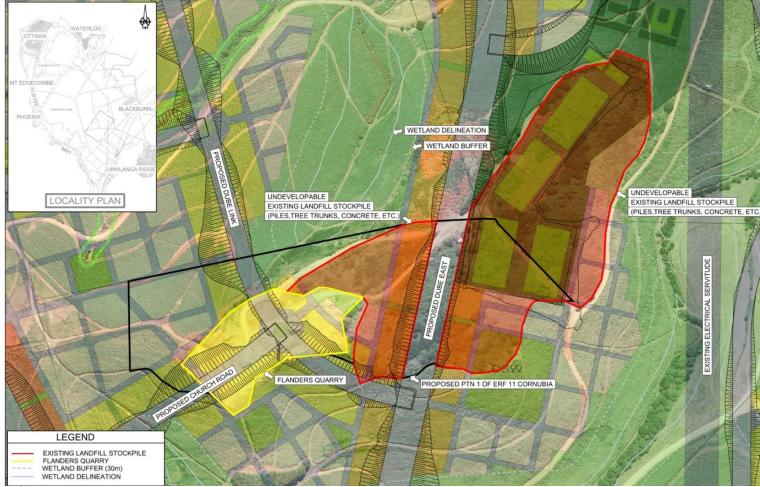
Flanders Quarry: The plan on the right indicates the extent of the Flanders Quarry. The black line illustrates the site boundary of the quarry however the yellow line indicates the extents of the actual existing quarry.

The red hatched area represents the existing landfill stockpile and is deemed undevelopable as this area is underlain by an assortment of unsuitable materials.

The recommendation by the project engineers SMEC, is that that it is not advisable to use this site for buildings. The Dube East road will be able to be constructed through the area however, this will involve substantial cut banks.

According to the project engineers, the undevelopable areas can be used for open space, parks, and sports fields, provided they are filled banks.

3.3 Existing Conditions and Challenges



Ref: SMEC

3.4 Open Space Structure

In developing the block framework, the open space was derived from the extents outlined in the approved Cornubia Framework plan, however given that the block layout is a more refined plan, minor changes have been made to the open space network. Some change has been due to the realignment of Blackburn Road and other networks related to the IRPTN project and its further detailing. This refinement in alignment is a result of a traffic engineering detailed design input. This has changed the extent of the open space previously defined. Discussions with the Ethekwini Environmental Branch has seen additional opportunity areas to be included within the overall open space areas.

The Open Space System was established through the creation of additional new 'green' linkages adopting the existing valley systems, wetlands and their buffers and steep topography as a basis. Apart from adopting the existing constraints, additional open space has been created through the design by creating more defined open space within certain portions of the layout. Consideration will be afforded to important wetland crossing areas where roads transverse over these areas. Bridge crossings and other engineering measures to ensure the continuity and ecological functioning of wetland systems will be explored at the next level of planning.

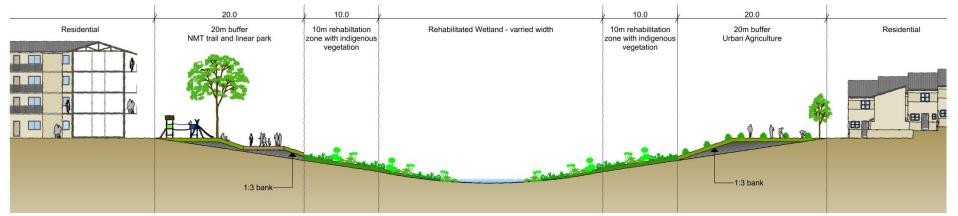
The typical section below is taken through a wetland area. The design ethos is to transform the areas within the buffer zones. It is proposed a linear park can be developed along suitable interfaces. The linear park may include seating areas, planting, NMT paths etc. In order to establish this condition, existing fill within the development could be used to develop the areas within the buffers. A 10m rehabilitation zone on either side of the buffers are retained for indigenous vegetation. On the remaining areas within the buffers, it may be conducive for agricultural productivity which could be used for small scale market/community gardens. In this way, the development is utilising the green space for recreation as well as for local production. The detailing of the concept will occur in discussions with the Ethekwini Environmental Branch in the

detail design phase.

The total extent of open space has been broken down as follows:

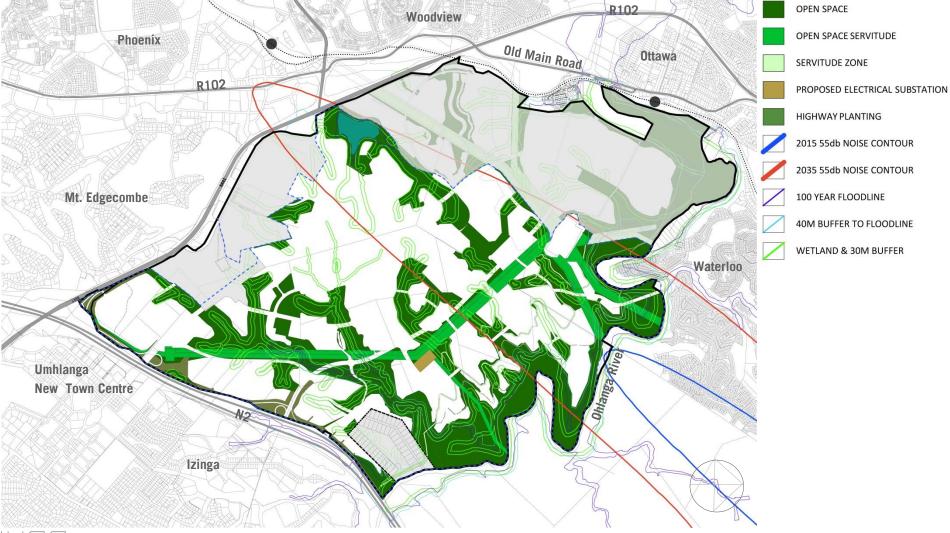
- Open Space (Wetlands , Floodplains, including their buffers) : 309ha
- Open Space(Servitudes that can be considered as open space): 55ha
- Highway Planting: 17ha
- Park/Play lot: 11.5ha

In total these open space components constitute approximately 44% of the total study area for Phase 2.



Open Space Rehabilitation Concept

3.4 Open Space Structure



3.5 Movement Structure: Description Of Networks

At a regional scale, the Cornubia framework roads still play an important role in integration of the northern areas. It is proposed that the M41/ R102 will eventually become the Western Bypass. The other significant regional connector is , "Dube West" which starts at Cornubia and continues and become the "Eastern arterial". This route crosses the Western Bypass at the vicinity of the Airport and will eventually join the R102. This route will serve as a Public Transportation Priority Route.

At a local level, the plan on the right illustrates the movement network within Phase 2 however a few refinements have been made to some of the roads that was identified in the approved Framework Plan due to engineering detail and design. The Framework Plan indicated the main framework roads only, whereas the plan on the right illustrates, the primary, secondary and tertiary routes.

One of the significant changes has been around the Blackburn interchange. Previously the interchange was situated closer to Blackburn village. It has been repositioned further south from the position indicated on the approved framework plan as per the latest engineering design. Due to the IRPTN project, a number of intersection and reserve widths had to be increased due to the Traffic Impact Assessment (TIA) dictating the number of lanes to be accommodated for through and turning movements.

Cornubia Boulevard for instance was identified as a 60m reserve in the approved Framework Plan however a 74m reserve is now proposed. There are two proposed typologies for Cornubia Boulevard which will be explained in detail on the next page. The remainder of the framework network remains principally the same.

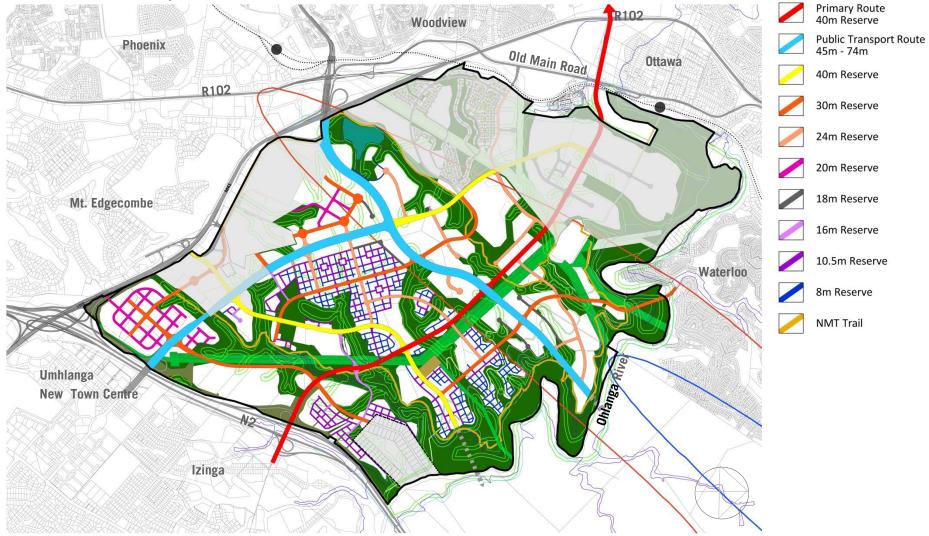
The description of the road networks are as follows,

 Blackburn link is a 40m route represents the main arterial framework road;

- Cornubia Boulevard and Dube west (Priority Public Transport Routes) are between 40 to 74m dependent on which typology is favored. These routes will serve as a mobility route with limited access;
- Cornubia Boulevard (west) has been identified as a 40m Collector Access Road;
- Dube East is a Collector with a 40m reserve which will function as an accessibility route;
- The remainder of the block layout will consist of 30m and 20m roads within the town centre area;
- 24m roads within the residential districts but also within the Industrial/ business park zones. These routes will contain NMT in the form of cycle and pedestrian paths;
- The 18m roads will occur within the industrial and business park zones; and
- The 16m- Bus route, 10,5m-Taxi collector and 8m access roads will service the residential districts.

An interchange upgrade is required at the junction between the M41 and Dube West , M41 and Flanders Drive intersection which will serve the retail part of development as well as a planned overpass at the N2 is proposed to connect with the Umhlanga New Town Centre in the east. An interchange upgrade is planned at the junction of the N2 and M41 where construction has started.

Specific NMT lanes are proposed within the open space areas. These are proposed between the wetland and buffer zones and will service the entire Cornubia development.

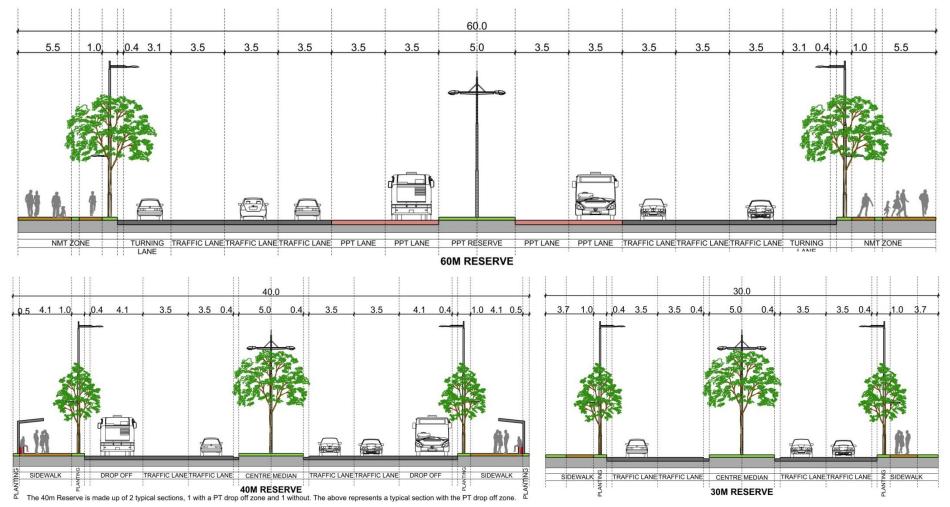


3.5 Movement Structure: Description Of Networks

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3.5 Movement Structure: Description Of Networks

The following below are typical cross-sections of the main routes.



3.5 Movement Structure: Description Of Networks

As mentioned above, both Cornubia Boulevard (east) and Dube West are Public Transportation routes. These routes will have stations that are approximately 400m apart- 5 minute walking distance from each other as depicted on the plan on the following page. These routes will contain generous sidewalks and turning lanes. Spatially the station positions are located at important junctions and connected to large main framework roads and supporting road networks. This improves the coverage of stations throughout the layout.

Around each station, Various Transit orientated development (TOD) sites are proposed. The TOD sites will contain high intensity retail and residential development in the case of the development outside the noise contour and only commercial for the TOD sites within the noise contour. These developments are predicated on public transportation and therefore minimal parking restrictions should apply.

Along the complimentary routes, Quality Bus stations have been located based on the same logic and approach as set above. At certain stations, community facility sites have been proposed.

An IRPTN depot site has been identified along Dube West.

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PRIORITY PT ROUTE R102 Woodview PT COMPLIMENTARY ROUTE Phoenix Old Main Road Ottawa PT INTERMODAL POINT / NODE R102 • BRT STATIONS \bigcirc 400m / 5 MINUTE WALKING DISTANCE TO BUS STATION • QUALITY BUS STATION 400m / 5 MINUTE WALKING DISTANCE TO QUALITY BUS STATION \bigcirc Mt. Edgecombe **IRPTN DEPOT SITE** Waterloo Umhlanga New Town Centre 00 Izinga

3.5 Movement Structure: Description Of Networks

3.5 Movement Structure: Description Of Networks

As mentioned earlier on in this section, the Cornubia boulevard reserve has increased to 74m. This was due to the TIA dictating the number of lanes to be accommodated for through and turning movements, especially along the corridor which has the highest concentration of bulks. Based on the above, two typologies for Cornubia Boulevard have been proposed which are summarised below;

Cornubia Boulevard Typology A:

Typology A contains a continuous reserve of 74m where development is located in the centre median. The development proposed is suited for Transit Orientated Development (TOD)-office/ retail which may or may not contain residential. The TOD is predicated on public transport with less reliance on parking. The objective of this option is to break down the scale of the 74m road by having development contained within the median.

The median could be designed in a manner to contain structured green spaces framed by retail opportunity. This allows the site and visual connections to be retained. The scale of buildings could also be considered to ensure no unsafe spaces are created on either side of Cornubia Boulevard. Openings or recesses within the built form could assist in avoiding continuous building facades within the median and create a street interface which is modulated and interesting.

Please note- the above typology will require further investigation and detailing at a later stage which will consider the following technical aspects such as, parking, access, circulation, ownership and financial feasibility. The typology is subject to eThekwini approval and endorsement.

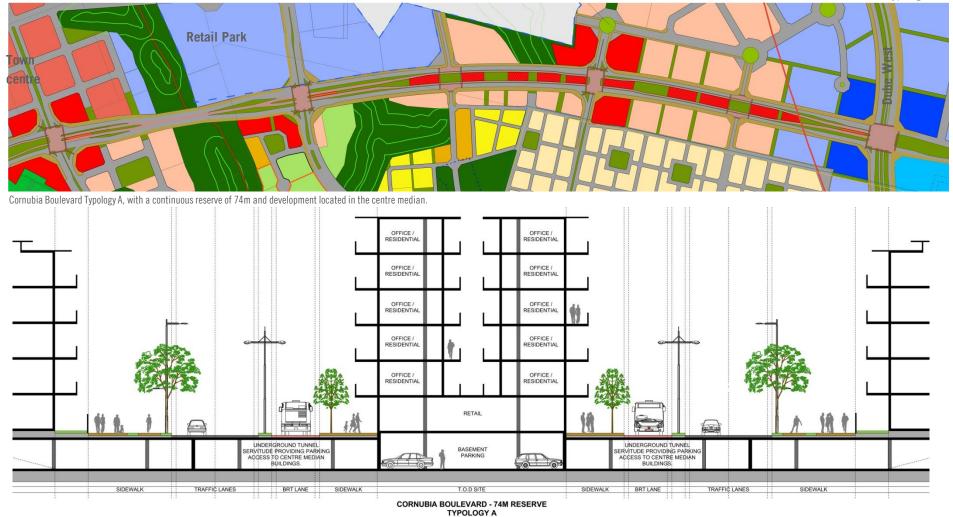
Cornubia Boulevard Typology B:

Typology B has a reserve of 74m at intersections and a reserve of 45m between the intersections. In order to ensure a more pedestrian scale or feel of road is created, the reserve was reduced to 45m where there are no stations or intersections. In this way the development along either side of the road gives the sense of a reduced width which in turn improves the pedestrian comfort and feel across the road.

Both the typologies have to be tested at a later stage in regards to their feasibility for parking, access etc. however based on the principles of good urbanism, Typology A is the preferred option.

3.5 Movement Structure: Description of Networks

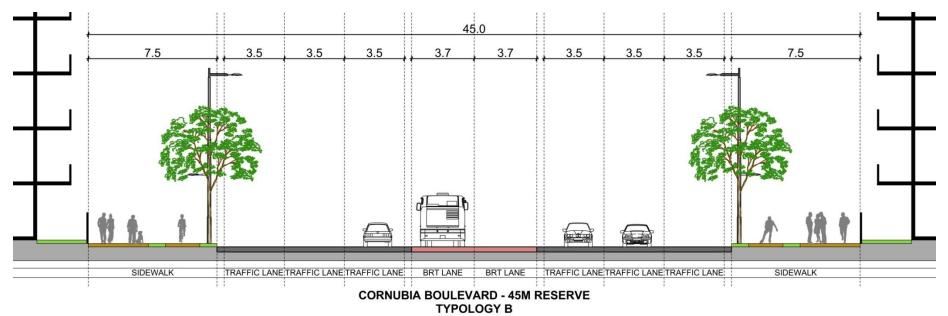
Cornubia Boulevard Typologies



3.5 Movement Structure: Description of Networks



Cornubia Boulevard Typology B, with a reserve of 74m at intersections and a reserve of 45m between the intersections.



3.6 Desired Activity Patterns

The plan on the right reflects the desired activity patterns for the Cornubia Phase II development. The brief summary below will describe each activity use independently. As described, the activity uses are "desired". The next level of planning will determine the zoning which will encompass as many desired activity uses as possible to ensure the development of Cornubia has no rigid uses imposed and that the plan remains as flexible to keep up with market trends and demands. This approach ensures the development is continuously evolving and never remains static to various development scenarios and challenges provided that the overall ethos of the Cornubia development is never compromised.

The desired activity uses are as follows;

3.6.1 General Business (offices/showrooms/retail):

This use is indicated in blue on the plan to the right. These types of uses are normally attracted to areas of high visibility and good exposure and therefore this use has been proposed along the M41 and the N2. A business corridor is also proposed within the 2035, 55db noise contour along "Dube West" which will consist predominantly of office and retail types of uses. The total extent of this zone within Phase 2, is 84ha which is 9.4% of the total area of Phase 2. A relatively low FAR of 0.8 on average with a maximum height of 6 storey's is proposed. The total bulk of approximately of 603 277m² is proposed for the General Business Zone.

3.6.2 Light Industry (Logistics/Manufacturing/Retail):

The light industrial zone is indicated in purple on the plan to the right. This use is located within the 2035,55db noise contour and is the natural extension of the CIBE located North west of the study area. It is envisaged that the types of businesses located here would include a range of logistics, light industry in line with current trends. This zone accounts for 6.6% of the total area and is 59ha in extent. An average FAR of 0.65 which yields approximately 317 527m² of bulk is proposed. This zone will generate economic opportunities for the people within Cornubia and surrounds and is well located in relation to Waterloo and Ottawa. The type of Light Industry envisaged is 'Clean and Green' industry similar to the River Horse Business Valley Estate area and the CIBE development in Phase 1.

3.6.3 Mixed Use 1 and 2:

There are two Mixed Use categories proposed for Cornubia-Phase 11. Both these categories have a proposed split of 10% retail and 90% residential however these percentages are indicative. The intention is for these zones to remain as flexible as possible to ensure the continuity of development based on market demand. 10% would be a maximum allocation of retail permissible within this zones to ensure that the bulk of the mixed use sites are residential.

Consideration may be given to a more horizontal form of mixed use within these zones. A horizontal form of mixed use means that a building could be entirely residential and the next building could be office/retail but collectively this would be considered as a mixed use precinct or neighbourhood.

The area denoted in dark orange on the plan to the right is the Mixed Use 2 area where the intention is to create a higher intensity, Town Centre environment. The intensity of development is not meant to replicate the activities around the Umhlanga New Town centre but to serve the growing catchment within Cornubia and immediate areas. The FAR within this zone will be in the region of 3.

The areas along Cornubia Boulevard denoted in the light orange hatch are Mixed Use 1 and will have a residential bias however it is envisaged over time that the ground floor may contain retail development. The intensity of mixed uses i.e. retail, residential and business's uses along Cornubia Boulevard will compliment the future BRT system proposed along Cornubia boulevard. The Mixed Use 1 activity has a FAR of 2.

The following below are a brief summary for the Mixed use 1 and 2 uses;

The Mixed Use 1 -

- 17.48 ha in extent
- Total bulk of 244 768m²
- Yield approximately 4005 units at 229du/ha
- Height -4 storey's
- Apartment sizes will vary from 55m² to 60m².

The Mixed Use 2 -

- 11.23 ha in extent
- Total bulk of 235 920m²
- Yield approximately 3539 units at a residential density of 315du/ha.
- Height- 6 storey's.
- Apartment sizes will vary from 55m² to 60m².

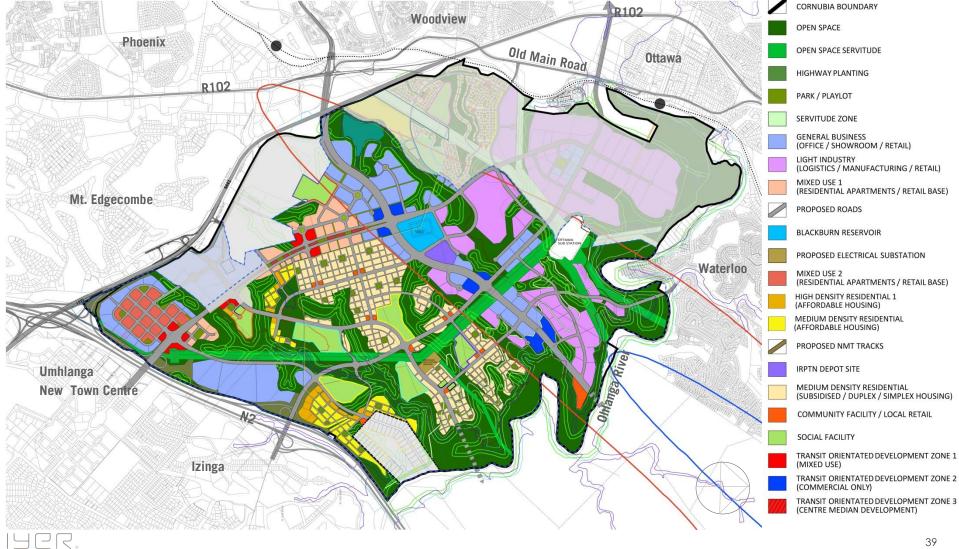
3.6.4 Medium and High Density Residential:

The following 3 residential land use categories are proposed within the Cornubia Phase2 development. A detailed residential study commissioned as part of Phase 2 has been undertaken which indicates examples for each type of residential offering, illustrates units types per category, densification of the various clusters, typical cross-sections and block layout options are attached as an annexure at the end of this report.

3.6.4.1 High Density Residential-Affordable

High Density Residential has been located along Blackburn Road, in the vicinity of Blackburn Village. The rationale behind the separate location is the relationship between the subsidised housing and rental and therefore it was necessary to identify a more distinct location for rental housing to avoid rental boycotts due to competition for subsidised housing at no

3.6 Desired Activity Patterns



3.6 Desired Activity Patterns

cost. Some High Density pockets are located within proximity of Dube East. It is envisaged that these uses would primarily permit residential development for the affordable market.

The following below is a brief summary for the High Density Residential;

- Income grouping targeted-R7001 to R15000 per month.
- Height -4 storey's
- Accounts for 0.6% of the area with a total of 5ha.
- Approximate yield of 1555 units.

3.6.4.2 Medium Density Residential-Affordable:

Specific clusters along Dube East, directly behind the High Density Development as well as at the Blackburn Village vicinity have been allocated for affordable housing in a Medium Density format. These zones could also accommodate Community Residential units (CRU's) but will be determined once further studies or research have been completed.

The following below is a brief summary for the Medium Density Residential Use;

- Income grouping targeted-R7001 to R15000 per month-fall in the bracket of partially subsidised housing.
- Height -2 to 3 storey's

- Accounts for 1.7% of the total study area and 16% of the total residential for Phase 2.
- Approximate yield of 3494 units.

3.6.4.3 Medium Density Residential Subsidised /Duplex /Simplex Housing:

A large portion, 29% of the residential allocation within the Cornubia site has been allocated for Medium Density Residential. This is indicated as light yellow on the plan on the previous page. The Medium Density is similar in format to that which is currently being established for Phase 1a and b where it involves attached double storey units around a central courtyard has been developed. The block layout indicates the layout form and pattern however this will be detailed in further studies as the phases are released.

The following below is a brief summary for the Medium Density Residential Use;

- Income grouping targeted: R0 R3,500, R0 R7000 -subsidised housing
- Density: 110 du/ha
- Height -2 storey's-row or duplex housing typologies
- Accounts for 6.6% of the total study area
- Approximate yield of 6447 units

Together all the residential for Phase 2 excluding the mixed use activities, and TOD sites, yields approximately 11497 units. This equates to 52% of all residential allocated in Phase 2 apart from the exclusions indicated above.

3.6.5 Transport Orientated developments (TOD):

At key intersections, and where BRT stations have been proposed, Transport Orientated Development (TOD) sites have been identified which are approximately 400m from one another. The TOD sites have been located so all key local access roads connect with them. This ensures that there are adequate coverage across the entire development and they are easily accessible. The TOD sites have a high intensity of uses focused around a station. These sites would consist of either commercial/retail or residential uses that capitalises on the high levels of foot traffic and activities generated at the stations.

This use is split into 3 parts,

 TOD 1 -Mixed use which permits residential as well as a commercial component. Has a FAR of 5. TOD 1 is denoted as red on the Phase 2 plan and yields 2808 units;

- TOD 2 -Commercial only, which is strictly commercial and limited to TOD sites that fall within the 2035 55dB noise contour. Has a FAR of 3. TOD 2 is denoted as blue on the Phase 2 plan;
- TOD 3-Centre Median- should this typology be approved, permits commercial and residential development. Has a FAR of 2.5. TOD 3 is denoted as red/grey on the Phase 2 plan and yields 285 units.

The TOD sites will provide the Public transport network with adequate densities/thresholds i.e. residential or retail required to sustain and support the operations of the BRT. In the same token, reduced parking standards are proposed for the TOD sites due to its location along a BRT network.

In total, **22 134 units** are proposed for Phase 2. Combined with Phase 1, a total residential yield of **25 695 units** are proposed for the entire Cornubia development.

3.6.6 Social Facilities:

The description below is a brief summary of the social facilities provided for Phase 2. An in-depth assessment with the provision of each type of facility/cluster is provided in Annexure A attached to this report. Also contained in the annexure is conceptual layouts for each social facility cluster within Phase2.

The approach taken in developing the overall Cornubia Framework was to promote a more compact urban form of development and therefore the traditional standards for facilities were reviewed. This approach has continued in developing the social facilities for Phase 2, in fact very little has changed from the original plan apart for the locations of some of the clusters based on a refinement of the plan. Social Facility clusters have been located generally within the flatter portions of the site and at key interceptory points however given that Cornubia has steep and undulating topography, many of these locations will need engineering design of some

3.6 Desired Activity Patterns

sort when developed. These clusters have been located at key intersections and prominent positions within Phase 2 so that there is adequate coverage to all residential areas. Some of the uses that are contained within the clusters which vary between each other are Libraries, Community Halls, Clinics and Sports fields. The location of the facilities are based on the concept of walkability aimed at distributing schools and other facilities within a 5 minute walk.

A ratio of two primary schools for every high school has been utilised. The total amount of schools and other facilities required for Phase 2 has been determined by estimating the total number of units for the entire development i.e. Phase 1 and 2 which is in the region of 25 695 and applying a household size of 4, yields a total design population of 103 000 and then applying the eThekwini standards for social facility provision.

Sites for standalone facilities such as Police stations, Fire stations, Community Health Centres have been identified primarily along main routes and at prominent intersections. Areas have been allocated within specific uses to accommodate facilities such as Children's home, Tertiary Training facilities and Old age Home as these will occur as and when the need arises. A site was identified in the earlier planning of Phase 2 for a cemetery however it was deemed unsuitable due to geo technical studies therefore a suitable cemetery site must be identified within the northern Corridor.

Local retail or commercial Community facility sites are proposed at key intersections across the layout for Phase 2. These are denoted as a dark orange fill within the layout. These sites occur along prominent local access roads at key intersections to serve the residential areas and are within a comfortable walking distance. These will provide local level community services and can range from local shops/takeaways to smaller community centers.

Apart from the sportfields within each social facility cluster, local parks have been created through the design. These occur at strategic areas within the residential clusters and are designed in a manner so that they can be accessed by all residents by connecting them to key local access roads. Other local courtyards will occur through detail design and are not reflected on the superblock layout however in Annexure B, local parks are indicated in an example of a typical residential block layout.

3.6.7 Informal Trading

It is most likely that these activities will occur where there are a constant flow of foot traffic. It's most likely these activities will occur around public transport areas (BRT stations, depots, drop/off pick up points)retail or employment areas such as industry. The identification of areas for trading and depots must be through a managed process.

3.7 Bulk and Density Controls

The table on the next page reflects the total bulk and yield for Phase 2.

The following below is a brief summary:

- The General Business use has a total bulk of 603 277m² at an average FAR of 0.8;
- Light Industry has a total bulk of 317 527m² with an FAR of 0.65;
- The Mixed Use 1 category yields a mixed use split with a commercial bulk of 24 477m² and a residential bulk of 220 921m². Mixed Use 1 yields 4005 units;
- Mixed Use 2 has a commercial bulk of 23 592m² and a residential bulk of 212 328m². Mixed use 2 yields 3539units;
- The total residential bulk for both Mixed use 1 and 2 in the region of 432 619m². The Mixed use 1 and 2 category caters for the over R15000 income category designated for sectional title units. Together over ±7500 units are proposed;
- The High Density Residential use has an average apartment size of 55m² and yields approximately 1555units with a residential density of 309 du/ha. The High Density Residential is targeting the R7001- R15000 income category;
- The Medium Density (Affordable housing) will yield approximately 3494 units at a residential density of 232 du/ha with an average unit size of 55m². This use will target the R7001-R15000 income category and will largely encompass partial subsidised units;
- The Medium Density (Subsidised/Duplex/ Simplex housing) accommodates the R0 - R3500 and R0 to R7000 income category. This will encompass fully subsidised units of approximately 6447 units at 110du/ha with an average unit size of 50m²;
- The Transit orientated sites (TOD) TOD 1 and TOD 3 yield 2808 and 285units respectively. TOD 1 does not contain residential.

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The total number of units proposed for Phase 2 is approximately 22 134 units. An additional 3561 units was created in Phase 1 which brings the total to 25 695 units. Applying a ratio of four people per unit, generates a population estimate of 102 780 people over the full development of 1331 hectares of land.

In establishing the social facility requirements, a design population of 103 000 people has been used.

The remaining uses within Phase 2 are as follows;

Social Facilities:	44.24ha
Servitudes:	9.20ha
Open Space:	308.83ha
Open Space Servitudes:	55.38ha
Highway Planting:	17.29ha
Parks:	11.50ha
Community Facility:	4.04ha
Reservoir:	9.45ha, and
Roads:	165.67ha

In summary, the total development yield for Phase 2 is approximately **2,588,000m2** with the split of **1,376, 000m2** of commercial which includes the industrial use and **1,213,000m2** for residential.

<u>Please note</u>: The figures above are global figures and for clarity have been rounded off.

3.7 Bulk and Density Controls

LAND USE CATEGORY & QUANTIFI						RESIDENTIAL YIELD					
Use	Gross Developable Area(Ha)	Income Level	%	Proposed Average FAR	Total Bulk	Total Commercial Bulk	Total Residential Bulk	Size of unit (sqm)	Residential Density (du/ha)	Yield : no of units	
	50.01	R0 - R3500 &			010 507		010 507	5.0	110	0.447	
Medium Density Residential - Subsidised Duplex / Simplex Housing (BNG)	58.61	R0 - R7000	6.6	0.6	316,507		316,507	50	110	6,447	
Medium Density Residential - Affordable	15.07	R7001 - R15000	1.7	1.5	192,196		192,196	55	232	3,494	
High Density Residential - Affordable	5.03	R7001 - R15000	0.6	2.0	85,511	04.477	85,511	55	309	1,555	
Mixed Use 1 (Residential Apartments + Retail Base) - 90% / 10% desired split)	17.48	>R15000	2.0	2	244,768	24,477	220,291	55	229	4,005	
Mixed Use 2 (Residential Apartments + Retail Base) - 90% / 10% desired split)	11.23 5.35	>R15000	1.3	3	235,920 187.215	23,592 18,721	212,328 168,493	60 60	315 525	3,539 2.808	
T.O.D 1 zone Mixed Use (With Residential) (90% / 10% desired split) T.O.D 2 zone Commercial Only (No Residential)	8.31	>R15000		3.0	211,823	211,823	108,493	60	525	Ζ,δυδ	
T.O.D 2 zone Commercial Only (No Residential) T.O.D 3 zone - Centre Median Development (50% / 50% desired split)	1.61		0.9	2.5	34,257	17,128	17,128	60	177	285	
General Business	83.79		9.4	0.8	603,277	603.277	17,128	60	1//	280	
Light Industry	58.86		9.4 6.6	0.65	317.527	317.527					
Social Facilities	44.24		4.9	0.85	110,601	110,601					
Community Facility	44.24		0.5	0.23	24259	24.259					
Transport: IRPTN Depot Site	3.75		0.3	0.65	24233	24,235					
Open Space	308.83		34.5	0.05	24332	24,332					
Open Space Open Space Servitudes	55.38		6.2								
Highway Planting	17.29		1.9								
Parks	11.50		1.3								
Servitudes	9.20		1.0								
Blackburn Reservoir	9.45		1.1								
Roads	165.67		18.5								
TOTAL - PHASE 2	895		10.0		2.588.252	1.375.797	1,212,455			22.134	1
Phase 1 A - Subsidised Housing - Approved	6.10				_,000,101	.,,	.,,			486	
Phase 1 B - Subsidised Housing - Approved	33									2.186	
Phase 1 B - Medium density Residential - Gap / Social Housing	1		+	0.9			8.899	55	160	158	
Marshall Dam Residential	9			0.45			40.500	55	100	731	
Cornubia Industrial and Business Estate - Approved	106			0.6		460.000					
Cornubia Retail Park - (Separate EIA)	34			0.6		169.500					
Phase 1 Open Space (Wetlands, buffers, steep areas and additional space)	113										
Phase 1 Parks and Playlots	3										
Phase 1 Servitudes	32										
SASA - Landholdings - (Excludes wetland area - Total SASA area 62Ha)	51										
SASA Open Space	11										
Blackburn Extent	28										
Ottawa Electrical Substation	9										
TOTAL - REMAINDER OF CORNUBIA	436				678,899	629,500	49,399			3,561	

3.8 LUM Precinct Plan Summary

The plan on the next page reflects the Cornubia Phase 2 layout. As indicated in the introductory section, the overall intent and philosophy of the approved layout has remained intact however the block layout out of necessity has provided a greater level of detail to test and develop in particular the housing options further in order to provide the detail necessary for the EIA application.

It is evident from the plan that there is a very clear hierarchy of routes that have been created, a permeable movement network that offers a myriad of choice to its users.

At key intersections important uses have been proposed such as TOD sites, social facility clusters and individual facilities. These are all within a comfortable walking distance which makes the layout very accessible, with less reliance on vehicles and more emphasis on public transport (BRT) and NMT such as walking and cycling.

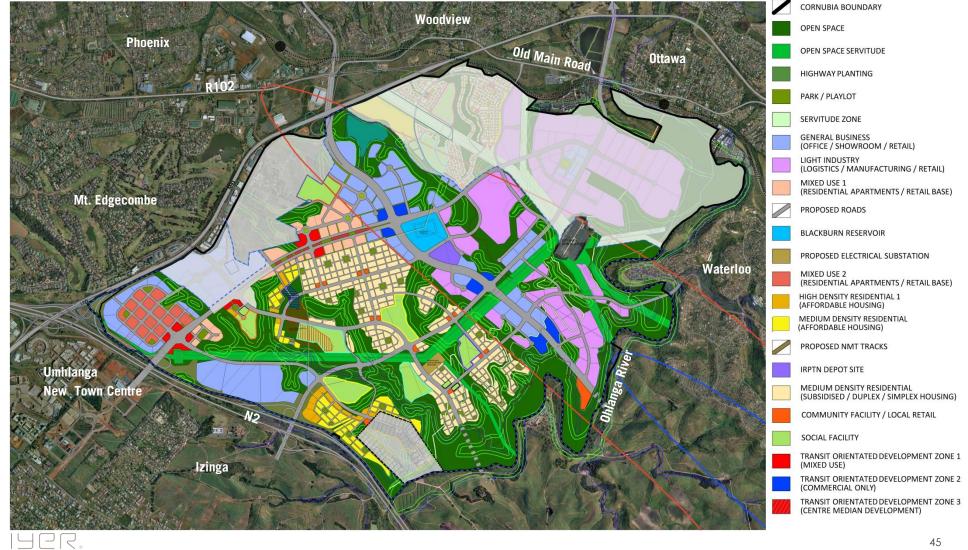
As Cornubia's ultimate vision is to create an Integrated Human Settlement, this has been reinforced by creating economic opportunity by proposing General Business and Mixed uses along interfaces of high exposure, such as the M41 and N2 and Industrial and Business within the 2035 55db noise contour. This enables the creation of a live, work and play environment.

Residential is in the form of High, Medium Density and affordable housing occupies the majority of the Phase 2 layout. The separation of the affordable housing from the subsidised units was considered an important locating factor to prevent rental boycotts resulting from the proximity of rental housing to fully subsidised housing, in other words, housing at no cost.

03 CORNUBIA PHASE 11- LUM PRECINCT PLAN

The release of phases of land for development in Phase 2 will be in accordance with an infrastructure programme and feasibility model. Each phase or phases will involve more detailed planning, design, specialist input as well as statutory approval through the relevant departments within the Ethekwini Municipality.

3.8 LUM Precinct Plan Summary



The following are 3 dimensional images of Phase 2, superblock layout overlaid over an aerial photography using Google Earth software.

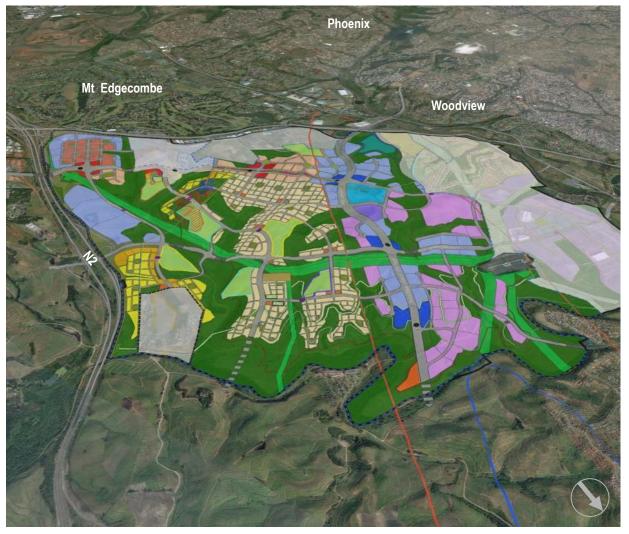
4.1 Image 1- View South to North over site

The following illustrates a view showing the surrounding context in relation with the Cornubia Development, in particular the General Business Uses along the N2 and M41 has been located along these routes for achieving maximum exposure.



4.2 Image 2- View from North to South

This view provides a birds eye view of the study area in context of greater Durban. In the backdrop the Kwamashu and Phoenix areas are clearly visible and the scale of the Cornubia development is clearly evident from this image.



4.3 Image 3- South West to North East

This view shows the proposed development along M41 which becomes the R102. The areas in white overlay are Phase 1, which are currently under construction. The image also reflects the undulating topography of the Study area, but also the proximity of the development to the coast and surrounding neighbourhoods but also the connections to these areas as well.



View 2 View 3+4

The following images are a series of artist impressions of the development along Cornubia Boulevard. These graphically illustrate the ultimate vision for the Cornubia Development.



View 1- Mt. Edgecombe interchange looking towards the Cornubia Town Centre $|\square \square \square R$.



View 2- Cornubia Boulevard showing development in the central median.



View 3- Cornubia Boulevard showing the IRPTN route with park spaces within the central median.





View 4- Cornubia Boulevard showing pedestrian and retail activities within the central median.



View 5- The intersection of Cornubia Boulevard and Dube East, showing the positioning of the BRT stations in relation to the shopping centre and T.O.D zone.

05 CONCLUSION

The report has documented the LUM Precinct Plan layout for Phase 2. This process has provided more guidance on the future development of Cornubia, in particular Phase 2.

The Phase 2 layout provides for the establishment of an Integrated Human Settlement based on the principles and objectives espoused in the framework plan. The layout sets out clearly a structure for development which maximises choice, urban amenity and lays a foundation for a sustainable future for Cornubia. The interactive process undertaken as part of preparing the precinct layout has contributed positively in shaping the plan. New bold ideas have emanated from the interactions between the professional team and the various line departments, such as the higher intensity /density TOD zone within Cornubia. The additions are as follows;

- Including TOD sites at key intersections where BRT stations are located as well as the introduction of potential stations along complimentary routes for Quality buses;
- Inclusion of a NMT strategy on the plan;
- Allocating Sites for Community/Local Retail;
- Changing Land use to Desired Activity Patterns where the zoning will permit a variety of land uses. In this way, the plan can adapt and change with ongoing trends;
- Identifying new areas for Social/Gap Housing to avoid conflict with the subsidised units; and
- Not being prescriptive and allowing for a horizontal mix of uses.

The Cornubia project has already started delivering on its objectives of providing for integrated housing with the construction of the first 482 units in the pilot phase, and some 2200 units in Phase 1b where construction has already started. There is currently a local community establishing at Cornubia.

Employment and economic opportunity is being developed in tandem with the housing, CIBE is currently being developed and an EIA process for a retail park has been approved where a new retail centre is planned to be operational by 2016. The objective of an integrated human settlement is starting to materialise.

Phase 2 will add further housing and economic opportunity once approved and therefore plays a significant role in ensuring the development impetus continues within Cornubia once Phase 1 has been fully developed.

We believe that this process of establishing a more refined plan for Phase 2 is an important step forward to realising the bold vision that Cornubia represents at a National, Provincial and Local level.



Anton Aiello, Susanna Godehart, 2010. <u>The space standards for the social</u> <u>facilities in eThekwini in the optimised locations for an Investment</u> <u>Program for Social Facilities in eThekwini</u>

lyer Urban Design Studio, 2011. <u>Cornubia Framework and Phase 1 Design</u> report

J. McCarthy.,2009. <u>Socio- Economic Impacts of the Cornubia</u> <u>Development- Specialist Report</u>

K. Breetzke.,2009. eThekwini Study on Social Facilities

Planning Initiative Team, 2008. <u>Guidelines for the Planning of Facilities in</u> <u>KwaZulu-Natal, Volume 84,</u> Critters Design Studio.

7.1 Background Phase 2- Facilities

In order to ensure that a compact urban environment is created and given the need to pursue higher densities, it is imperative that the traditional space planning standards are reviewed, therefore in determining the social facility standards for Phase 2, the similar approach adopted in developing the Cornubia Framework was followed. The clusters identified in the approved framework have not primarily changed however their locations and site configurations have been modified due to the scale of planning in Phase 2.

To recap, as per the Cornubia Framework Study, The CSIR study was utilised as it incorporated elements of the eThekwini Planning Study under the direction of Mr. Ken Breetzke and assisted by Anton Aiello. The CSIR Space Planner had a " wish list " of recommended social facilities that needed to be provided. These uses were ordered into a table of compatibility which further reduced the land requirement per use. Once this was evaluated, a screening process was undertaken to determine the possible sharing of facilities. These clusters were then represented spatially on the framework plan and facilities were located approximately within a 5 minute walking distance from each other.

The plan on the right indicates the various social facility clusters for Phase 2. These clusters have been located at key intersections and prominent positions within the layout so that there is adequate coverage to all residential areas. Some of the uses that are contained within each cluster vary and will be described in detail later on in this section. The location of the facilities are based on the concept of walkability aimed at distributing schools and other facilities within a 5 minute walk.

Table A on the following page illustrates the type and number of facilities that have been accommodated within

7.1 Background Phase 2- Facilities



7.1 Background Phase 2- Facilities

Phase 2. A design population of 103 000 people was used. This population estimate is for the entire Cornubia development i.e. Phase 1 and Phase 2. This is an additional 4000 people that was identified in the approved Framework Plan. Based on this estimation, certain facilities have been provided, some which occur in clusters whilst some are standalone facilities. The rational for the exclusions of uses have been provided. Land Uses such as a Regional Hospital , Sports Stadia are not required as there was not sufficient threshold to support such facilities. Ethekwini Health indicated during the engagement process, that there might be adequate supply of Regional Hospitals in the north and therefore a Regional Facility will not be required. A suitable location for a Sports Stadium will be determined at a regional level. One hectare has been allowed within the Mixed uses to accommodate a Tertiary Training facility as well as a Children's home, as and when the need arises.

Land uses such as a Government office, Fire station, Community Health Center have been accommodated within Cornubia. In the case of the Community Health Centre's, two standalone sites have been proposed. These have been located along Dube East which serves as a major residential spine within the development. Two Police Station sites have been proposed, one in Phase 1, off Cornubia Boulevard and the other within Phase2 along Dube East. Both these stations have been positioned in close proximity to the residential areas and along main routes to ensure they are highly accessible and visible to the community. During the development of the Cornubia Framework, it was indicated that there was a severe shortage of swimming pools in the north. Two swimming pools have been proposed within separate clusters. These will be used by the schools as well as the public after hours. A suitable site for a cemetery must be found within the northern corridor subject to detailed Geotechnical and environmental studies required to determine its feasibility.

1.5ha has been allocated for an Old Age Home within the High Density residential as and when the demand arises. 3 Local libraries, 4 Primary health Care Centres and 4 Community Halls have been proposed. These occur within individual clusters. Whilst these facilities are located in clusters they are designed in a manner to resemble as if though they are standalone facilities in respect to their building placement so facilities such as a Community Hall, Library and Primary Health Care facility which are public installations can accommodate the public user requirements for privacy, parking etc. but for instance the school facility would be able to use the library and community hall as and when required. A total of 7 High schools and 18 Primary Schools have been proposed. There is a shortfall of one school for both the primary and high school. The shortfall can be reconciled through the design of each school by increasing the number of classrooms or the size of the buildings to accommodate more pupils. This can be resolved in detail design of the school facility. A Pre school can be accommodated within the Primary school footprint.

It has become common practice that Crèche's have been developed by the private sector so no sites have been allocated for this use however crèche's may be permitted within the residential zones via a special consent process and an approval will be subject to the Ethekwini municipality. Sports fields have been catered for within each cluster. Each Secondary School and Primary school has 2 sports fields each. Parks have been provided for within the Medium Density residential areas by creating centrally located, "courtyards" which can be used as play spaces. Other larger parks have been created through design and these are reflected on the layout plan.

The table also reflects a fractional size of site based on a shortfall or surplus of a particularly facility so a negative area represents an oversubscription of that particular use where as a positive reflects a shortfall which is quantified as an area. These figures can then be fed into a larger process within EThekwini to determine the oversupply as well shortfalls of social facilities and the areas required in the north.

7.1 Background Phase 2- Facilities

Cornubia Phase 2 + 1]					
Design Population							
Estimated Households	25,695						
Household Size (Assumed)	4						
Projected Population	102,780						
Assumed Design Population	103,000						
		-					
TYPE OF FACILITY	POPULATION TRESHOLD	APPROXIMATE Minimum Size of site (sqm)	NO. OF FACILITIES REQUIRED AS PER ETHEKWINI STANDARDS FOR SOCIAL FACILITIES	PROPOSED IN Framework plan	SHORTFALL IN NO. OF FACILITIES	FRACTIONAL SIZE OF Site based on Shortfall / Surplus (sqm)	PROPOSAL FOR DEALING WITH SHORTFALL
Hospital L1 (District)	450,000	35,000	0.2		0.2	8,011	Not required due to population threshold being well below the target threshold.
Sports Stadium (regional)	200,000	30,000	0.5		0.5	15,450	Further discussions would need to take place in regard to the location of this facility in the Northern Corridor.
Tertiary Training not University	100.000	10.000	1.0	1.0	0.0	300	1Ha has been set aside in the Mixed Use 2 landuse (Town Centre) and bulk and residential yield has been adjusted accordingly.
Government Offices / Civic Centre	100,000	5.000	1.0	1.0	0.0	150	doording.y.
	100,000	0,000	1.0	1.0	0.0	100	A 1.2Ha site has been proposed in Verulam to serve the surrounding areas, however a site has been provided in
Fire Station (Suburban)	100,000	5,000	1.0	1.0	0.0	150	Cornubia for a suburban station.
Community Health Centre	60,000	15,000	1.7	2.0	-0.3	-4,250	
Children's Home	60,000	10,000	1.7	1.0	0.7	7,167	1 Ha will be set aside in medium-density residential area for a children's' home as & when demand arises. This will be a free entry use. Residential yield has been adjusted accordingly
Police Station	60,000	5,000	1.7	2.0	-0.3	-1,417	
Swimming Pool	60,000	1,800	1.7	2.0	-0.3	-510	
Cemetery (regional) (medium)	50,000	90.000	2.1		2.1	185,400	A cemetery site will have to be identified in the Northern Corridor to fulfil the immediate and future demands for this
Old Age Home	50,000	15,000	2.1	1.0	1.1	15,400	use. 1. 1.5 Ha will be allocated for Old Age Homes within high-density residential corridor as & when demand arises. This will be a free entry use. Residential yield has been adjusted accordingly.
Local Library	40.000	1.000	2.6	3.0	-0.4	-425	
Primary Health Clinic	30.000	5.000	3.4	4.0	-0.6	-2.833	
Community Hall	30.000	5.000	3.4	4.0	-0.6	-2.833	
Secondary School with shared sports fields	12,500	30,000	8.2	7.0	1.2	37,200	Increase the population of schools to accommodate shortfall of facilities. Increase from 1000 pupils to a maximum of 1400 pupils.
Primary School with shared sports fields	5,500	20,000	18.7	18.0	0.7	14,545	Increase the population of schools to accommodate shortfall of facilities. Increase from 960 pupils to a maximum of 1280 pupils.
Crèche / Early Childhood Centre	3,000	500	34.3		34.3	17,167	A Special Consent application will be required to operate a crèche subject to applicable health and safety regulations.
Sports Fields	1,000	5,500	103.0		103.0	566,500	Each Secondary School has 2 sports fields, and 2 sports fields are shared by 2 Primary Schools.
Park Space	1,000	5,000	103.0		103.0	515,000	The medium-density residential blocks are designed to create centrally located "courtyards" which can be used as play spaces with play equipment

TABLE A: SOCIAL FACILITY TABLE FOR CORNUBIA

7.1 Background Phase 2- Facilities

Table B on the right indicates the various cluster combinations created for **Phase 2**. In total 7 clusters have been proposed with 2 duplicated. There are also 2 standalone facilities for a Community Health Centre and a Police Station. A conceptual design for the Social Facility cluster occurs on the next page. These explore the clusters in greater detail which vary in size due to the site conditions.

	SHARED CLUSTERS OF SOCIAL FACILITIES	NO. OF Clusters	*POSSIBLE AREA Required per Cluster (HA)		
C	Community Hall + Clinic + 2 Primary Schools + 1 Secondary School + 4 Sports Fields + Government Offices + Library	1	6.8 ha		
L U	2 Primary Schools + 1 Secondary School + 4 Sports Fields	2	7.6 ha — 5.4 ha		
S T E R S	2 Primary Schools + 1 Secondary School + 4 Sports Fields + Community Hall	2	6.0ha — 5.8 ha		
	2 Primary Schools + 2 Sports Fields + Library + Clinic + Swimming Pool	1	4.2 ha		
	2 Primary Schools + 2 Sports Field + Library + Clinic	1	3.0 ha		
	Community Health & ARV — Stand Alone	2	0.33 ha — 0.54ha		
	Police Station – Stand Alone	1	0.37 ha		

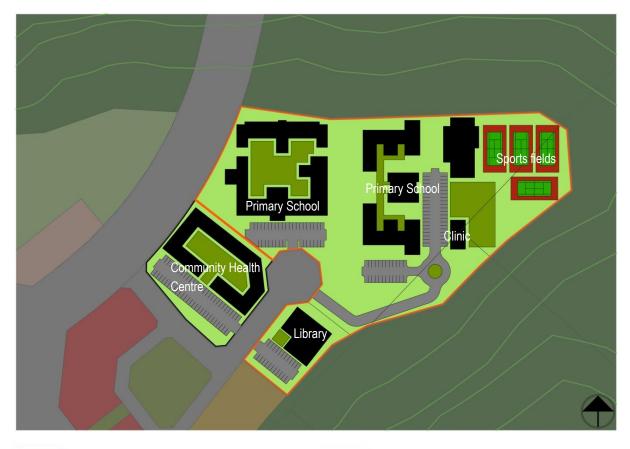
TABLE B: INDICATES SHARED AND CLUSTERED SOCIAL FACILITIES FOR PHASE 2 ONLY

(* POSSIBLE AREA REQUIRED PER CLUSTER (HA)- DEPENDANT ON SITE CONDITIONS AND EACH CLUSTER AREA MAY VARY IN DETAIL DESIGN- AREAS INDICATED ABOVE ARE BASED ON CONCEPTUAL DESIGN. SEE FOLLOWING PAGE FOR SOCIAL FACILITY EXPLORATIONS.)

Social Facility Conceptual Cluster Design



Social Facility: 4.2Ha Community health centre: 0.37Ha



2 PRIMARY S. + 2 SPORTSFIELDS + LIBRARY + CLINIC



COMMUNITY HEALTH CENTRE

Social Facility Conceptual Cluster Design



Social Facility: 7.6Ha



2 PRIMARY S. + 1 SECONDARY S. + 4 SPORTSFIELDS

Social Facility Conceptual Cluster Design



Social Facility: 6.0Ha

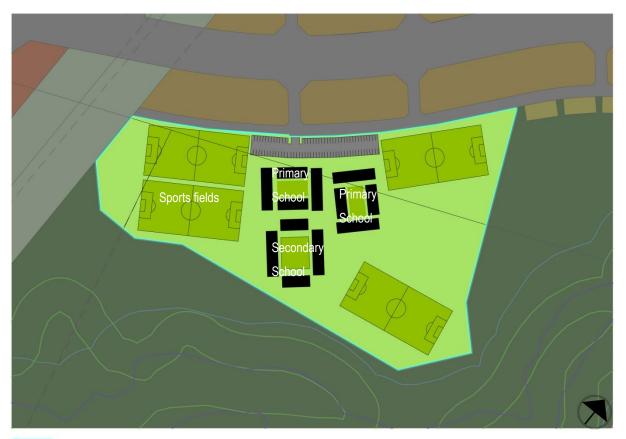


2 PRIMARY S. + 1 SECONDARY S. + 4 SPORTSFIELDS + COMM. HALL

Social Facility Conceptual Cluster Design

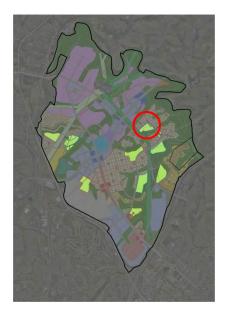


Social Facility: 5.4Ha



2 PRIMARY S. + 1 SECONDARY S. + 4 SPORTSFIELDS

Social Facility Conceptual Cluster Design



Social Facility: 4.2Ha



2 PRIMARY S. + 2 SPORTSFIELDS + LIBRARY + CLINIC + SWIMMING POOL

Social Facility Conceptual Cluster Design



Social Facility: 5.8Ha



2 PRIMARY S. + 1 SECONDARY S. + 4 SPORTSFIELDS + COMM. HALL

Social Facility Conceptual Cluster Design



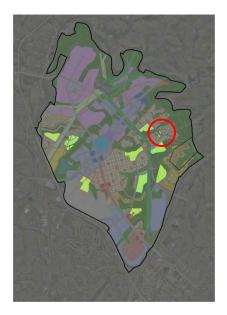
Social Facility: 6.8Ha





COMM. HALL + CLINIC + 2 PRIMARY S. + 1 SECONDARY S. + 4 SPORTSFIELD + GOVERNMENT OFFICES + LIBRARY

Social Facility Conceptual Cluster Design



Community Health Centre: 0.33Ha Police Station: 0.37Ha



07 ANNEXURE B- HOUSING TYPOLOGY EXPLORATION

<u>PLEASE NOTE</u>: THIS STUDY WAS UNDERTAKEN TO TEST THE VARIOUS DENSITIES AND COMBINATIONS OF HOUSING TYPES AND THEREFORE THE OVERALL FIGURES /DRAWINGS INDICATED IN THIS SECTION ARE SUBJECT TO CHANGE AND WERE USED AS A GUIDELINE IN THE ESTABLISHMENT OF THE LUM PRECINCT PLAN LAYOUT IN SECTION 3 OF THE MAIN REPORT. THE LAYOUT INDICATED IN THIS ANNEXURE HAS BEEN SUPERCEEDED FOR PHASE 2 – SEE SECTION 3 OF THE MAIN REPORT.



- 1.Implications of High Density Housing for Cornubia
- 2. Urban Design & Housing
- 3. Precedent Study
- 4. Cornubia Framework plan & Draft Block layout
- 5. Block Typologies Exploration of Subsidy Housing
- 6. Unit Typologies
- 7. Overall Land use & Bulk Distribution Table

01 IMPLICATIONS OF HIGH DENSITY FOR CORNUBIA PHASE 2

PROS

1. High density housing creates higher thresholds for other amenities such as shops, libraries, clinics etc.

2. The cost of servicing is reduced.

3. Higher residential densities are supportive of a sustainable public transport network.

4. High densities supported by a public transport network reduces the reliance on private transport.

5. Less reliance on private transport reduces the need to provide on-site parking which reduces the extent of roads.

6. High densities need not be high rise if parking provision is reduced.

7. The reduction in the use of private transport reduces the number of vehicles on the road which reduces carbon emissions.

8. Maximum utilisation of well located land.

CONS

 Higher densities are more costly when buildings are higher than 4 storey's as they require a lift and fire escape stairs.

2. 4 storey buildings may require piles if the ground conditions are not suitable which adds substantially to the cost per m2.

3. Difficult to extend units.

4. The financial constraints within the subsidy market means that higher densities are easier to achieve for the Social and GAP Housing market

02 URBAN DESIGN AND HOUSING

"Housing is what creates the very fabric of the city. It is what is all around us; it forms the boundaries of public space. We can say, therefore, that when we design cities... housing schemes should never begin as housing schemes but as urban designs. Designs for housing should be driven in the first instance by an idea about the city. We should design streets and public spaces first – domestic layouts should follow "

Peter Barber































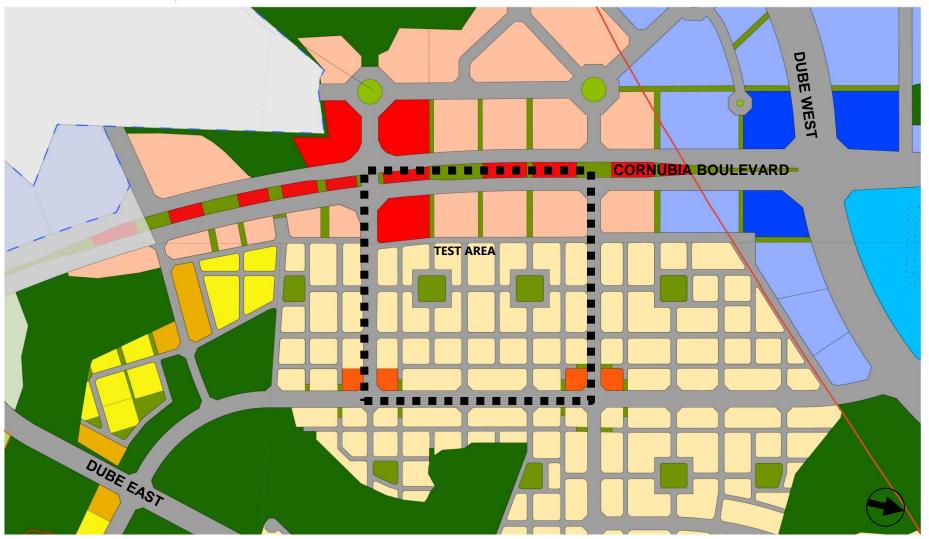


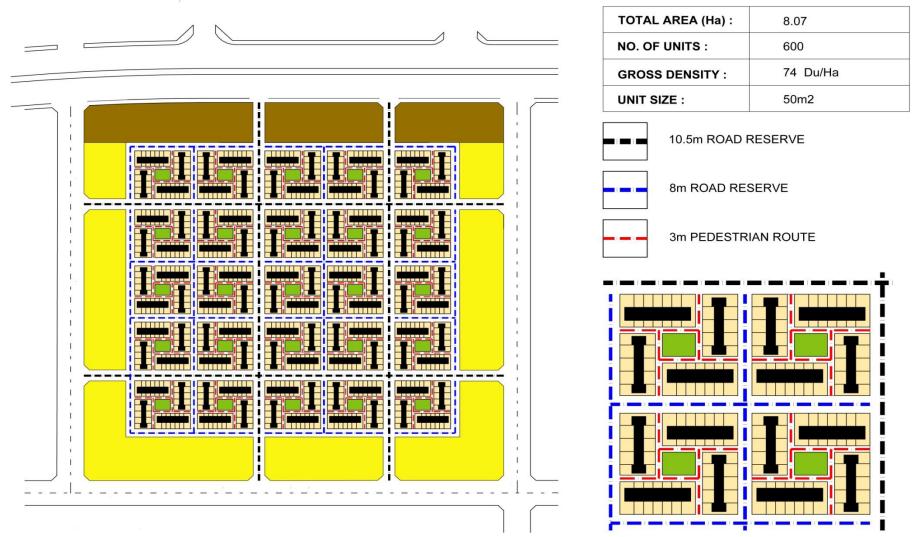
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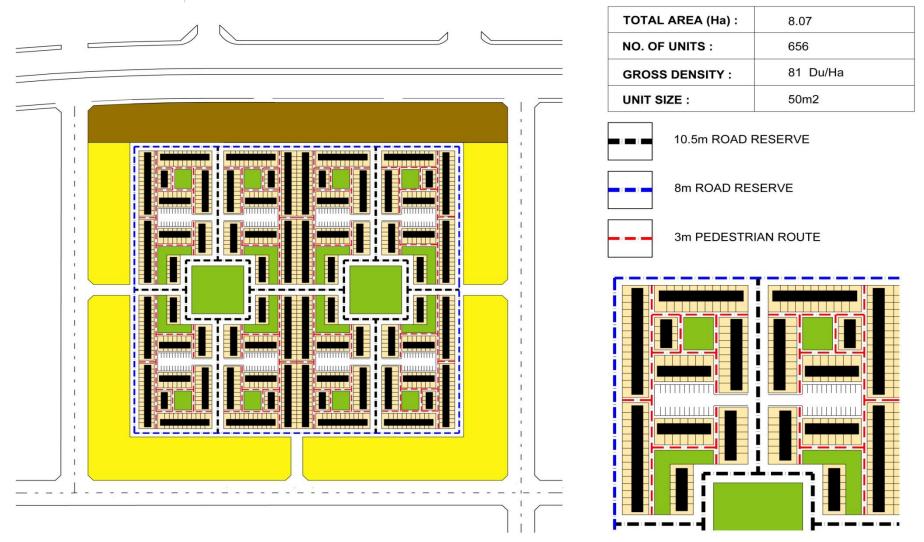


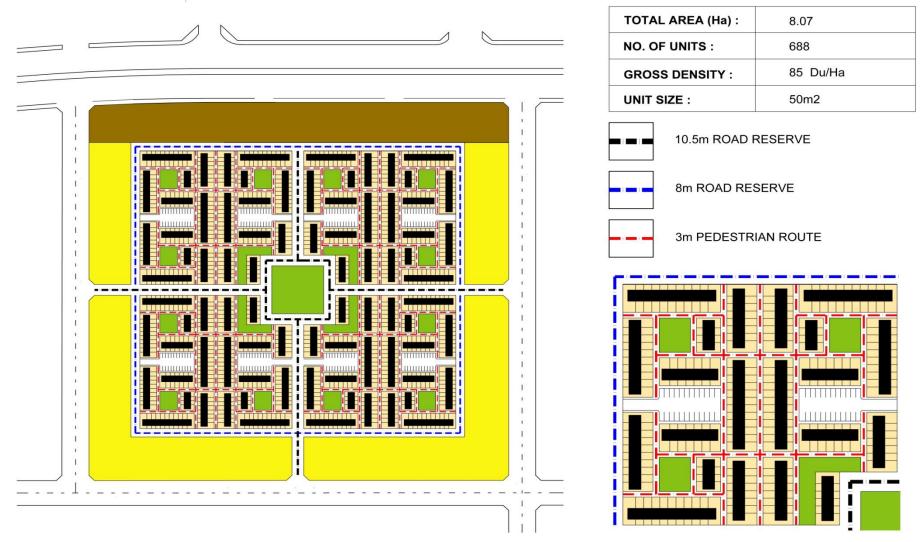


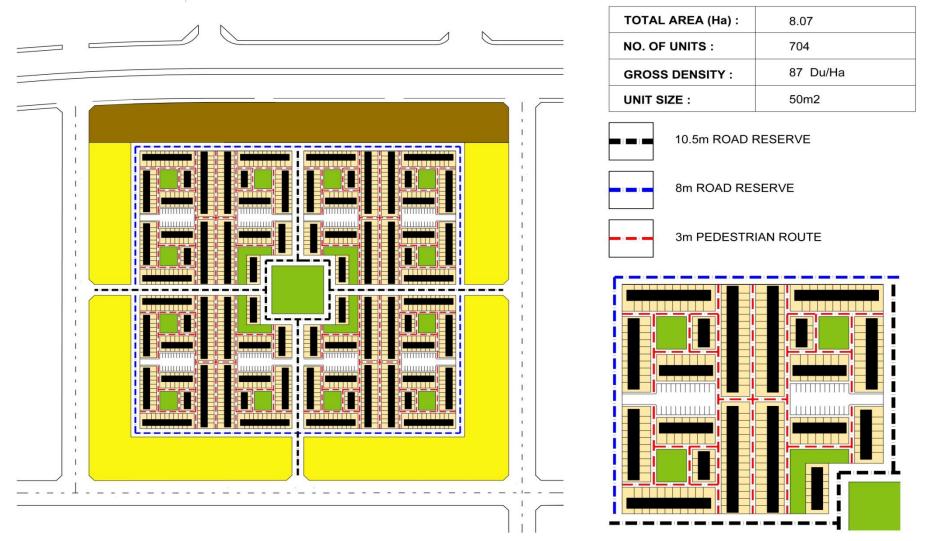
04 BLOCK TYPOLOGY- EXPLORATION OF SUBSIDY HOUSING- TEST AREA

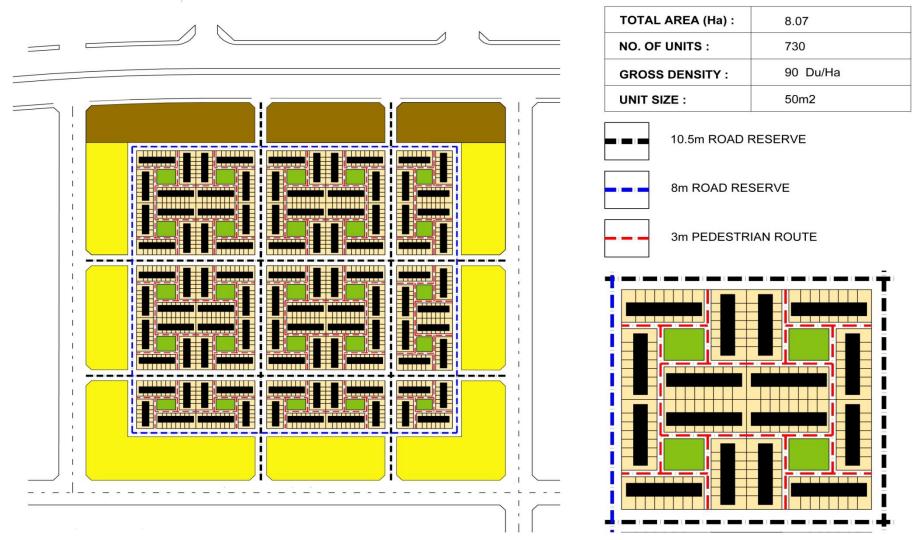


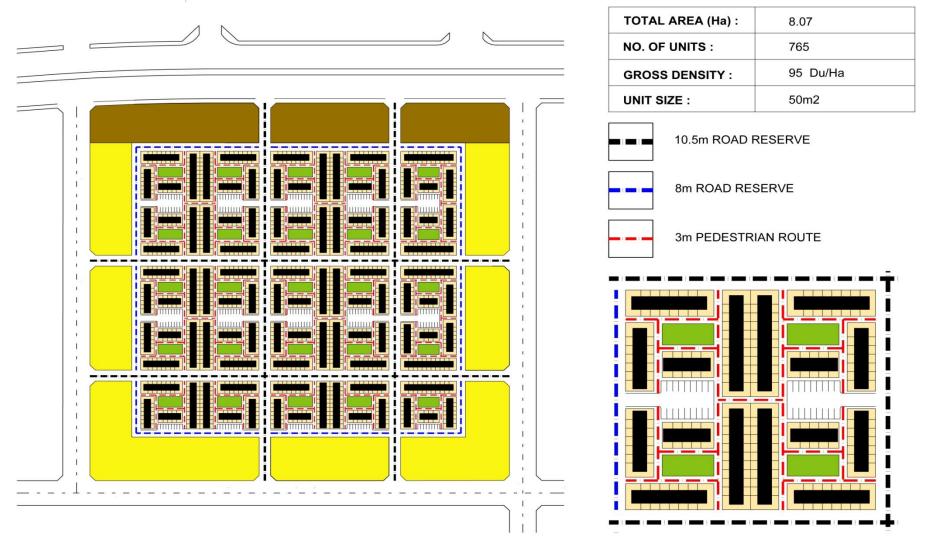




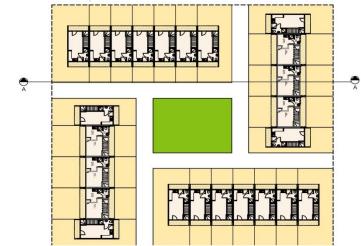


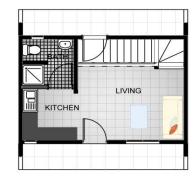






05 UNIT TYPOLOGY- MEDIUM DENSITY HOUSING INTERFACE ZONE- SUBSIDY







CITE DUAN

TYPICAL ON UNIT CROUND FLOOR UNIT

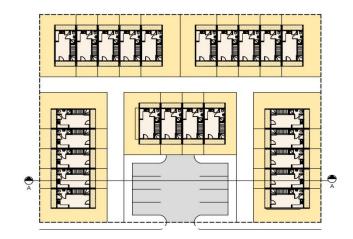
TYPICAL ON UNIT FIRST FLOOR UNIT



SITE AREA	3200 m ²				
No. OF UNITS	24				
DENSITY	74 du/Ha				
UNIT SIZE	50 m² (2 Bdrm.)				

SECTION A-A

05 UNIT TYPOLOGY- MEDIUM DENSITY HOUSING INTERFACE ZONE- SUBSIDY







SITE PLAN

TYPICAL 4M UNIT GROUND FLOOR PLAN

TYPICAL 4M UNIT FIRST FLOOR PLAN



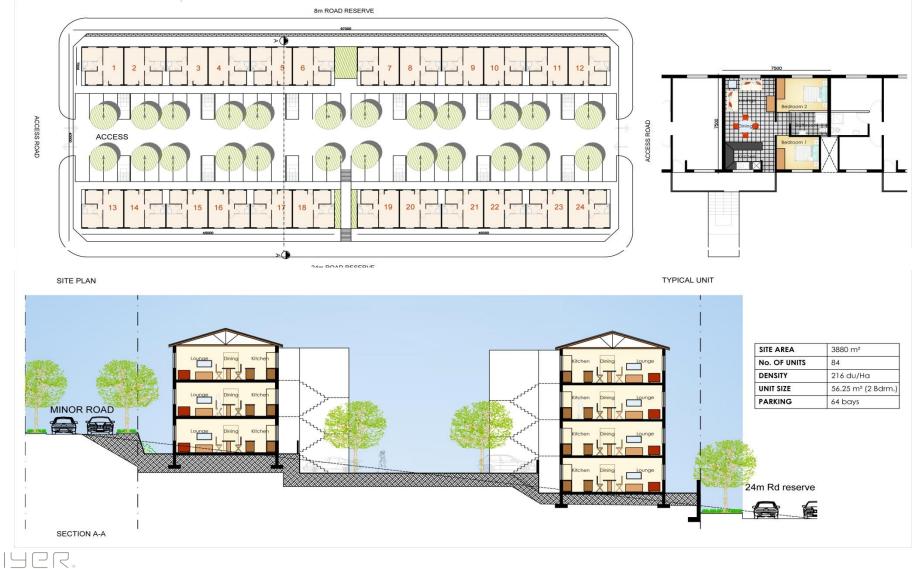
UNIT TYPOLOGY- MIXED USE 1 (80/20 SPLIT)



05 UNIT TYPOLOGY- MIXED USE 1 (80/20 SPLIT)



UNIT TYPOLOGY- HIGH DENSITY RESIDENTIAL SOCIAL/GAP HOUSING

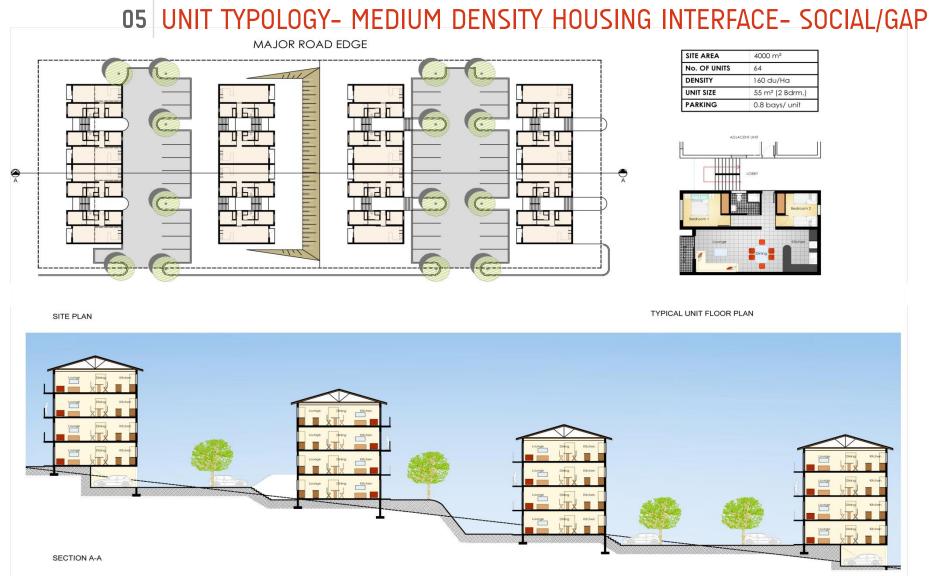


UNIT TYPOLOGY- HIGH DENSITY RESIDENTIAL SOCIAL/GAP HOUSING

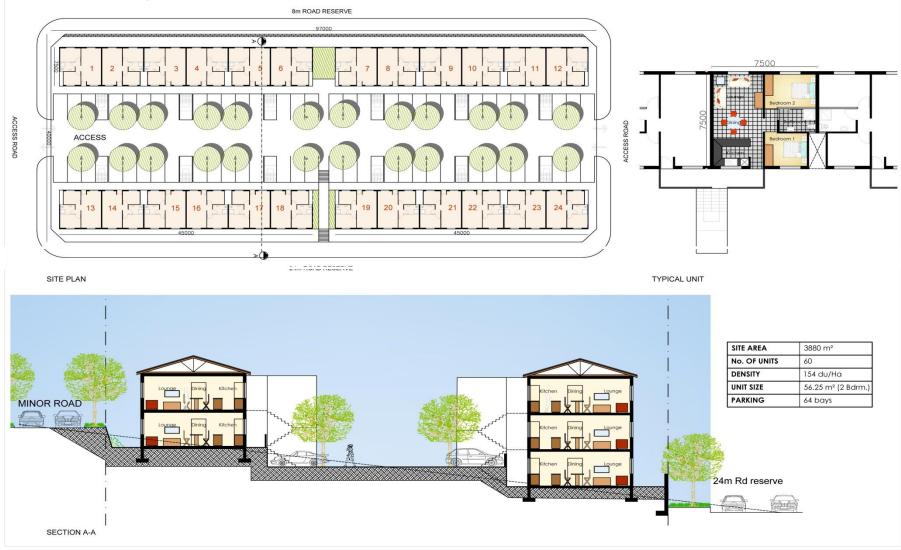


UNIT TYPOLOGY- HIGH DENSITY RESIDENTIAL SOCIAL/GAP HOUSING





05 UNIT TYPOLOGY- MEDIUM DENSITY HOUSING INTERFACE- SOCIAL/GAP



05 UNIT TYPOLOGY- MEDIUM DENSITY HOUSING INTERFACE- SOCIAL/GAP



SECTION A-A

06 OVERALL LAND USE AND BULK DISTRIBUTION TABLE

Landuse	sqm	Ha	proposed f.a.r	total bulk (sqm)	Residential bulk (sqm)	Residential density	Yield - no. Of units	%	Average unit size (sqm)
Mixed use 1 (80/20 Split) - along boulevard	285 544.80	28.55	1.5	428 317.20	342 653.76	220	6 282	23	55
Mixed use 2 (80/20 Slpit) - town centre	218 202.45	21.82	1.6	349 123.92	279 299.14	180	3 928	14	72
High Density Residential - along residential spine	121 509.97	12.15	1.0	121 509.97	121 509.97	182	2 211	8	55
Medium density - Interface zone - Social/GAP	304 963.36	30.50	0.9	274 467.02	274 467.02	160	4 879	18	55
Medium density - Interface zone 2 - Subsidy	35 142.47	3.51	0.6	21 085.48	21 085.48	120	422	2	50
Medium Density Residential - Subsidy	864 723.99	86.47	0.45	389 125.80	389 125.80	85	7 350	26	50
Phase 1 A & B							2 672	10	
Total	930 220.58	93.02		1 173 418.11	1 017 929.89		27 744	100	

PLEASE NOTE : THIS STUDY WAS UNDERTAKEN TO TEST THE VARIOUS DENSITIES AND COMBINATIONS OF HOUSING TYPES AND THEREFORE THE OVERALL FIGURES INDICATED IN THE ABOVE TABLE ARE INDICATIVE AND HAS BEEN SUPERCEEDED BY THE LUM PRECINCT PLAN LAYOUT FOR PHASE 2 INDICATED IN THE MAIN SECTIONS OF THIS REPORT.