



Draft document: for discussion purposes

Oranjemund Structure Plan 2015 -2030 – Analysis and Proposals Volume 1

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FOREWORD

To be completed

ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

To be completed

ACRONYMS AND ABBREVIATIONS

To be completed

SECTION II – URBAN STRUCTURE PLAN

CHAPTER 1 - INTRODUCTION

The Oranjemund Town Council has decided to develop a Structure Plan for the local authority area under its jurisdiction that will assist in responsibly and sustainably guiding and managing the effects of the ever increasing pressure on the natural and man-made environment of the town. Pressure on the environment is caused by the increase in the town's population, by people's economic activities and their social interactions. Often it is difficult to make planning decisions without a long-term guidance document. The Structure Plan has the aim of guiding the planning approach adopted by Council.

PURPOSE OF THE STRUCTURE PLAN

A Structure Plan is a local strategic plan/document aimed at providing information and direction to a local authority, specifically on 5 key elements,

- namely the natural environment,
- the economy,
- the infrastructural set-up,
- the socio-economic setting and
- the urban environment.

As such, the Plan is to guide the political and administrative leaders, engineers, investors and planners with high-level development guidelines and land-delivery policies, supported by research and informed assumptions. The aim of a Structure Plan is to provide specific development guidelines as far as land-use is concerned. These are depicted as individual precinct plans, followed by general implementation guidelines. The Structure Plan should inform the Oranjemund Town Council so that an integrated and holistic future-orientated planning approach can be adopted on the sustainable use of the available resources (natural and man-made), on the allocation of land for urban expansion, as well as on maximising the development potential of Oranjemund within a regional context.

It is not the intention of the Council to impede future development or to reduce the positive economic impact that

development creates. The aim is that the envisaged development takes place in a cohesive way and to provide the basic guidelines that will ensure that future developments are sustainable by identifying potential environmental concerns or requirements well in advance. The urban environment cannot be seen in isolation from the natural and social environments as the future and stability of each component are intrinsically linked.

There are clearly a number of challenges that need to be met when developing Oranjemund in the future, but these challenges are not insurmountable and development can take place in a way that will have a positive impact on the socio economic conditions of people living both within the study area and beyond.

In order for the Plan to be successful, it should also be considered as a publicly-owned document, accessible to the public and consulted before planning decisions are made. Transparency in the planning process is of the utmost importance within a democratic society, and broad, grass-root public support is required for any plan of this nature to be successful.

The Structure Plan should also be a reference document for state-owned enterprises such as NamPower, Regional Electricity Distributors, NamWater, Roads Authority, Directorate of Civil Aviation, TransNamib, Telecom Namibia, as well as for local, regional and national education providers, and the various public and private health services when planning their own future developments in and around Oranjemund. By working together in a spirit of communication and cooperation, common goals can be achieved with the minimum of redundant work and expenditure.

The purpose of this document is not to provide for detailed environmental or engineering solutions, but to rather inform future studies so that developments can take place in a responsible and sustainable manner. It should be noted that some challenges with regard to development will require additional environmental and engineering solutions. **However, local and detailed environmental and**

engineering solutions are beyond the scope of this report.

Of significant importance to the document is the fulfilment of the requirements set by the Environmental Management Act (and the regulations in support of this Act) in terms of environmental clearance certifications and approvals that must be obtained for existing and new developments. This study acknowledges the environmental conditions found in the study area and provides some high-level input on environmental management principles. Environmental clearance certification needs to be obtained by the Town Council and by investors on a project-by-project basis.

Developers will still be required to produce Environmental Impact Assessments (EIA) and Environmental Management Plans (EMP) for each individual development initiative, but the Structure Plan will provide a framework for planning and decision-making.

For monitoring and review purposes, the Plan provides guidance to the Council when preparing annual budgets and addressing the developmental needs of Oranjemund.

When discussing 'development' in Oranjemund, planners are not just describing the physical expansion of the Town, but also the improvement of the urban fabric as it exists today, which is referred to as consolidation.

The **second part** of the Structure Plan of Oranjemund is the real heart of the structure plan. This section looks at the analysis of the town within the region, local and inter-regional context, and its environmental and man-made features. This section looks at the areas identified as "sensitive no-go areas"; areas where development can take place with certain mitigation measures put in place "tread-lightly" and then areas for development. This section also further elaborates on the various spatial planning proposals for the town, from street corridors to larger townlands scale development initiatives.

CHAPTER 2 –ANALYSIS OF MAN-MADE AND ENVIRONMENTAL FEATURES

1.1 INFORMANTS AND CONSTRAINTS

Informants and Constraints

The //Karas Region is known for its small stock sheep industry, its tourism and scenic landscapes and its mining industry. Unfortunately as //Karas is an arid region, farming is becoming more and more difficult annually. Annual population growth for the region (1.1%) is lower than the national average of 4.4%, which leads to a low population for the largest region in the country. The population density is only 0.5 people for km² and only three major towns, Oranjemund, Lüderitz and Karasburg. The low population and scattered population make it difficult for towns to develop. Even the populations of towns are low which makes their tax base small which again leads to less capital for the Council's to utilise for further development of the town. Furthermore the distance between towns in the south is also a constraint to development. All these factors contribute to the decision of an investor on whether to invest in a town or not.

Oranjemund was until very recently, a closed mining town. The town of Oranjemund was established in 1936 and has grown since that time. Perhaps one of the biggest constraints for the growth of town is the surrounding diamond licenses surrounding the town. Until these licenses have been cleared for urban development, the town cannot expand into these areas. Currently the townlands of Oranjemund is relatively small and will soon, with the new townships being developed, be fully planned. It is expected that by 2025 the majority of the usable townlands would have been planned. It therefore imperative that additional land is made available for the growth of Oranjemund by 2030. A Second constraint is the topography and geology of

the area. Further north of the townlands the rising dune belt can be found. The quality of urban development on these dune areas is questioned.

One of the unique characteristics of the town is the wildlife roaming freely in town. This is such a unique character that it is a comparative advantage for the town. To the east of town is a wildlife corridor, through which some wildlife moves to reach the river. This corridor is important for the sustained free movement of wildlife in town.

South of town is the 'pink pan', the Orange River and the Ramsar Site. These three aspects are important bird sanctuaries and tourism attractions for the town.

Further south-west towards the golf course and the mouth of the river the potential sensitive of the area increases and the utilisation of this area of large scale urban development is questioned.

The Swartkoppe hill to the east of town is an important nature reserve area that has a high abundance and diversity of succulent plant (NACOMA, nd).

East of town, towards Swartkoppe, the area of jurisdiction of townlands is rather restricted with the larger section of townlands to the south of the main road. This southern portion is however within the old floodplains of the Orange River and detailed studies will have to be done before undertaking development. This area is perhaps more suitable for agriculture developments. The area to the north of the main road is suitable for a few hundred meters until it reaches the rising dune area. This area has also not been cleared yet by Namdeb for mineral resources and until such time will not be able to be used for urban development.

The area to the west of the existing town is heavily disturbed by mining activities and extensive rehabilitation will have to be done before urban development can take place in this area. The main security gate factory is west of town and the chances of having increased human habitation close to this facility is minimal until either closed or relocated.

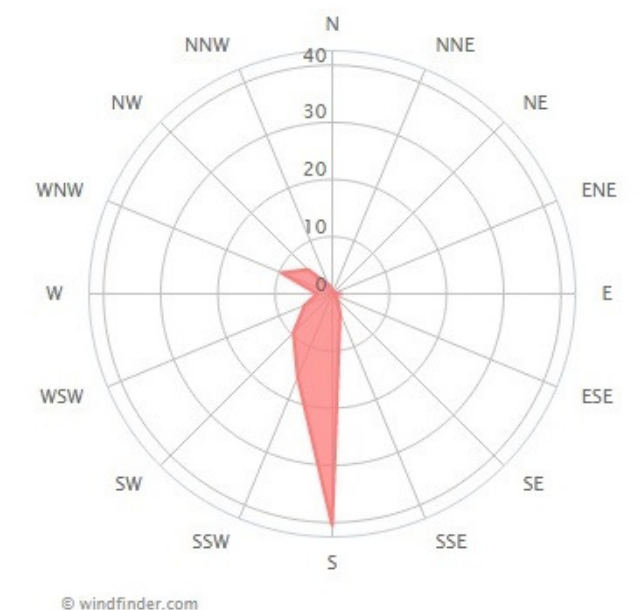
The predominant wind direction is mostly from the south. To the south-west of town, on the edge of the townlands boundary and the ocean are rows of dune hummocks. These dune hummocks are important for two reasons: stopping seawater from flooding into the mainland and the creation of protective ecological areas for small animals, plants against the elements.

Due to the somewhat limited size of the townlands and development potential the town will have to look at densification and intensification of the existing town.

The town of Oranjemund, although quite far from other Namibian service centres, is within proximity to three major tourism/ conservation attractions: Sperrgebiet National Park; the Richtersveld Transfrontier Park and the Orange River Ramsar site.

The Sperrgebiet (Tsau //Khaeb) is perhaps one of the most "secretive" national parks in Namibia and has a certain allure for visitors wishing to visit. The park, the diamonds and the opening of the town in 2017 will have a definitive impact on the town in terms of influx of people seeking work and visitors wishing to see the "secretive" town of Oranjemund

d. Wind direction distribution in (%)
Year



Source:
windfinder.
com
(Windfinder
)

Regionally and interregional the biggest constraint is the distance from other centres. With Oranjemund being the most southern town it is quite far from the capital from export facilities such as the Walvis Bay harbour and other centres. This makes the import of goods and products difficult and more expensive. The current permit requirements to enter town is also a limiting factor for visitors. Air Namibia has weekly flights to Oranjemund but these flights are often hampered by difficult misty conditions that interfere with the landing of the aircraft and many times the aircraft has to return to Windhoek.

Environmental considerations

There are a number of environmental considerations that will have to be taken into account with development in the town. A part of the following section is taken from the “*Environmental Assessment Oranjemund*” done by SAIEA for the structure plan. The separate document will be available once finalised.

North and West of townlands

Mining license 43 is an area of mining license that surrounds the townlands of Oranjemund. Any expansion outside of the current townlands will have to be undertaken with approval from the mining license holder (Namdeb). It is expected that by 2050, according to Namdeb current work plan, these areas might have been cleared.

Flood area

The likelihood of the Orange River flooding certain parts of the townlands is something that must be considered. Any development therefore, to take place south of the main road into town, will have to undertake due diligence on their own account and have engineering studies done to establish the likelihood of flooding and possible mitigation measures. The same applies for developments towards the golf club and beach area. Any developments proposed by this structure plan will have to be tested with engineering studies and will have to have measures put in place for possible flooding.

Ramsar site

The Orange River mouth is one of only a few perennial wetlands on the arid west coast of southern Africa. It has been declared a Wetland of International Importance in 1995 under the Ramsar Convention, and this status extends to both sides of the border between Namibia and South Africa, making it a transfrontier Ramsar site. The entire Sperrgebiet, including the Orange River mouth, is recognised as an Important Bird Area (Simmons 1999) and an Important Plant Area (Hofmeyer 2004).

Wetlands have been identified as a critical class of endangered/vulnerable landscapes in Namibia (Simmons, Brown & Griffin, 1991). This is because Namibia is an arid country and water resources are rare and extremely vulnerable to over-exploitation. The status of the Orange River mouth is elevated to a Wetland of International Importance, based on the fact that:

- the Orange River provides essential habitat for numerous water-dependent and water-associated mammals (Griffin & Grobler, 1991), amphibians and reptiles (Griffin & Channing, 1991) i.e. the “linear oasis” effect in an otherwise arid landscape.
- There is an appreciable assemblage of rare, vulnerable and endangered species or subspecies of plant and animal, or an appreciable number of any one or more of these species.
- it regularly supports substantial numbers of individuals from particular groups of waterfowl, indicative of wetland values, productivity and diversity.
- It regularly supports 1% of the individuals in a population of one species or subspecies of waterfowl.

Up to 25 000 birds congregate at the Orange River mouth for feeding and roosting (Williams 1986, Simmons 1996). These birds comprise about 60 species (Ramsar 1995), of which 13 are Namibian and South African Red Data birds. They make up more than 1% of the world population of

Hartlaub’s Gull, Damara Tern and Cape Cormorant. On a southern Africa scale the wetland supports more than 1% of the subcontinental population of blacknecked grebe (*Podiceps nigricollis*), lesser flamingo (*Phoenicopterus minor*), chestnut banded plover (*Charadrius pallidus*), curlew sandpiper (*Calidris ferruginea*), swift tern (*Sterna bergii*), and Caspian tern (*Hydroprogne caspia*).

Other wetland red data species present in the river mouth, but with populations below the regional 1% level are the great white pelican (*Pelecanus onocrotalus*), little bittern (*Ixobrychus minutus*), greater flamingo (*Phoenicopterus ruber*), African black duck (*Anas sparsa*), yellowbilled duck (*Anas undulata*) and the greyheaded gull (*Larus cirrocephalus*).

At least 33 mammals are known to occur at the mouth. Hippos, which once populated the area, were hunted to extinction here in the 1800s. Cape clawless otters and water mongoose occur in the river. There are incidental sightings of brown hyena at the Orange River mouth (Wiesel 2005). The wetland habitat also supports water leguaan.

Amongst the freshwater fish assemblage there are 3 species that are endemic to the lower Orange River: largemouth yellowfish, rock catfish and Namaqua barb.

Key habitats include the western portion of the salt marsh for waders, and the mouth area for terns and cormorants. Areas adjacent to the mouth form a floodplain which commonly attracts gemsbok and ostriches. The riparian vegetation lining the Orange River is critical for stabilising the banks, particularly during periods of high flow. The thin strip of trees and shrubs along the banks of the river also provide food, cover, roosting and nesting areas for birds, and shelter, food and habitat for vervet monkeys and kudu.

The present extent of the Ramsar site covers about 2,000 ha, extending about 9.5 km inland from the Atlantic shore up to the Ernest Oppenheimer Bridge.

The Orange River Mouth wetland has been adversely affected by human activities on both banks of the river and by declining river flows and fewer floods. These include the levées that have been built to protect the agricultural developments at Alexander Bay, the oxidation pond system near Alexander Bay, the road across the salt marsh to the river mouth on the South African bank, and the golf course, protected by a dyke on the Namibian bank.

The mouth of the Orange River used to close regularly during periods of low flow before the commissioning of the major dams upstream in South Africa. Water releases from these dams for irrigation and other purposes have resulted in higher low flows at the mouth during the dry periods and as a result, the mouth hardly ever closes any more. The upstream dams have also resulted in a considerable reduction of the occurrence and severity of small to medium floods at the river mouth (Huizenga, 1996).

As a result of these changes in the hydrology of the river, and infrastructure developments on both banks, there is considerable concern about the future condition of the wetland. The South African portion of the wetland is now listed on the Montreux Record as Degraded due to these changes. There are various conservation and management planning activities currently underway to restore the wetland. (SAIEA, 2015)

Low hummock vegetation

Very little of this habitat type remains in the Sperrgebiet, as most of it falls within the area that has been dug up by mining. The habitat is dominated by the low succulent shrub, *Brownanathus nollothensis*, which is a Namibian endemic. This is the main habitat for the desert rain frog (*Breviceps macrops*) and the twin-spotted adder (*Bitis schneideri*), both of which are considered to be 'flagship' species (Griffin 1993). This is also the habitat for several other reptile species with wider ranges (Griffin 1997). (SAIEA, 2015)

Swartkop Nature Reserve

Swartkop is a declared Community Nature Reserve on account of its rich flora. It harbours a fog-dependent succulent flora including several Lower Orange River endemic succulent plants such as *Cheiridopsis verrucosa*, *Euphorbia stapelioides* and *Sarcocaulon multifidum* (Williamson 1994, 1997). These slow-growing succulents are particularly sensitive to disturbance. (SAIEA, 2015)

Pink Pan

The pink pan is a well-known feature of the town and bird area and a tourism area. Developments in the surrounding area needs to take cognisance of this feature.

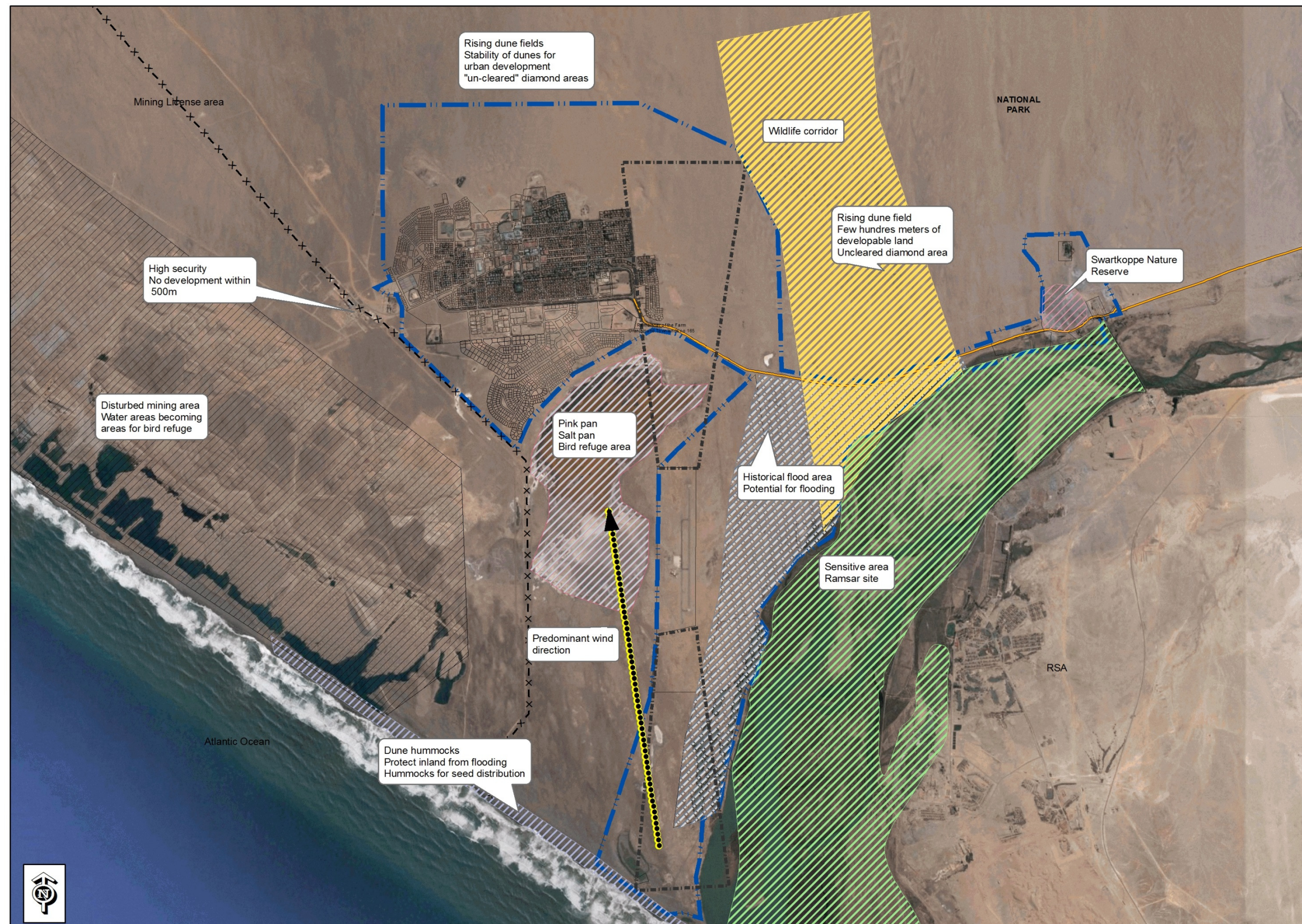
Wildlife

The sight of tame gemsbok grazing on public lawns and pavements is unique to Oranjemund, and efforts should be made to retain this feature. However, the animals are likely to come under threat if there is large-scale in-migration of work-seekers to the town in future (SAIEA, 2015). Every effort should be made to protect this unique feature by means of by-laws and strict policing. Community awareness of the benefits of these animals for the town should be done. These animals will have a certain attraction for tourist once the town opens and will therefore be an important economic feature for the town.

Existing landfill site

The existing landfill site on the northern side of town is within the areas that will be developed within the next 2 to 5 years. This landfill site therefore has to be relocated to an alternative area.

Figure 1: Constraints and influences on local and regional scale



CHAPTER 3 BROAD SPATIAL GUIDELINES FOR ORANJEMUND

- Densification of central town area
- Re-defining the CBD
- Identification of development nodes
- Expansion of urban development area
- Protection of key natural resources
- Encourage investment through the creation of choice for investors through creation of different land-use options
- Creation of business, trade and agriculture opportunities
- Continuance of open space system
- Increase in bulk, density and intensity
- Creation of town entrances
- Employment creation through encouraging the following sectors: Agriculture/Agro-processing; Manufacturing; Logistics and Hospitality and Tourism

Beautification, activity street and Town entrance

Oranjemund needs to change the image of the town, from being a town situated off-main street to a town on main street. The image of hidden away houses with a small central business area is to change towards a more interactive vibrant activity street concept.

One of the measures to be implemented is the creation of town entrances. This is to be in the form of a round-about at each of the identified entrance points.

Defining a central business area

Defining a central business ensures the allocation of higher bulk and intensity uses within such an area. The aim is to identify the central business area and then to encourage higher densities, higher bulk and higher intensity uses within such an area. This is to support the central business area and ensure sustainability of the area.

Nodal development and curbing urban sprawl

The creation of secondary smaller development nodes is to be encouraged. The objective of such nodes is to bring amenities closer to communities living further away from the central business area. However, these nodes are to focus on providing the basic amenities with shopping centres and large business and office developments located within the central business area.

Curbing urban sprawl will release pressure on the service delivery of the Council. Urban sprawl takes land-uses further away from the centre of town. This means that communities have to travel longer distances to reach the town centres and important amenities and the servicing of such areas becomes expensive due to long distances that services has to be provided. Urban sprawl is also not sustainable in terms of providing public transport. To provide public transport sustainable and make it feasible, it requires larger number of people in a smaller area.

By intensifying and densifying the existing developments within town, it also ensures that people are closer to the basic amenities. In a town such as Oranjemund densification does not mean high rise buildings of 10 or 20 storeys, it rather refers to two or three storey buildings, allowing second dwellings or allowing subdivision of large plots. For example: an area with a density of 1:600 will be encouraged to apply for densities of 1:300. Densification also does not only refer to townhouse developments, as it can also refer to permitting a second dwelling on a property or a duplex flat. Allowing for a mixture of uses such as office and residential rights on a property also increases the intensity of use of the erf.

Industrial / logistics development

Oranjemund's locality in terms of the transport corridors is a bit-off the "beaten track", but this should not discourage the town from having industrial and logistics activities. With the possibility of a harbour and opening up of the road to Lüderitz, these can bring connectivity to the forefront for the town.

Tourism development

One of the key aspects the Council should look at is addressing sustainability of the town's economy without the mining component. There will come a time that the town will have to start relaying on other economic factors to keep the town going. Therefore diversifying the economy is an important aspect for the town. Making provision for tourism development will form an integral part of this campaign. The town not only has the mining tourism to offer, but also niche tourism such as bird-watching, nature tourism, fishing, the Ramsar site, the Orange River and the Sperrgebiet. These factors combined put Oranjemund within achievable reaches of turning the town into a hot-spot for tourist. The protection of key natural resources such as the wildlife, the ramsar site, the Swartkoppe hill and dune hammocks are therefore important to put this strategy into place.

Curbing urban sprawl - Intensifying, densifying and expansion

Urban Sprawl is a general term used to describe continuous low density development without a clearly defined centre, usually encouraging car dependency and the segregation of uses..

Low density developments can be popular with some consumers, but these can still be provided within an urban expansion plan.

Urban sprawl is not seen as environmentally sustainable on account of the increased distances between activities, the dependency on cars, and the expense of providing a future public transport system.

Urban sprawl, by the nature of it being low in density, also increases service costs, as infrastructure extends over greater distances before it is able to reach areas of demand.

As a function of increased density, buildings will need to be allowed to get taller, and to cover a greater bulk, offering retail, office, institutional and residential uses. Careful consideration will need to be made when approaching foundation design and fire safety (particularly with regard to increased travel distances and surface spread of fire). But

neither of these problems is insurmountable, and taller buildings can be constructed providing building control regulations are observed.

In addition to increasing density, taller buildings have other passive advantages such as the creation of shade and enclosure that can moderate the environmental conditions at street level, by cooling through shading, and by providing a wind barrier.

Green Routes

‘Green routes’ should be maintained, to provide pedestrian walkways and cycle lanes between residential areas and create connections that can be used by residents to interconnect between one neighbourhood and the next. Oranjemund is in the fortunate position to already have such green routes, making the town one of a kind in Namibia. Institutional uses such as schools and healthcare centres should be located along these routes so that such uses can be accessed without needing to walk along busy roads. These corridors will also create an aesthetical pleasing environment, which in return can be one of the drawing cards for visitors and tourist.

Agriculture industries

Looking at the diversification of the economy of the town the Council also has to look at aspects of agriculture, more specifically irrigation or cash crop production.

CHAPTER 4 KEY CONCEPTS

These concepts will be discussed in detail in the next sections.

4.1 ROADS AND CORRIDORS

The Objective of creating streets and corridors are to:

- Promote connectivity
- Promote increased densities and intensities of land uses along certain networks
- Encourage through-traffic that will support and re-inforce the range of land use activities along the corridor

The main objective of creating activity streets and corridors is to integrate the various town developments and linking these developments by means of higher intensity activity streets.

The policy guidelines and proposals will apply:

- **Outer circular route/ urban edge** is the proposed high mobility corridor for the town. This route will be right on the urban fringe of town up to where urban development is to take place up to 2030. The road will also act as an urban edge for the town. This route will be high mobility, for heavy vehicles and if the harbour is to be developed to the west of town – an industrial relief road to the harbour.
- **Local Mobility corridor** refers to the main road into town and then continuing through town. The aim of this road is to create mobility and connecting the various extensions. This will be a wide street corridor where mobility will have priority. Bus and taxi's route. Higher intensity activities/mix-use activities will take place at certain identified intersection points.
- The local mobility corridor will enter into town by means of three gateways – east, north and west.

- The eastern gateway will be the gateway from Rosh Pinah that will connect town with the rest of the country. This gateway is to announce to visitors that they have entered town.
- The northern gateway is the enter town from the road to Lüderitz. This road is still under discussion but it is expected that in the future the road to Lüderitz will be opened for the general public.
- The third entrance gate, from the west, will be from the proposed deep port, which is under feasibility stage. Once found feasible (if feasible) the western gateway is to serve as an entrance/exist to the port area. This will also ensure easy access from the main road to the port by means of the local mobility route.
- **Activity street** refers to the main activity streets within town. Along these streets higher intensity mix-uses and business activities will be encouraged. Intensity of activities will vary (see policy map). Home office activities and bed and breakfast/ guest house activities will especially be encouraged along these routes. On this activity street priority will be higher intensity uses and pedestrian friendly routes.
- Cycling lanes, pedestrian walkways and bus lanes will form part of the activity street.
- Shop/house concept, higher densities and tourism establishments are to be encouraged along these activity streets.
- The activity streets are to be paved, landscaped and kept clean. Bus and cycling lanes are to be introduced on this spine. Speed along this spine is to be slower but still manageable for transportation activities. On-street parking, four-way stops, traffic lights are all methods to reduce the speed along the corridor.
- The main objective of the activity street is to be vibrant, interactive and permeable.
- **Secondary activity streets** refer to a lower order activity street. The idea with this street is to indicate the importance of the street and that by 2025 higher activity uses can be encouraged along these streets. Mobility will be slower, pedestrian access is to be encouraged. Home office activities and bed and breakfast/ guest

house activities will be encouraged along these routes. The idea is not to change the residential character of the area, but to still allow for higher intensity activities.

- **Secondary activity streets** refers to streets that is within neighbourhoods but where a slightly higher intensity than residential can be encouraged. These will include a corner shop - not more than one corner shop within a distance of 2km; office rights with a low bulk of 0.4; resident occupations and tourism establishments such as bed and breakfast, guest house. The aim of this "corridor" is to give a variety of uses to owners, but where the character of the area is not to be changed, in other words, the activity must be able to fit within the existing house. No shebeens or bars – the neighbourhood is still to remain quite of nature
- **Harbour road** is a proposed road from town to the harbour. At this stage the locality of the harbour has not been finalised and this road will depend on the feasibility report and its findings.
- **Scenic route** is the route from town to the golf course, beach area and activity precinct. This scenic route can be closed down during golf tournaments, for safety purposes. In the case of the road being closed down, the alternative route (Golf estate route) will be used.
- **Golf estate route** refers to the proposed route that will branch from the scenic route and will provide an alternative access point to the golf estate and the beach precinct. This will be a slow moving route.

Figure 2 Oranjemund Outer and Inner corridor

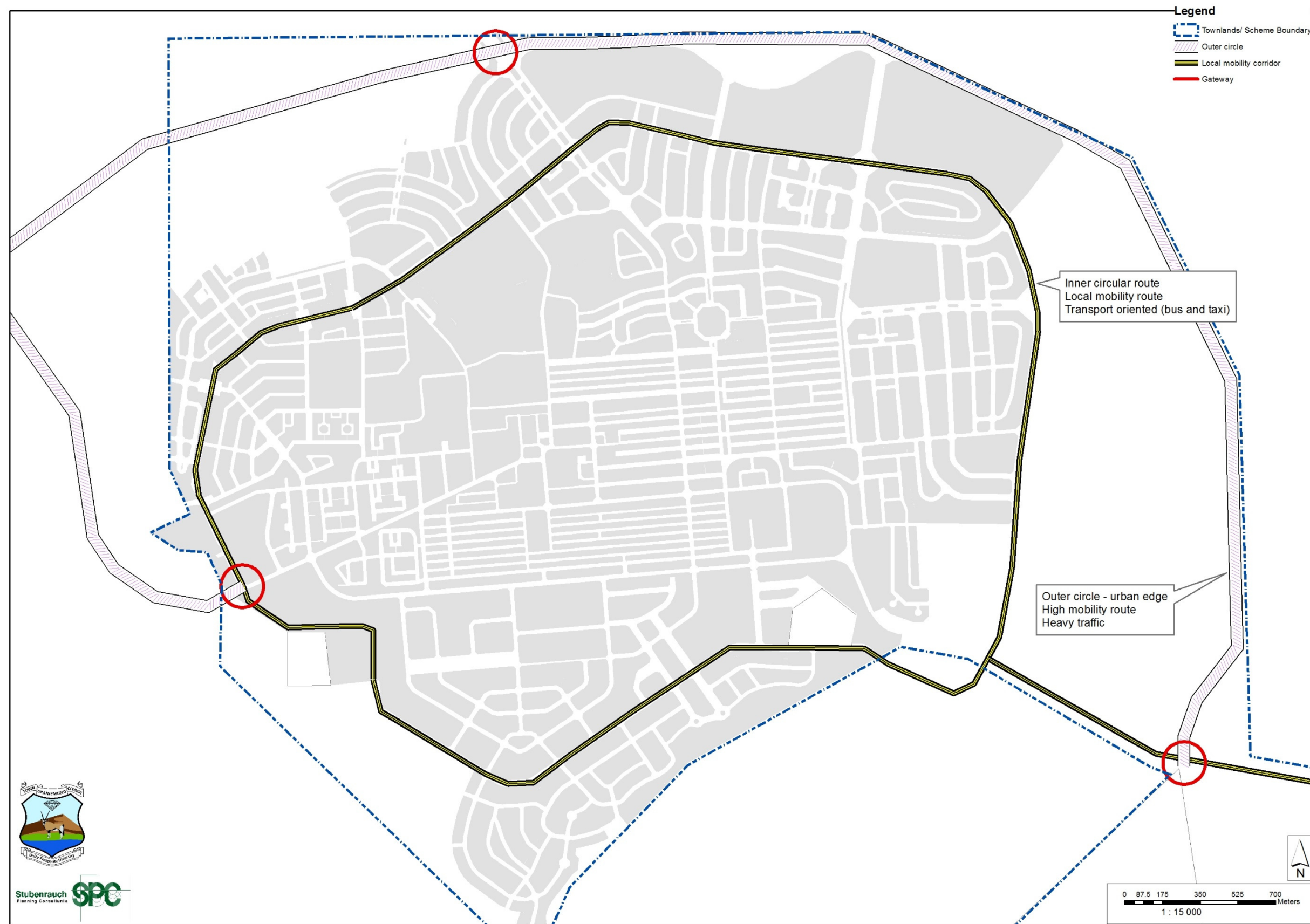


Figure 3 Activity streets

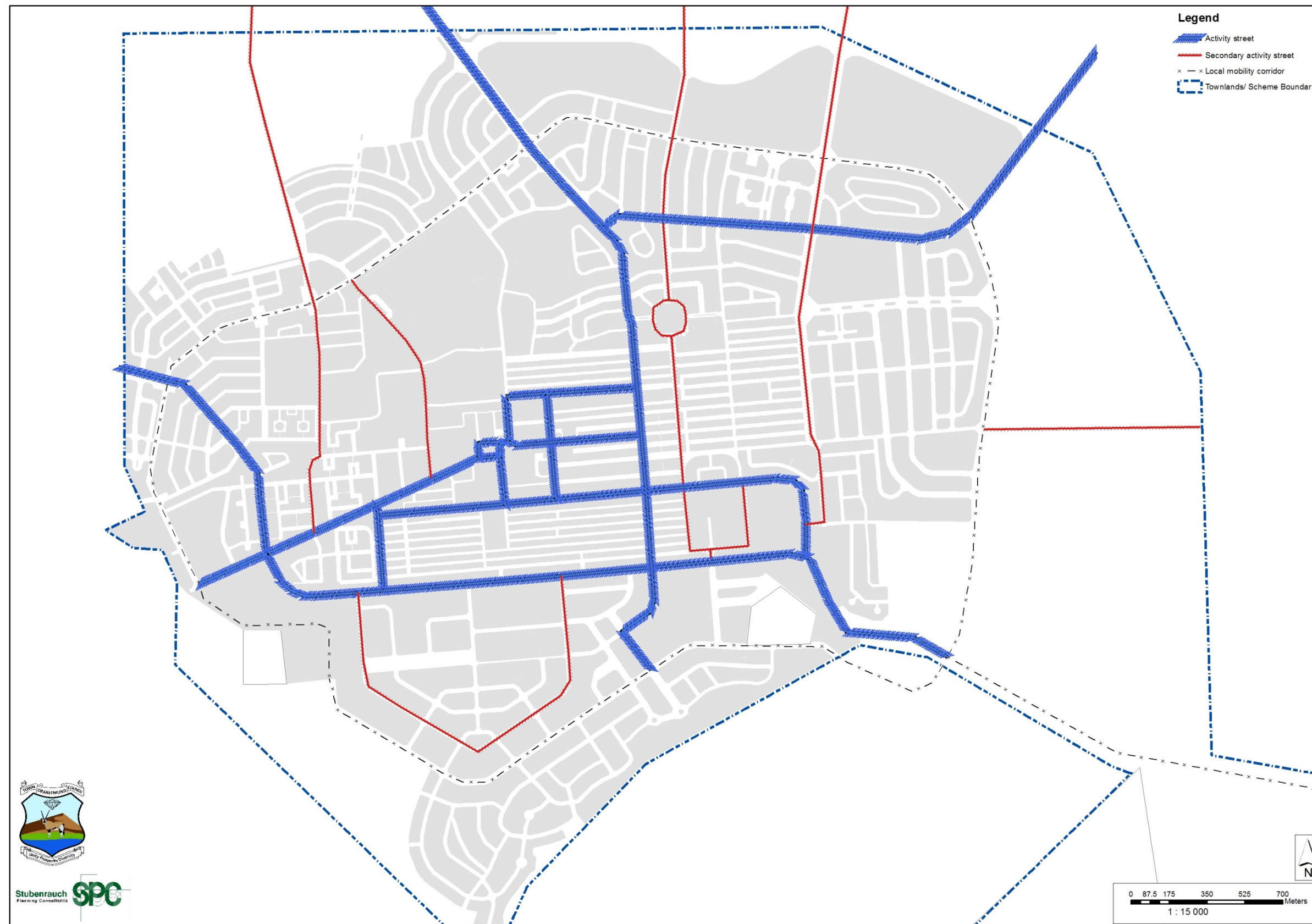


Figure 4 Corridors

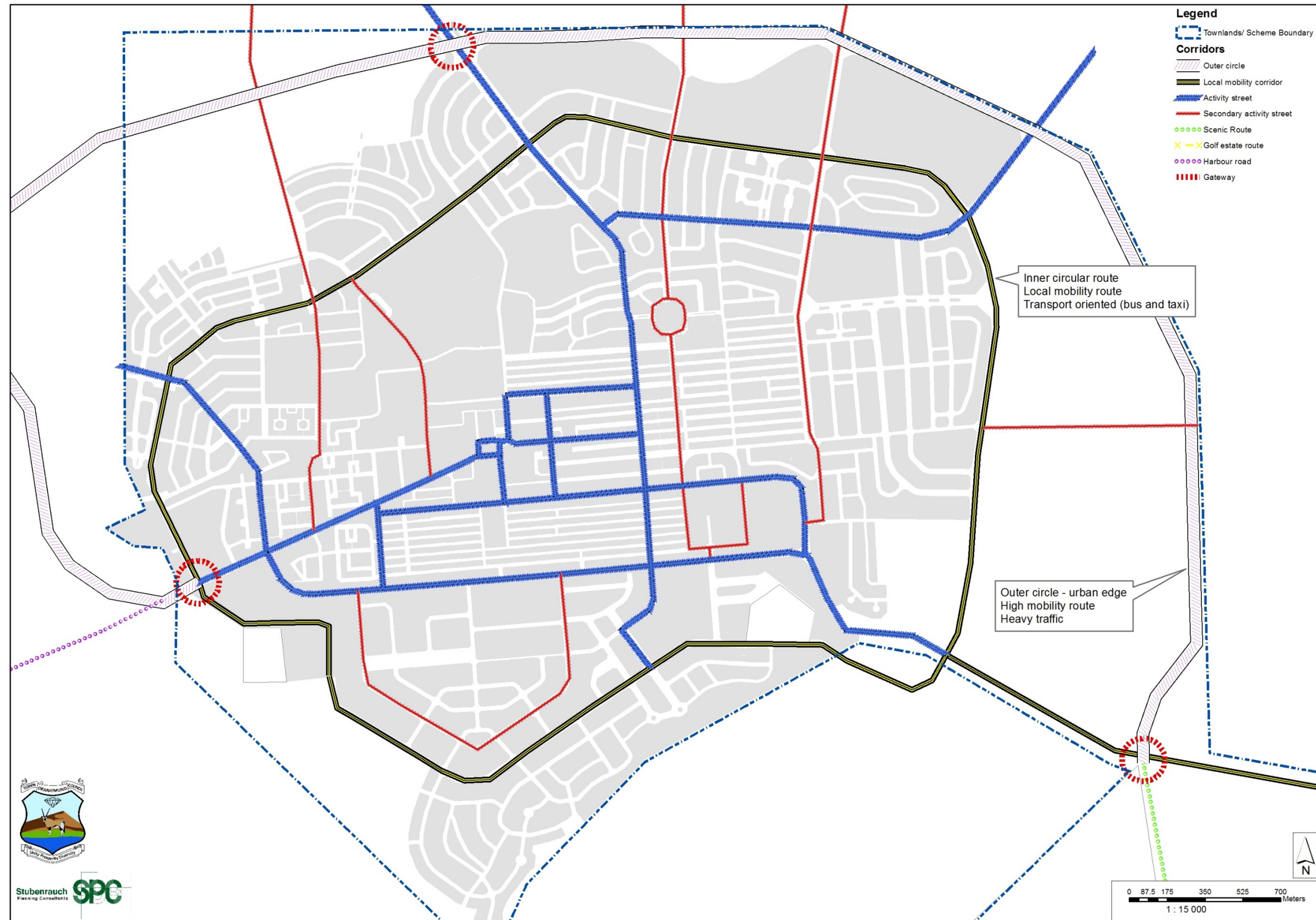


Figure 5 Oranjemund scenic and golf estate route



4.2 BUSINESS, OFFICE, MIX-USE

Objective

The objective is for Council to create business, office and mix-use activities in town so as to encourage investment and ensure that such erven are available once the town opens and thereby ensure diversification of the economy.

One of the key factors in attracting investors is to provide them with a choice, whether it is for an informal investor or a formal investor. Secondly, an opportunity must be attractive for an investor, and Council must make sure that erven are serviced, as an investor will not invest in a town where there are no serviced erven.

Policy Guidelines and Principles

- Due to the restricted townlands the town will have to look at options of densification and intensification. Creating activity corridors and activity nodes has the aim to encourage higher density and intensity activities in these areas.
- The current business area will be expanded east and west by the adding of mix-use nodes to the east and west. Within these nodes office uses with a bulk of 0.5 and 0.75.
- The core business area is encouraged to intensify with higher bulk factors of 3.0.
- Within this CBD area pedestrians are to be priority. Landscaping, street lights and street furniture are all factors that will assist with place making within the CBD.
- Oranjemund has surprisingly few industrial erven. The structure plan has identified additional areas for industries to the south of town.
- The creation of business/ higher intensity nodes is supported in the structure plan. The objective of densification and intensification is to curb urban sprawl. The idea is therefore to create a compact town as far as possible.
- Further away from the central business area will be neighbourhood nodes comprising of higher bulk business. These neighbour or satellite precincts are to

serve the neighbouring extensions with amenities. Care should be taken when allowing typical central business activities within these nodes. These nodes should not detract the importance of the central business area.

- Mixed use areas are mostly situated along activity streets. These mixed use areas should encourage shops on the ground floor; offices on the 1st floor and residential on the 2nd floor. This is to ensure live during the day as well as the night.
- It is also proposed to create a central activity centre in town. Erven 1034, 1035, 1036, 1037, 1038 and 614 has been identified for such a centre. The concept is for the development of a new Town Hall (1). This town hall can be two to three storeys in height with a payment centre on the ground floor, offices on the first floor and the town hall on the second floor. This needs to be state of the art modern building. Number 2 on Figure 8 refers to the activity centre and small shops. This activity centre should be the life of the centrum with activities such as shops, restaurants on the ground floor and possible a gym on the first floor or a health centrum. Residential activities can be allowed on the second floor in order to ensure live in the centrum after 5pm. Number 3 refers to market stalls. These can be operated by tourism vendors selling curio's to tourist. It should be a clean and spacious development. Number 4 is open air markets where vendors can sell clothes, curios and other goods to visitors. Area needs to be kept clean. Number 5 refers to additional commercial buildings where shops can be allowed on the ground floor and offices on the first floor and residential component on the second floor. Number 6 has been identified for an upmarket hotel. This hotel will be linked with pedestrian walkways to the activity centre. Number 8 is the open plain within the development. Within this plain small restaurants and bistro's are to be encouraged with areas on the outside for the visitors to sit and enjoy their lunch or drinks. Trees and plants in the town square will liven up and provide shade. The town square can also be an area for weekend markets. The crucial aspect of the central activity centre is that is must be pedestrian friendly. No vehicle traffic is to be allowed inside and

parking will only be on the outside of the development, with on-street parking.

Additional recommendations:

- Sales agreements on business and industrial erven must state that the new owners have to develop within 2 years. Failing to develop within 2 years will result in increased levies of 10% annually. This is to encourage investors to develop the properties and to prevent a situation as experienced currently in town where erven has been laying vacant for more than 20 years.
- Sales agreements on industrial and business land bought from Council are to stipulate that if the owner wants to sell the property within 3 years, the Council is to get first option on buying of the property. This is to prevent land banking and speculation that leads to long periods of no building.
- Informal business and trade is an important supporter of livelihoods for the low income sector. The structure plan realises this and encourages the informal trade in a healthy and sustainable manner. Illegal trading and vending on sidewalks that causes a nuisance or health risk is however not supported by the structure plan. The structure plan rather encourages the informal trade within a formal setting such as a SME market.
- Selected small informal trading within the CBD area can be allowed with permits from Council. Such permits are to regulate the vending activities in terms of products, hours of operation and cleaning of the area daily.
- One of the biggest factors an investor looks at is the level of services within a town. If the services are not sufficient or non-existence, an investor will not invest.
- Landscaping, tarring of streets and beautification of the town is essential to attract investors. Council needs to undertake a clean-up of the town annually and to budget annually for landscaping and tarring of the streets.
- Council and the business community need to find common ground to work towards the development of the town.
- Betterment fee paid by developers for rezoning within these nodes must be used by Council for the

beautification and development of the streets and pavements within the area.

- Areas earmarked for densification and intensification must still follow the legal rezoning process. To fast track investment and development the Council can consider giving consent for developments in areas within these policy areas.
- Open spaces within town must be retained and maintained. This is one of the features of the town and closing of these open spaces is not recommended by the structure plan.

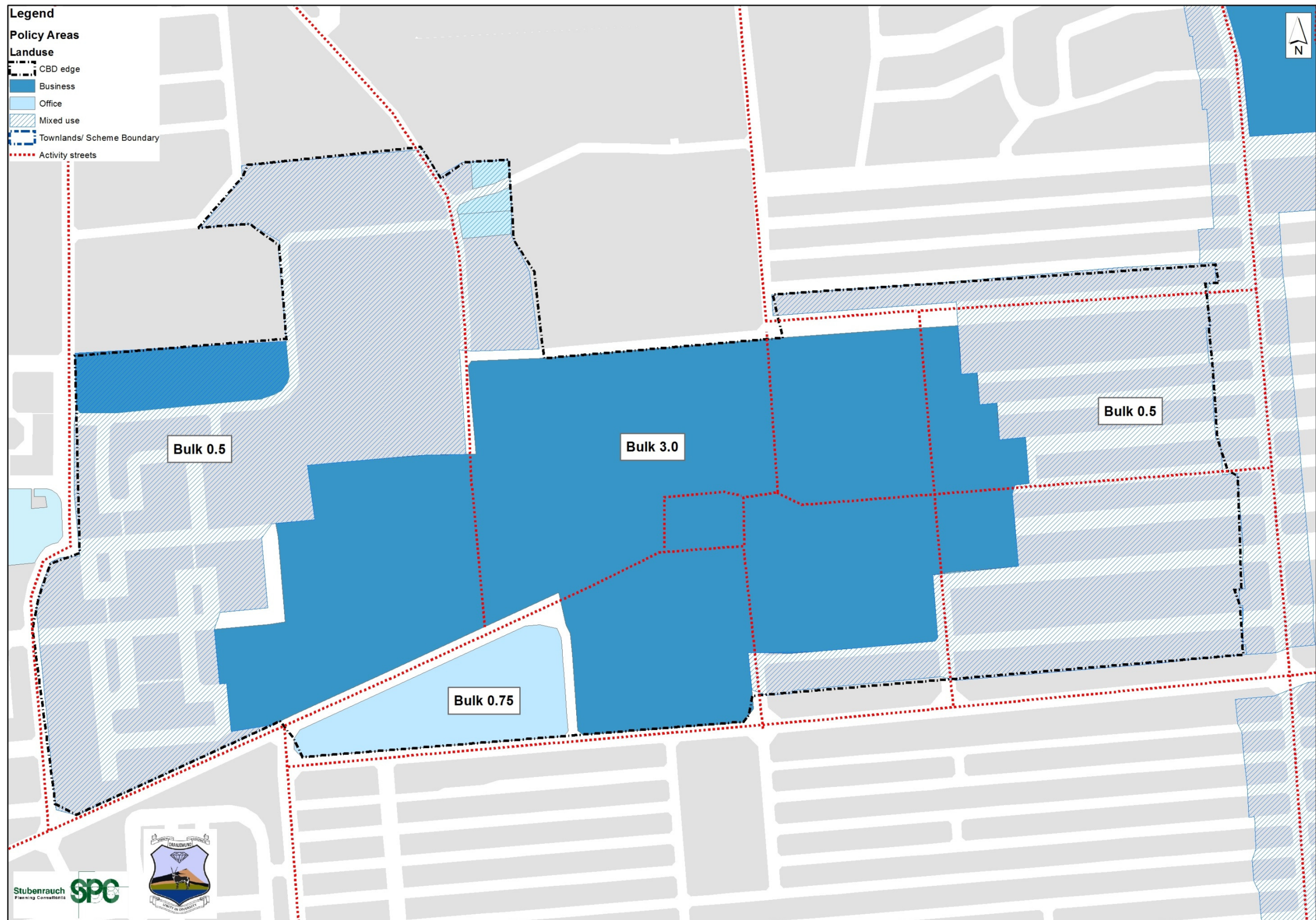


Figure 6 Business and office policy



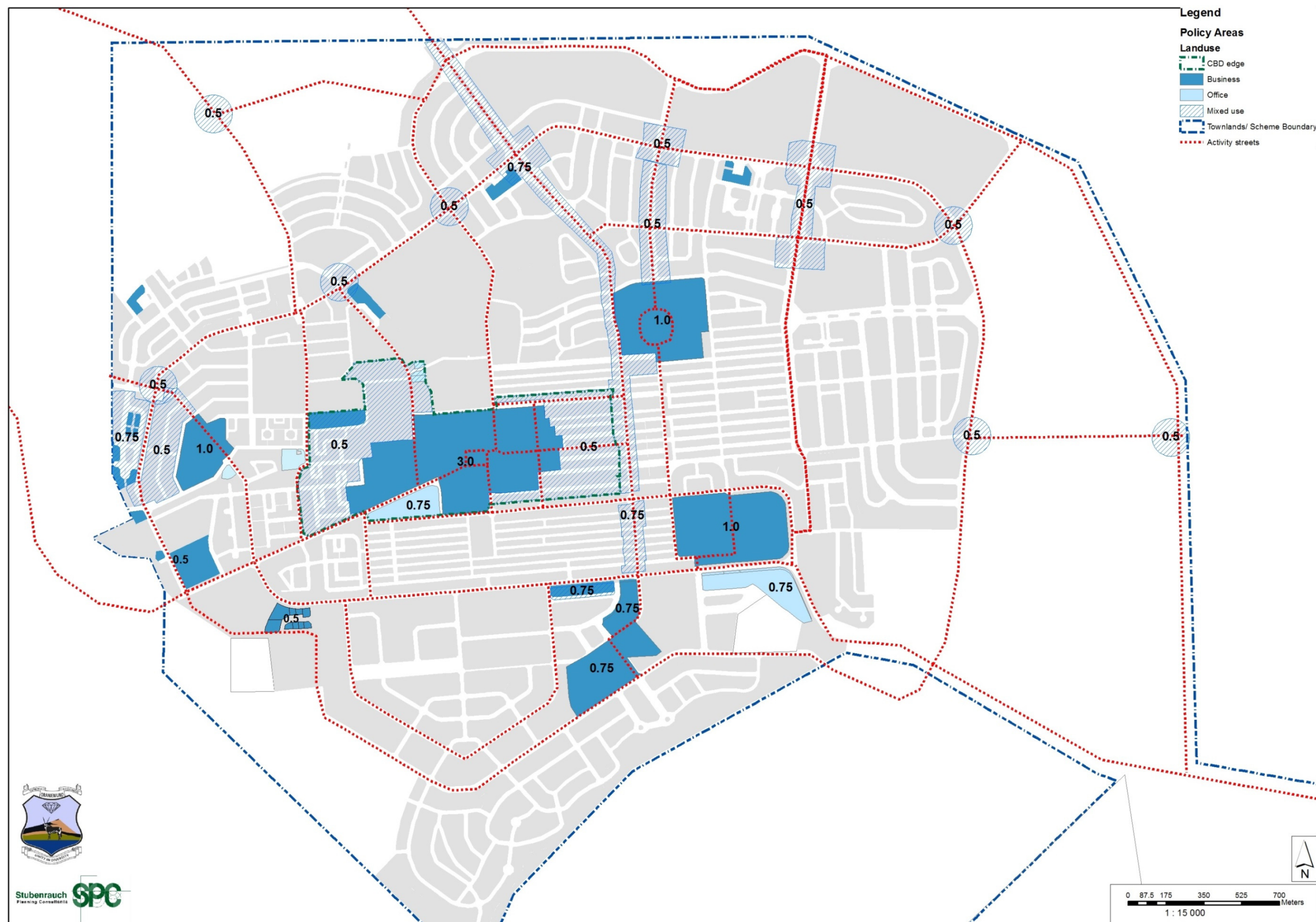


Figure 7 Business and Office Policy

Figure 8 Town Activity Centre



4.3 INDUSTRIES AND AGRICULTURE PRODUCTION

Objective

Council must start diversifying its economy in for the town to become sustainable. The town cannot, once open, solely rely on diamond mining. Other incomes must be sought and some of these are attracting investors in the industrial and agriculture production sectors.

Oranjemund is situated in an arid area, but with water available from the Orange River, production of certain agriculture crops can be a positive aspect for the town. The distance of Oranjemund from harbours and distributing centres might prove difficult for export of products, but not unsurmountable.

Policy Guidelines and Principles

- Industrial and Light industries provided to the south of town for industrial activities.
- These industrial activities not to include noxious industries due to the predominant wind direction.
- Diamond polishing, cutting and other such spin-off activities can be established within the industrial extension.
- Repair of ships, equipment for mining and so forth are some of the activities that can be encouraged in the industrial area
- Irrigation along the river is encouraged. Investors will have to undertake mitigation measures to prevent flooding during flood times
- Agriculture industries such as dairy farming, chicken farming encouraged north of road. Townlands will have to be extended to include the demarcated area into townlands area
- A logistics, truck port and heavy industrial area have been earmarked east of town, just outside the townlands boundary. The boundary will have to be extended for these activities.

Additional recommendations:

- Sales agreements on industrial erven must state that the new owners have to develop within 2 years. Failing to develop within 2 years will result in increased levies of 10% annually. This is to encourage investors to develop the properties and to prevent a situation as experienced currently in town where erven has been laying vacant for more than 20 years.
- Sales agreements on industrial land bought from Council are to stipulate that if the owner wants to sell the property within 3 years, the Council is to get first option on buying of the property. This is to prevent land banking and speculation that leads to long periods of no building.
- One of the biggest factors an investor looks at is the level of services within a town. If the services are not sufficient or non-existence, an investor will not invest.
- Landscaping, tarring of streets and beautification of the town is essential to attract investors. Council needs to undertake a clean-up of the town annually and to budget annually for landscaping and tarring of the streets.
- Betterment fee paid by developers for rezoning within these nodes must be used by Council for the beautification and development of the streets and pavements within the area.
- Areas earmarked for densification and intensification must still follow the legal rezoning process. To fast track investment and development the Council can consider giving consent for developments in areas within these policy areas.
- Open spaces within town must be retained and maintained. This is one of the features of the town and closing of these open

Figure 9 Agriculture and Logistics

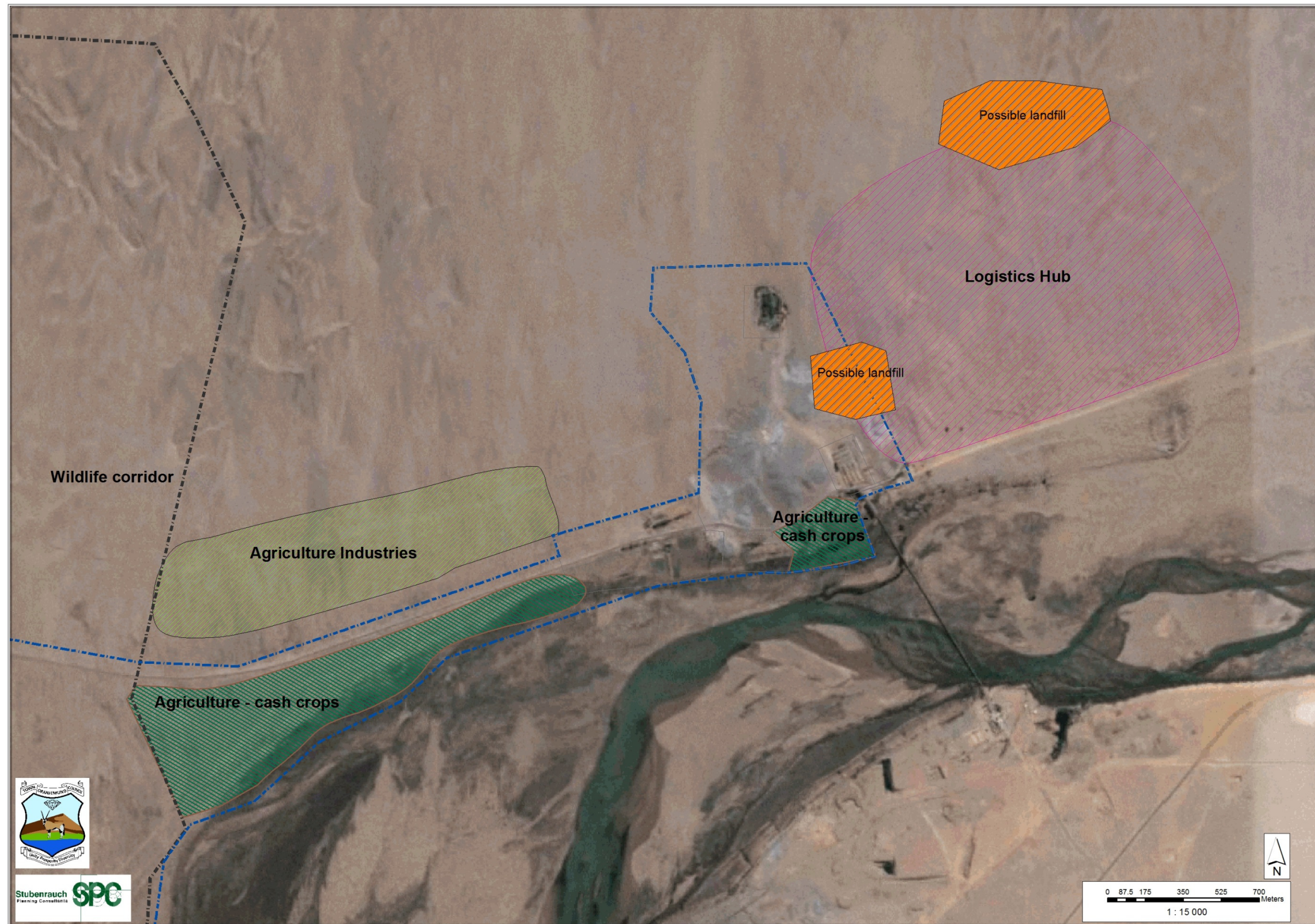


Figure 10 Industrial and light industries within town

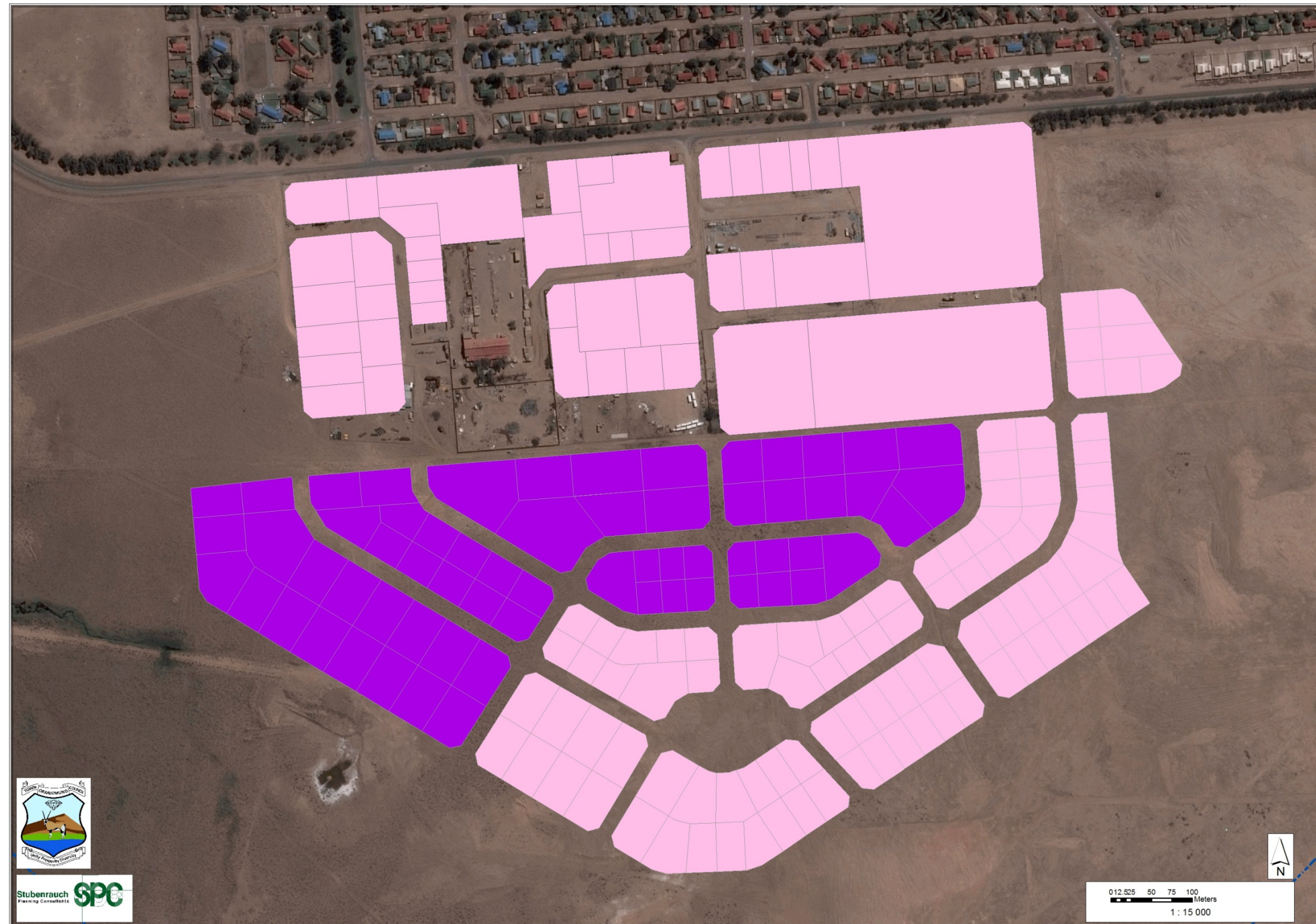
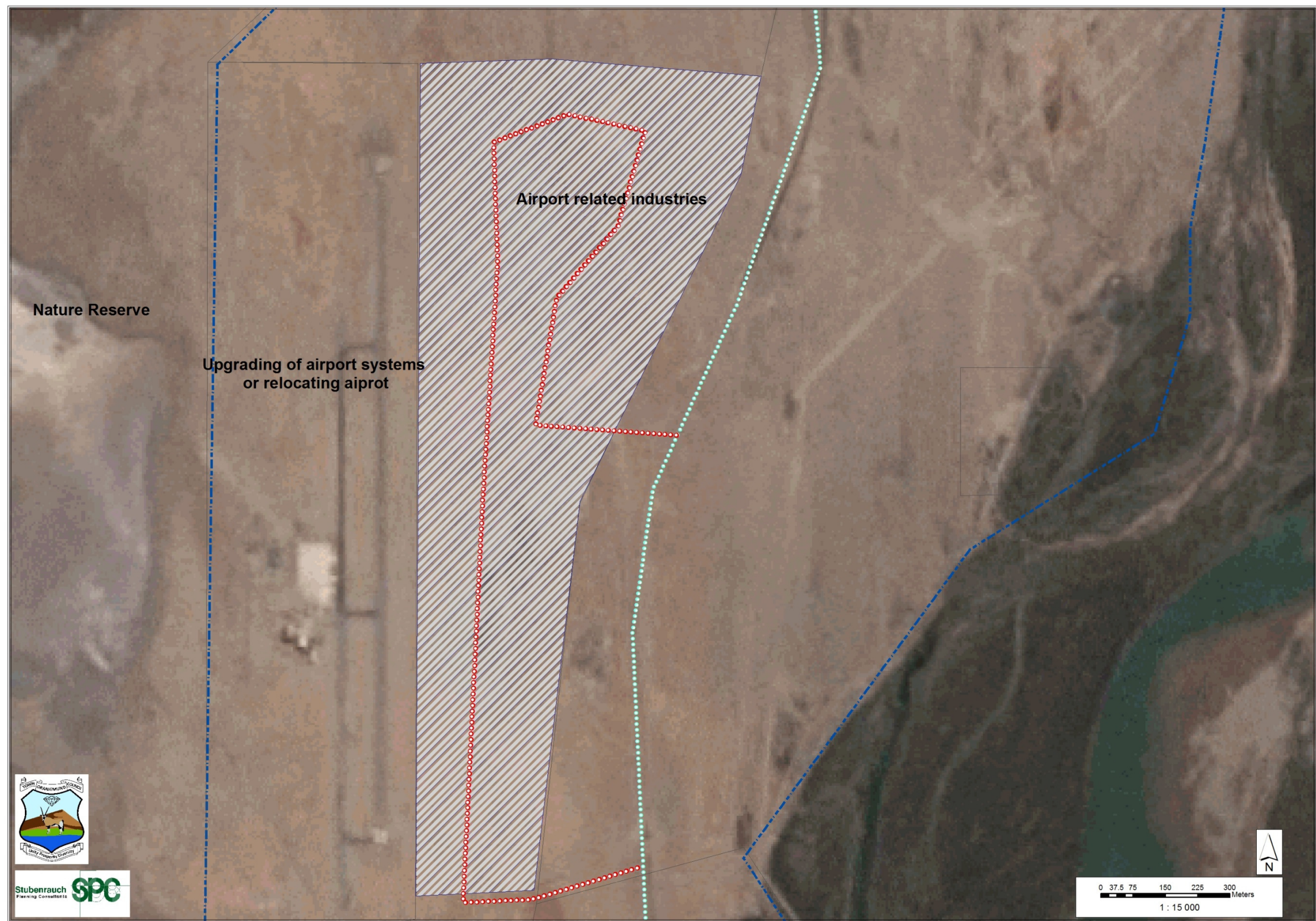


Figure 11 Airport related industries



4.4 OPEN SPACES AND RECREATIONAL AREAS

Objective

Being surrounded by the national park and mining licenses has an impact on the activity of the community. Movement outside of the townlands area are controlled and the community of Oranjemund only has the current recreational facilities in town, the golf club and the beach area. It is the purpose of the structure plan to retain these recreational activities for the enjoyment of the community of Oranjemund.

Secondly, the open space system in Oranjemund is unique. Oranjemund is probable one of the few towns in Namibia that can be proud of a system of open spaces enjoyed by the community as well as the wildlife. This makes the town unique and is a trait that needs to be preserved.

Policy Guidelines and Proposals

- Maintaining the open space systems is crucial. New extensions being planned is to follow the concept of linear open space creation, central neighbourhood parks and other forms of open spaces.
- Council to utilise betterment and endowment fees paid for subdivisions and rezonings to develop the open spaces within town
- Council to budget annually and strategically develop the open spaces in town with one park being developed every year. These open spaces can be developed either in the form of desert gardens, informal soccer fields or play parks. The objective is not to leave these areas open for dumping of rubbish.
- Encourage business owners, institutions and organisations to become involved in the development of the open spaces.
- The beach area is crucial for recreational activities. The idea is to create a recreational hub where visitors/public can kayak on the river, play golf, do bird watching, go for a walk/ hike in designated areas, overnight at the hotel or at the demarcated camping

area or even rent one of the beach houses. Or even just to go for the day to beach where children can play and have lunch at the hotel.

- Figure 12 shows the proposals for the beach precinct. The structure plan proposes to link the golf club to the beach activities through integration of activities. A low-key eco-friendly hotel is encouraged at the current golf club site. Accommodation units on the periphery of the greens can be considered with no more than 20 units. The development is to be low-key development. Similarly a hotel with not more than 20 rooms can be investigated at the current Yacht club with low key eco-tourism chalets, built on stilts can be investigated on the outskirts of the “lagoon” as indicated on figure 12. No more than 15 chalets. The lagoon will be the pivotal recreational area within this development and (with due consultation of water regulations and environmental reports), water can be abstracted from the Orange river, through a channel/ Marina to the lagoon to ensure fuller capacity of the lagoon year round. Providing day-camping facilities and ensuring that the public still have access to the facility an area has been identified for day-camping/ picnic facilities at the lagoon and at the beach area. These areas must be cleaned daily and care must be taken with off-road vehicles. The dune hummocks towards the beach and the river edge next to the river are extremely sensitive areas and no-off road driving is to be permitted in these areas. The raised walkways are to be constructed within this area to limit the impact on the area. An overnight camping facility can also be provided next to the lagoon, but should be low-key, not more than 15 camp sites and off-road driving/ quad biking will not be allowed in the area. The remainder of the development will be reserved for a nature area for walking and hiking and for wildlife movement. No buildings or development to be within this nature area. Important to note is that detailed environmental studies will have to be undertaken to assess this proposal and engineering solutions will have to be sought to prevent possible flooding of this area in the future.

Swartkops Development Area

- Development of Swartkops Nature Reserve will add an additional recreational opportunity for the inhabitants of the town. The proposal is to increase the tourism potential by allowing for additional tourism
- An area adjacent to Portion 10 has been identified for estate developments and tourism facilities. This must be an eco-tourism development as the Swartkops Nature Reserve is close by. Such a development should not have a negative impact on the reserve.
- The Swartkops reserve is actually limited to the hill itself. It is recommended that the area to the north be taken out of the portion reserved for nature reserve zoned for estate or hospitality activities, as the real sensitive area are the hill itself and not the northern area.
- Open spaces within town are quite abundant and the structure plan recommends these to be maintained. The Pink Pan to the south of town is an important biodiversity area and is to remain for nature reserve purposes.
- The area between Extension 8 and the townlands boundary to the west is to be reserved for urban farming purposes. Here activities such as growing of palm trees (watered by grey water from the sewage system) and other type of urban farming can be undertaken. Care must be taken with fertilisers in this area so that it does not pollute the pink pan.
- The area to the east of the town is an important gateway for wildlife moving into town. This is an important corridor that must be kept free from development.

Additional recommendations:

- Future developments / extensions must provide between 5 to 10% of functional open space systems within new developments. Open Spaces created within township establishments are created for a purpose and the closure of such open spaces are not recommended.
- Higher density developments such as townhouse/ flats development should provide some aspect of communal

open space for residents, or alternatively enter into agreements with the Council for development of an open space or even the development of the pedestrian area in front of the development or in proximity to the development.

- Investors in town and business owners should be encouraged to become involved in developing parks and streets in front of their buildings.
- The community must be encouraged to become involved in maintaining and developing the parks. It is not only the Council that is to be involved.

Figure 12 Beach precinct proposals



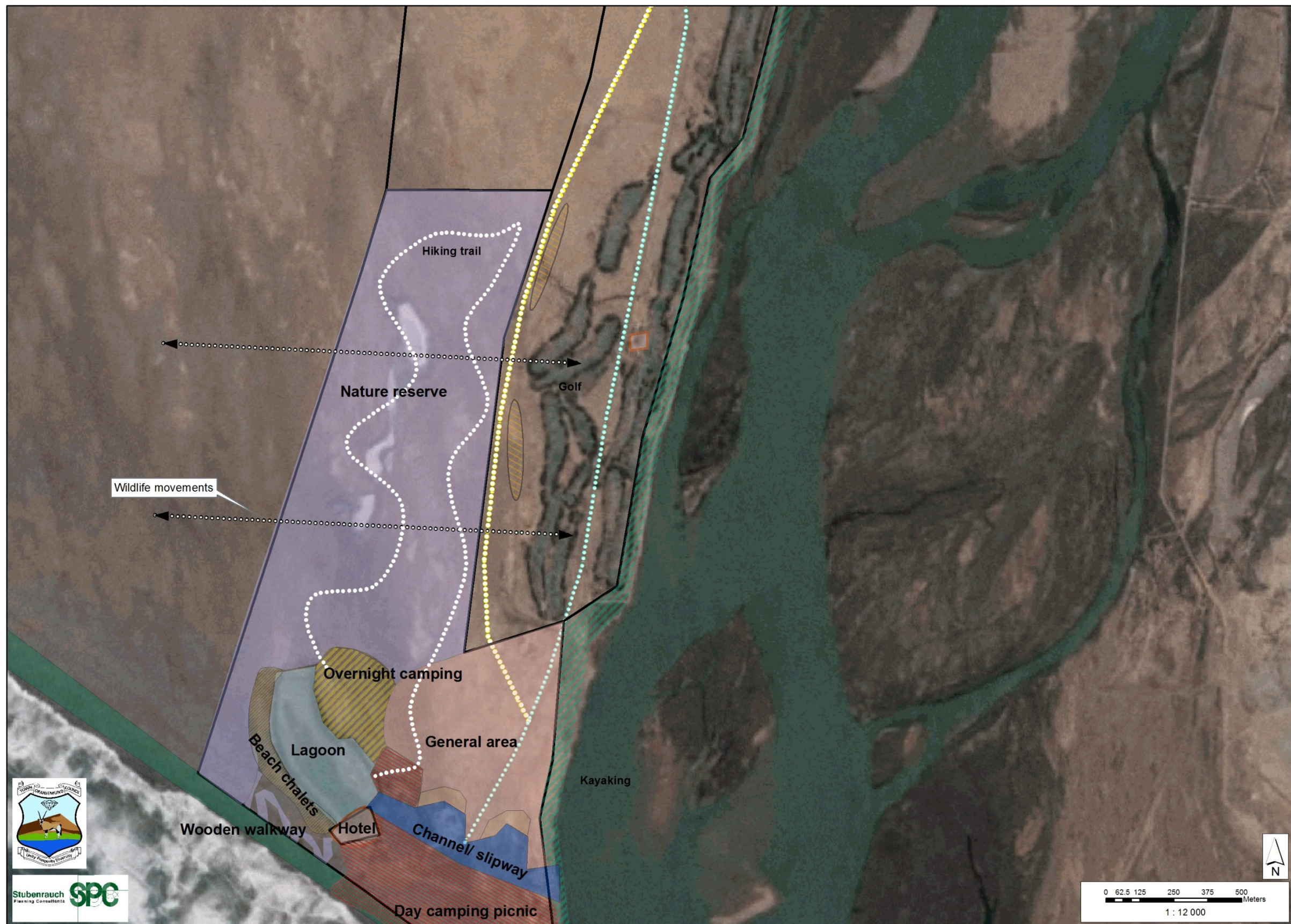


Figure 13 Swartkops Reserve Precinct proposal

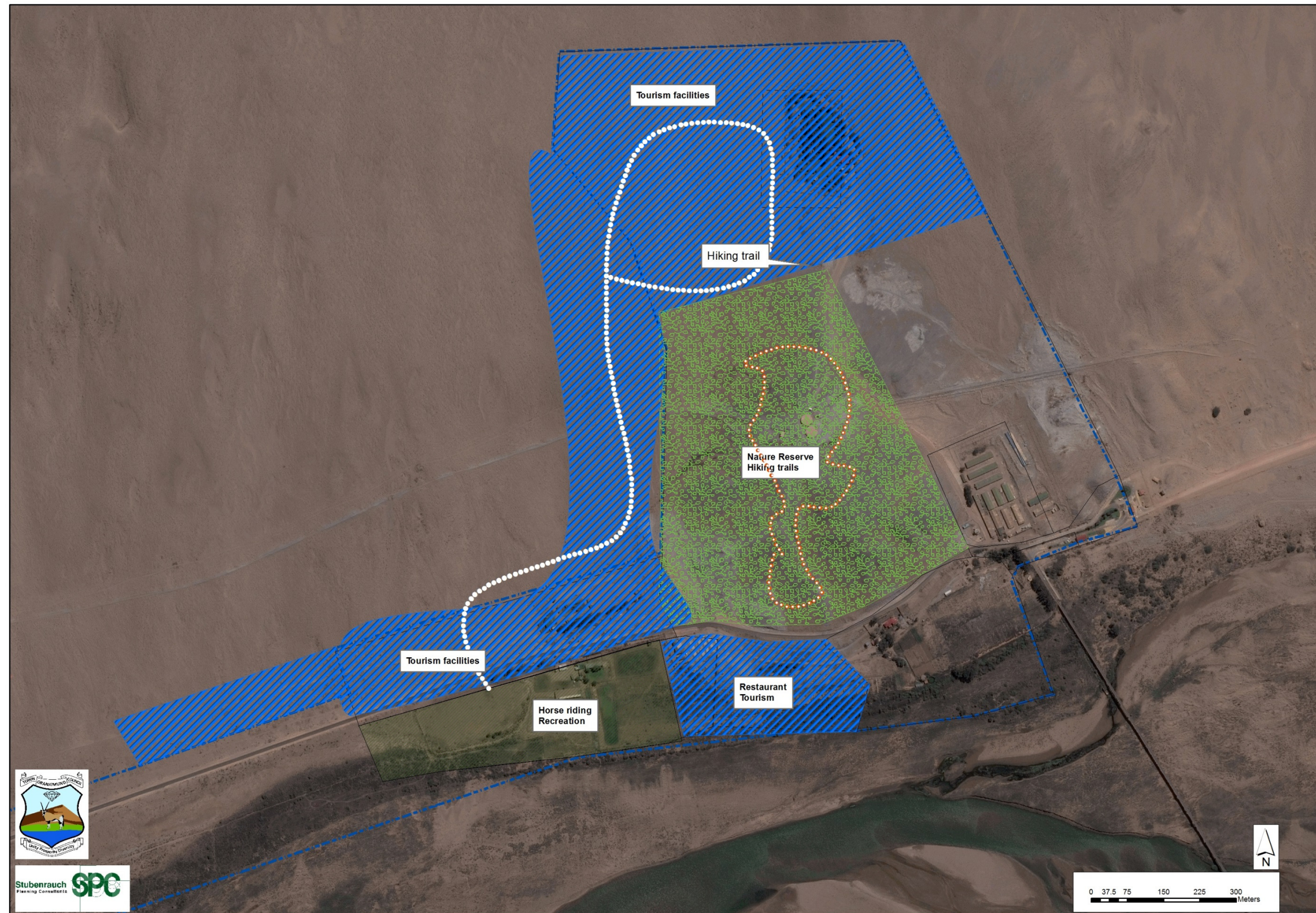
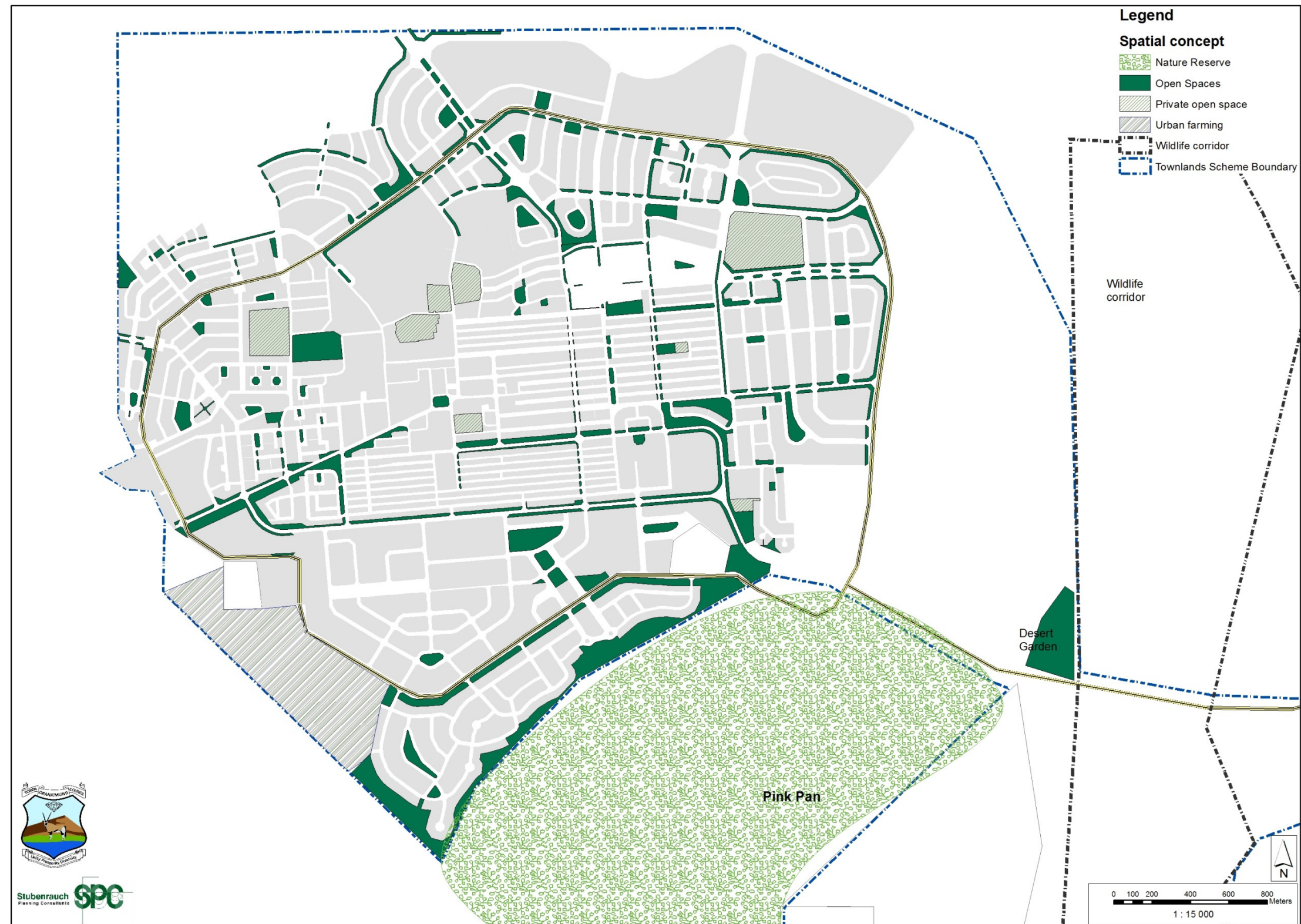


Figure 14 Open space system in town



4.5 RESIDENTIAL COMPONENTS

Objectives

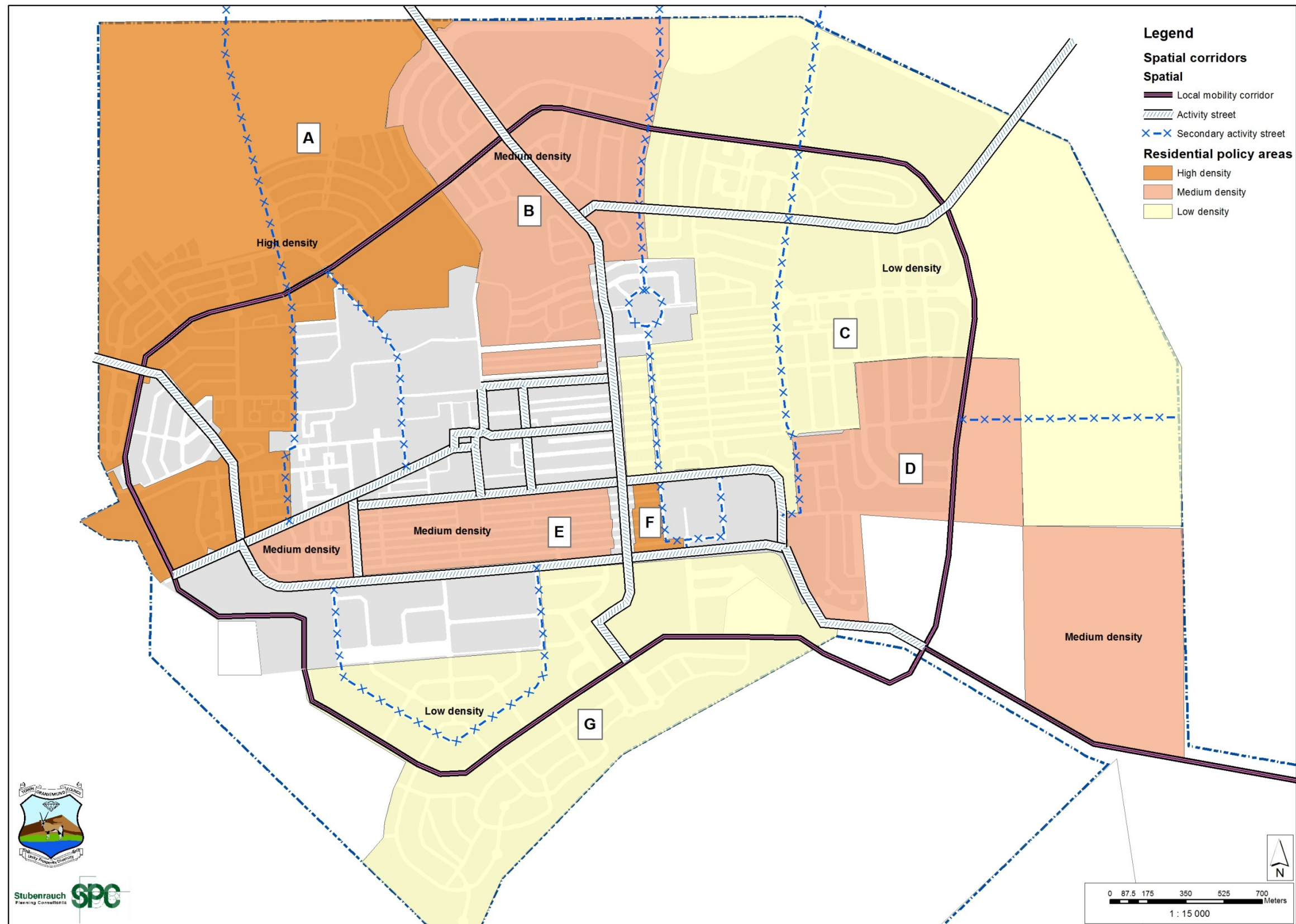
The Council needs to pro-actively plan for residential erven in order to avoid a back-log once the town opens. The Council also has to ensure that potential investors have different choices to choose from – from low density to high density developments.

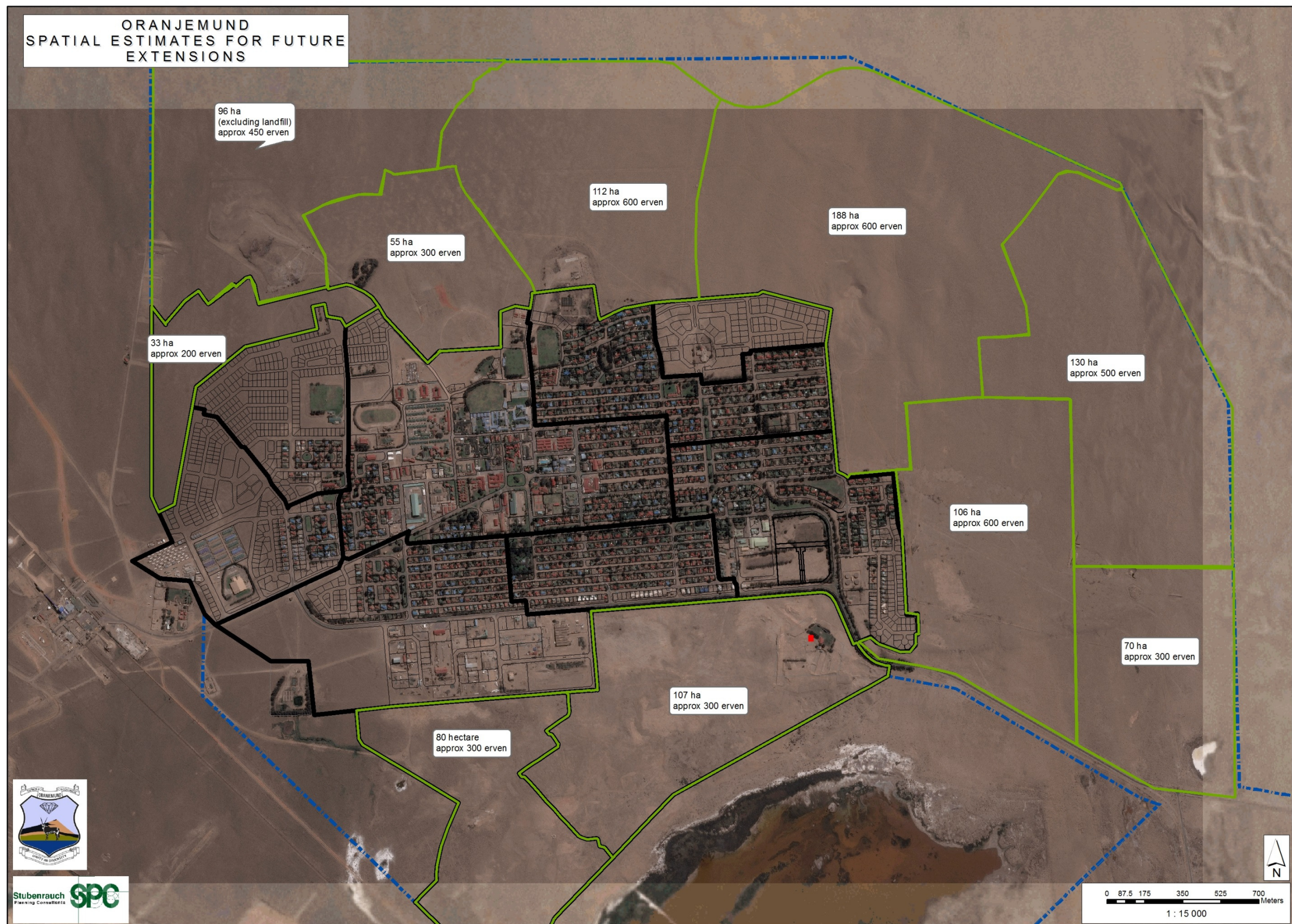
Policy Guidelines and Proposals

- Oranjemund Town Council has to provide different densities and type of land-use activities in order to attract investors and cater for a variety of different investors – being from low income to high income investor.
- The structure plan recommends the overall densification of the residential neighbourhoods in town. Densification does not necessarily refer to high densities of 1:100. In the case of Oranjemund it refers to densification of neighbourhoods to one higher category – for example: if an area had a density of 1:900, the recommendation will be to densify the area to a density of 1:600. NOTE: the Structure Plan does not intend to take away rights; therefore owners of properties still have to undertake the rezoning process.
- The structure plan further encourages the establishment of accommodation establishments such as guest houses and bed and breakfast establishment on single residential erven (in line with the Town Planning Scheme and the Tourism Board Act). Areas suited for such accommodation establishments are those situated along activity streets. The aim of this allowance is for home owners to turn their existing houses into accommodation. The character of the area is to remain residential of nature and these activities should not be large scale activities.

- The residential policy as depicted in figure xxx intends to encourage existing home owners to start intensifying and densifying. This means that either the home owner can apply for rezoning or if the erf size allows, to subdivide without rezoning.
- Areas identified as mix-use areas are encouraged to intensify with mixture of uses such as offices and residential above ground floor or business and residential above ground floor. This will also then ensure that mix use areas have surveillance, even at night. Within these mix-use nodes or corridors densities of 1:100 can be encouraged.
- The structure plan also encourages the establishment of second dwellings, as per the Town Planning Scheme, on single residential erven. These second dwellings, cannot be alienated, but can be rented out.
- The structure plan encourages developers of higher density developments to provide recreational space within the development and to landscape/ beautify the street in front of the development
- Each new township to comply with the requirements for provision of open spaces and other amenities.
- When purchasing residential properties from Council, the sales agreement are to stipulate that the owner must develop within 2 years. This is to avoid the situations in town where prime property remains vacant for many years. Such an agreement is to stipulate that if the owner does not build on the property within 2 years, the rates and taxes to be levied will be increased to be based on the value of a build property.
- Betterment fee payable for rezoning activities should be used by Council for construction of pavements and landscaping within the particular extension and development of open spaces within the neighbourhood.

Figure 15
Residential policy
for existing town





4.6 SUB-REGIONAL SCALE (TOWNLANDS)

Objective

- Relocation of the landfill site
- Relocation of airport
- Utilisation of airport site for township development
- Expansion of townlands
- Training centre
- Tourism attractions based on mining
- Unique golf course
- Mining technology college
- Cemetery site expansion
- SME park on Erf 901 Extension 3
- Expansion of townlands Northwards
- Opening of road to Lüderitz through Sperrgebiet

Policy Guidelines and Proposals

- The existing landfill site poses a health risk to the community due to its proximity to the expanding town. The landfill site is to be relocated to east of town, just east of the entrance gate into Oranjemund. Detail Environmental Studies will have to be undertaken for the decommissioning, identification of site and relocation of site.
- The current airport is within the fog belt which results in flights having to turn around to Windhoek. DCA either has to establish the proper systems to allow for landings in such situations or an alternative more suitable site needs to be identified for the airport. Because Oranjemund is such a distance from other towns and centres, if the town wants to encourage investment it will have to look at transportation systems. If flight schedules are unreliable it will have an impact on visitors to the town.
- By 2030 Namdeb should have finalised their exploration work on the areas north of the current townlands. This is to enable the town council to expand the townlands to the north by 2030. The area adjacent to the entrance gate is priority for a logistics / truck port and will have to be expanded by 2025.

- Establishment of a harbour/ floating port – this is still under feasibility by Namdeb and exact position not certain. This will be ascertained after feasibility completed.
- Opening of road to Lüderitz. To encourage interconnectivity and increase access the road to Lüderitz through the Sperrgebiet is a project that will over the long-term take place
- Encouraging mining tourism will be an economic boost for the town. This can be done by allowing tours to some of the closed down mines, where tourist can have the opportunity to “dig” for diamonds like in the old days.
- Promoting the golf course as a unique course.
- Establishment of a mining technology college. This can contribute also to mining at Alexander Baai and encourage the training of staff at such a college.
- Creation of a techno/ institutional park to the east of the existing town. Solar research, institutional activities, mining college and other type of institutional activities.
- Wildlife corridor to east of existing town to ensure access of wildlife to river and town.
- Activity park in the new extensions. Activities such as restaurants, skateboarding, paint ball, kiosks and general entertainment activities. No shebeens, no bars, no clubs and no casino's.
- Expansion of townlands will most likely take place to the north and east of the town as indicated in the figure below. The northern extension will be long-term while the extension between Swartkoppe and town and for the logistics hub will be short to medium term projects.
- The current cemetery site will be expanded to make provision for future needs. The new site will measure approximately 4.3 hectares. If this site is fully utilised by 2030, a second site will be identified in the newly expanded townlands area.
- Council identified Erf 901, extension 3 as the site for a SME park. The erf is large enough for such an activity and situated on one of the activity streets.
- Identification of a long-term road/ rail corridor north of town. This will be 2030 – 2050 project if the harbour is

developed, Kudu Gas and if mineral deposits in this area has been mined. Detailed feasibility studies and geological, geophysical studies will have to be conducted to establish the precise locality of such a corridor.

Figure 16
Townlands

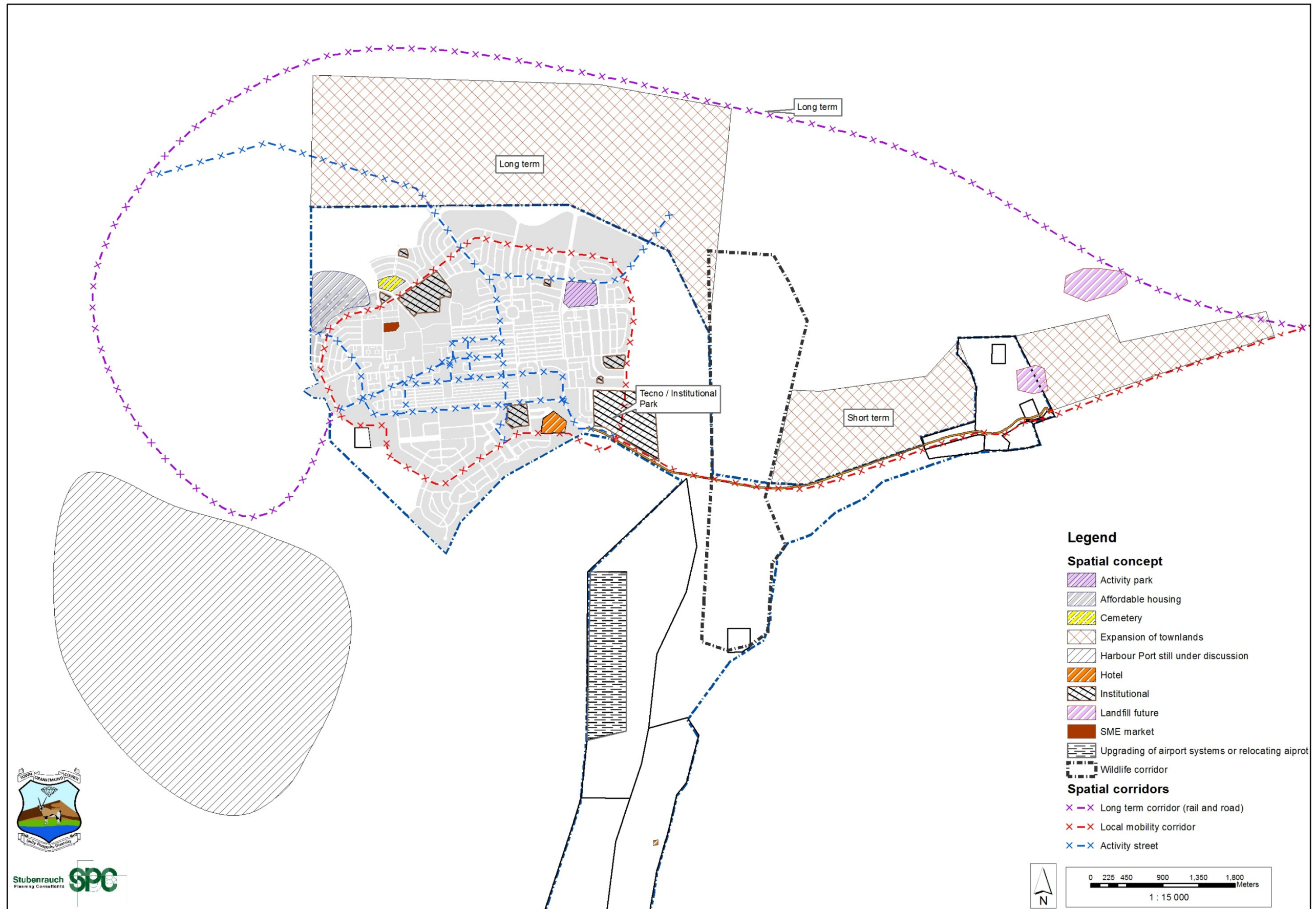
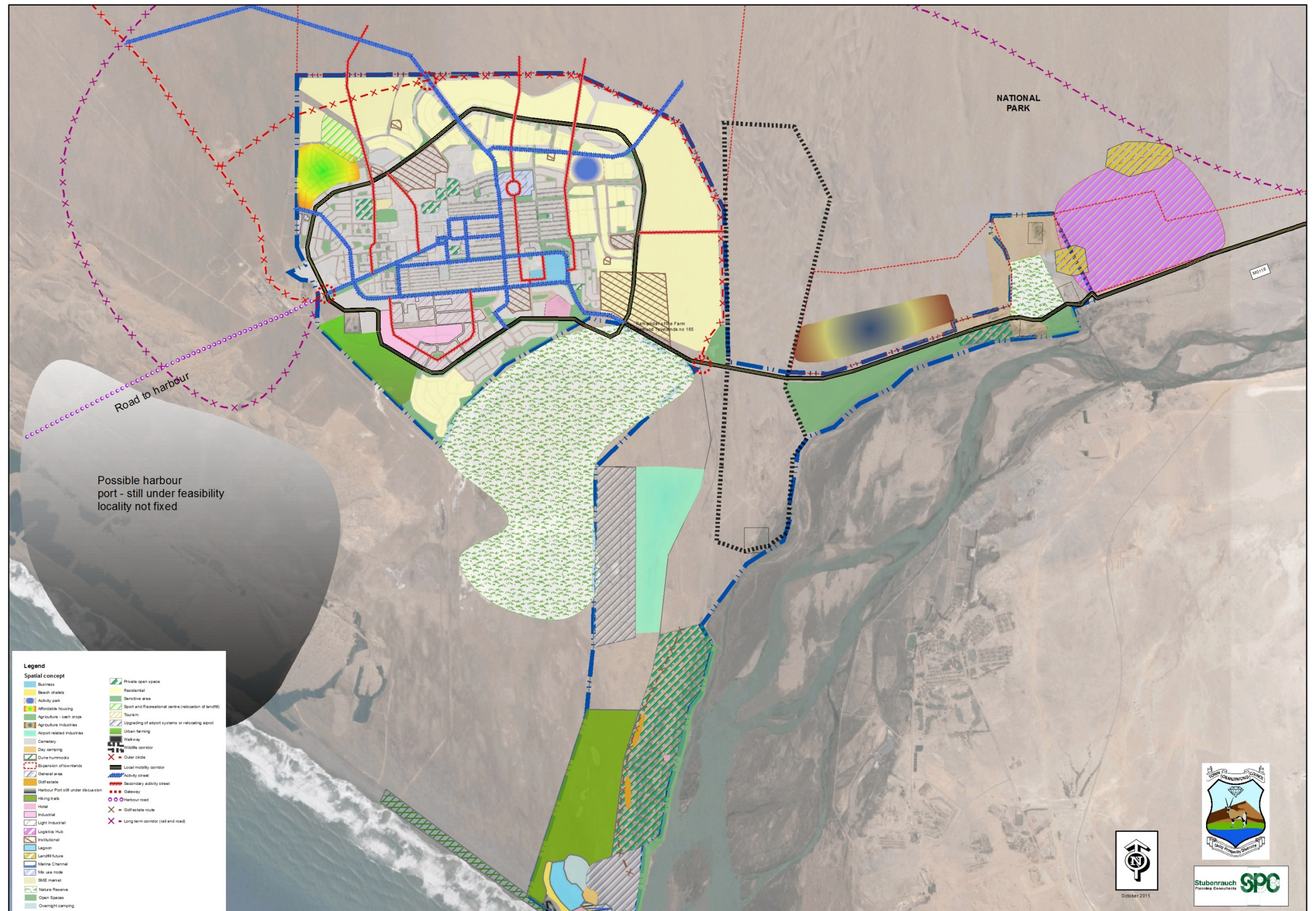


Figure 17
Draft
Spatial
concept



CHAPTER 5 - IMPLEMENTATION AND ACTION PLANS

			2016				2017				2018				2019				2020			
Structure	Plan	Priority	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
recommendation																						

CHAPTER 6 CONCLUSION

To be completed once draft accepted

ANNEXURE A: FUTURE APPROACHES TO RESIDENTIAL DEVELOPMENT

Using sustainable building technology is only one aspect of sustainability and should not be considered in isolation to other sustainable approaches to Planning and Urban Design as a whole.

In Oranjemund where there are a series of activity corridors where density should be encouraged, it is recommended that the Council seeks to promote the development of 3 storey high residential 2 type buildings with mixed uses on the ground floor. These mixed uses can include business and office uses, but the use of the ground floor should be demand driven.

Sustainable building technology

The purpose of this section is to inform the Council of some of the technologies that are available that can increase energy saving within the context of building construction.

When new residential buildings and neighbourhoods are designed within Oranjemund, observation of best practice in environmental sustainability should be encouraged. The abundance of sunlight within Namibia creates both constraints and opportunities when considering individual building designs. A range of measures can be employed by the building designer to mitigate or exploit environmental conditions, and the cost of these measures can range from being relatively cheap to expensive, and in many cases provision needs to be made by the builder or developer of increased capital costs versus lower operational costs to ensure that the design solution remains economically feasible and deliverable.

The Council should try to balance the promotion of sustainable principals in design with possible additional construction costs which may discourage development. Energy efficiency in terms of building design should also be

considered in order to lessen the burden on power producers, distributors and suppliers in terms of domestic demand. Which can result in more electricity capacity being available for industrial demand, or even an overall net energy saving. Design criteria should also be cognizant of the impact of climate change.

Sunlight

Solar gains need to be mitigated through intelligent building design so that an acceptable internal ambient temperature can be achieved without the need for excessive use of electricity, water and fossil fuels, as is the case with traditional mechanical / electrical air conditioning systems.

Passive mitigation measures can include coatings on roof surfaces to reflect heat, roof insulation to reduce heat gained through conduction, increased levels of thermal mass in floors and wall finishes to absorb heat during the day (and releasing it in the evening), external louvres / climber plants to shade areas of glazing, openings on each side of the buildings with an appropriate floor-to-wall ratio to promote cross ventilation, and high level openings / pitched roofs / cowls to promote a stack effect, for passive cooling.

Cooling

External water features may also be used to cool passing air through evaporation, but analysis will need to be done on the effectiveness of this in areas of such high levels of evaporation, and where disease carrying insects may be prevalent. Active mitigation measures can include Cooling Towers (passing warm air drawn through evaporating water and distributed through stack effect) and Earth Tubes (cooling of air by drawing it through pipes in the ground during the day). But these active mitigation measures require a level of knowledge from the building designer that may not always be available.

As well as mitigating the effects of sunlight, sunlight energy can be harvested as a source for hot water through the use of solar collectors, for the generation of electricity through the use of Photovoltaic's, and as a source of ventilation through 'Solar Cooling'.

Solar Cooling is the use of a variety of techniques to convert sunlight energy into cooling, i.e. using photovoltaic-gained electricity to pump air around a building that has been passed over a desiccant to extract moisture. Solar Cooling is one of the most technologically complex environmentally-friendly solutions, but it has been done, and designers of larger more complex buildings with larger budgets should be encouraged to explore this technology if desirable conditions cannot be reached with passive measures alone.

Heating

When internal heating is required, this can be provided either through the slow release of heat stored in the building's thermal mass as it cools down in the evening, or through the use of ground heat pumps, providing, for instance, under-floor heating.

It may be that on analysis, the design criteria may not be met economically with any of the above techniques. In this case, a mixed approach should be promoted in which at certain times of the year / or times of the day more conventional approaches to heating and cooling strategies are employed. The buildings will then be operated in what is referred to by building designers as 'mixed mode'.

Embodied Carbon and Water

In addition to building performance, criteria such as the environmental cost of the buildings materials and construction should be considered, particularly embodied carbon, (through materials and transport of materials), embodied water through materials (wet and dry) and the re-usability of the buildings materials when the building comes to the end of its life-cycle.

Assessment Tools

For a comprehensive assessment of the sustainability credentials of a building, the Local Authority may wish to request developers to self-assess their building by using an environmental assessment tool. Unfortunately, an environmental assessment tool has not been developed for Namibia, which means that developers wishing to self-assess their building will need to use one of the globally recognised standards to assess the sustainability of buildings. In the

English language, the most commonly used international standards and performance evaluation mechanisms are:

- LEED NC (buildings scale) - This is a tool developed by the US Green Building Council
- BREEAM (buildings scale) - This is similar to a tool that has been developed in the UK.
- GREEN STAR – This is a similar tool developed in Australia and also being used in South Africa.

It should be noted that the use of these self-assessment tools does require a qualified assessor, and that acquiring such a person will have a cost implication, therefore the Council should consider the costs of this when approaching developers.

Reference Guides

A short publication 'Guidelines for Building in an Energy Efficient Manner', published by REEEI and the Habitat Research & Development Centre in Windhoek, provides guidelines on how to incorporate energy efficiency and renewable energy technologies and principles into housing designs.

This diagram tries to show, in a very basic way potential building typologies that could be developed for higher density three storey buildings in Oranjemund

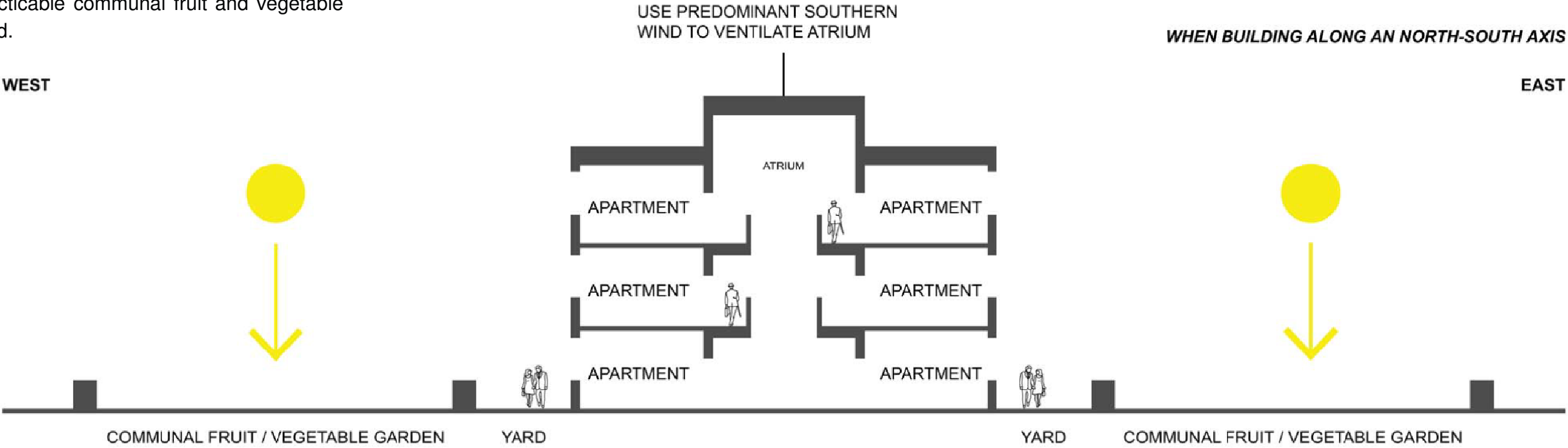
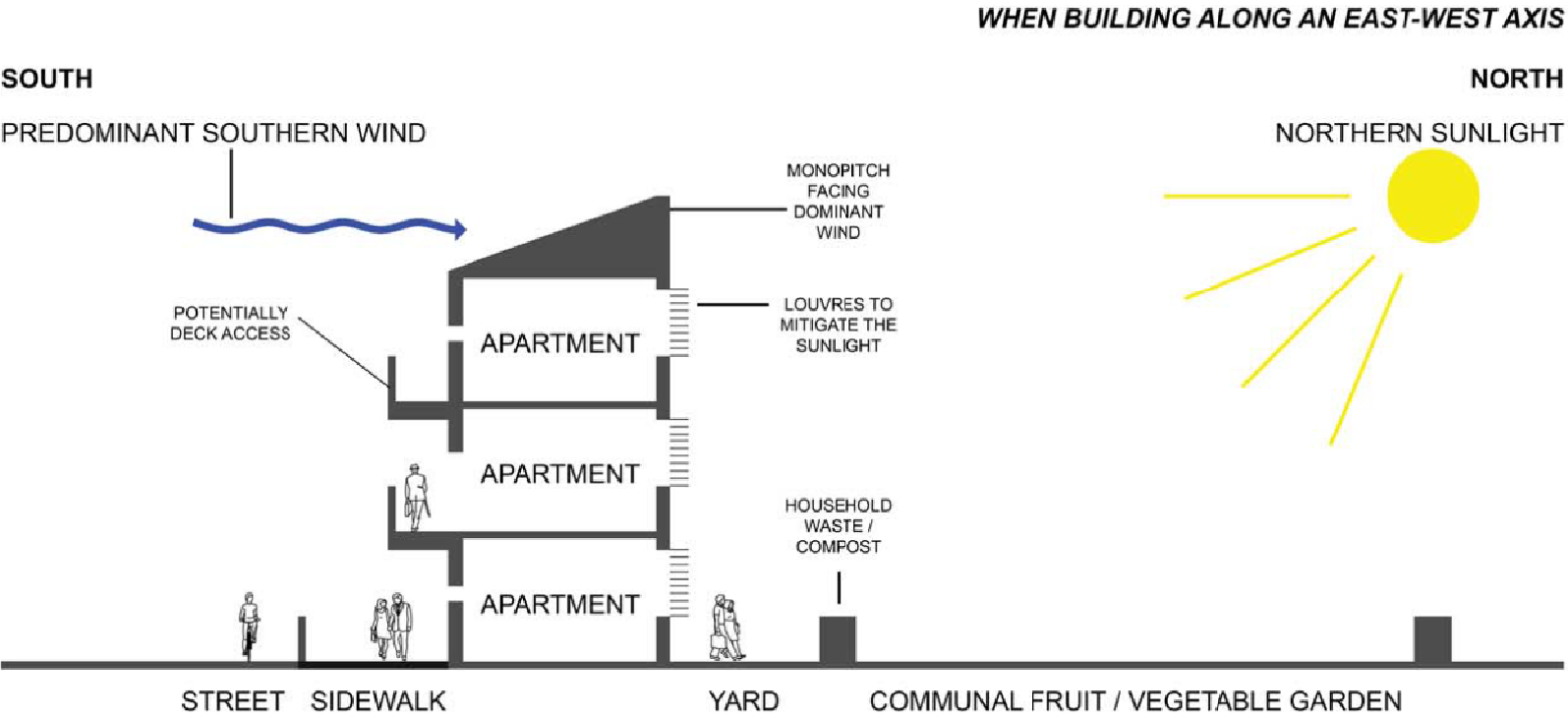
The design of the building should be determined by the direction it is facing.

When Buildings are Constructed Along an East-West Axis

The south face of buildings should have louvres to mitigate sunlight. If deck access is being integrated into the design, then these should be on the colder north side of the building. Household waste should be collected for use as compost and where practicable communal fruit and vegetable gardens should be promoted.

When Buildings are Constructed Along a North-South Axis

Atrium buildings should be considered which use the predominant wind to ventilate the atrium. Individual apartments can then be west and east facing, household waste should be collected for use as compost and where practicable communal fruit and vegetable gardens should be promoted.



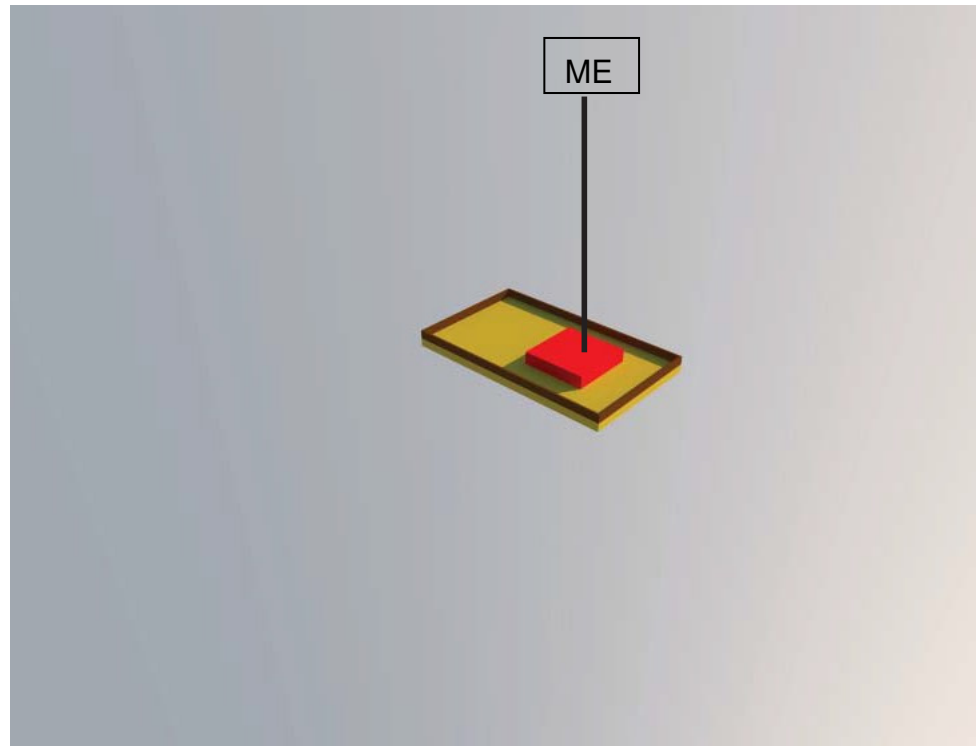


Fig. 93 One Building Developed in Isolation

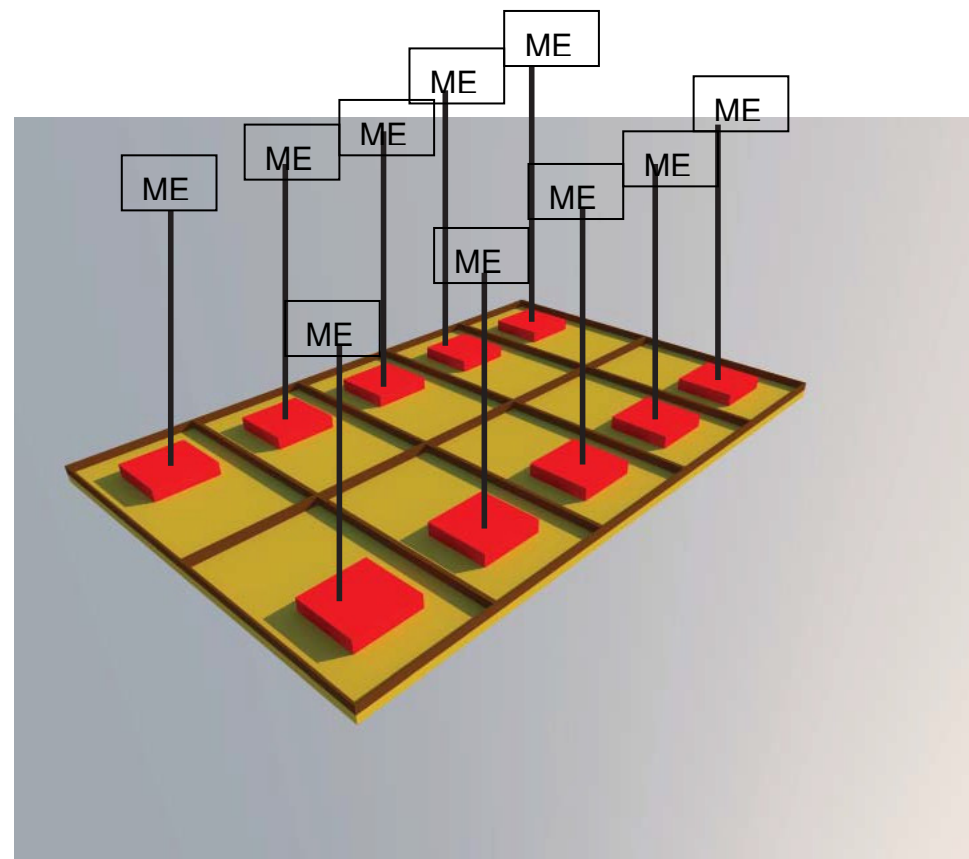


Fig. 94 Individual buildings should not be considered in isolation

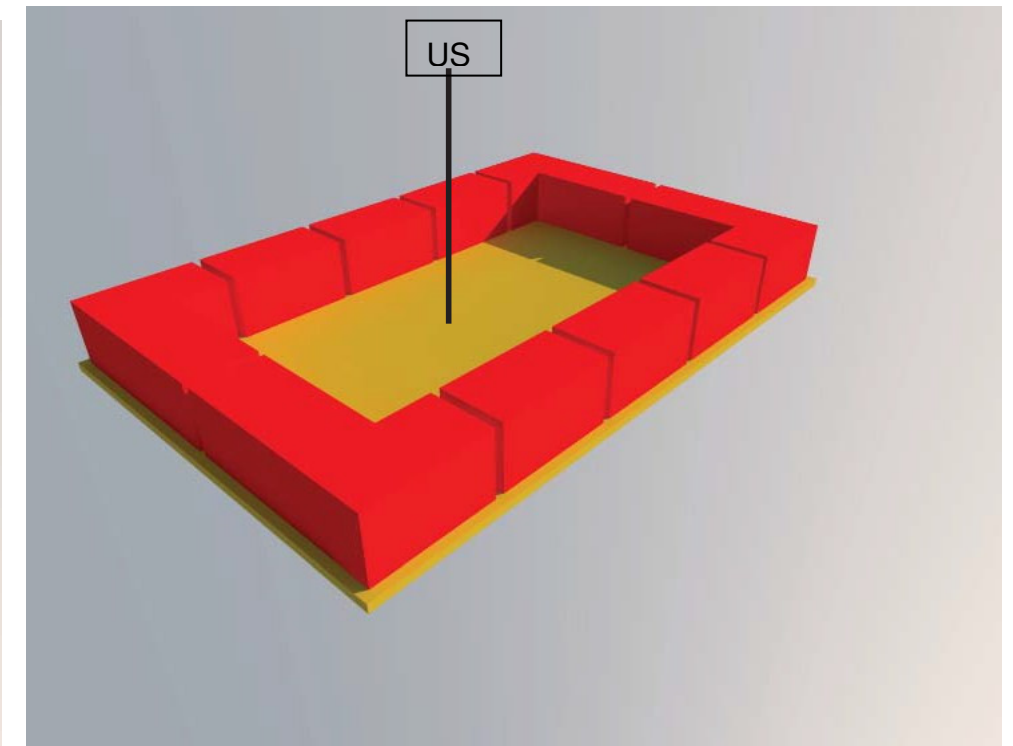


Fig. 95 They are part of a neighbourhood precinct

Understanding the Superblock

It is important that in the future each building once constructed forms part of a coherent whole with the other buildings within the study area. It may be that as a future project the Local Authority looks at design coding which can be provided for how individual buildings should be massed, how blocks should be massed and how at precinct scale each of these individual buildings will form part of a coherent whole.

The diagrams above should not be taken figuratively, but the essential concept is that individual buildings should be considered as part of a coherent whole. By clustering individual buildings together the micro-climate can be moderated.

ANNEXURE B - RECOMMENDATIONS FOR LONG-TERM ENVIRONMENTAL PLANNING

The purpose of this Chapter is to provide a guideline for the Town Council on what they should be aware of in terms of long-term planning and the management of environmental concerns in the Townlands of Oranjemund.

Subjecting the structure plan to a Strategic Environmental Assessment (SEA) process is not part of the scope of work for this project. However, as an SEA is now increasingly being required by the MET it is a recommendation that a SEA is carried out by the RTC in the future.

It should also be noted that whether or not an SEA is carried out, individual EIA's will still be required for any development that constitutes a listed activity.

It is intended that the Oranjemund Town Council uses subsequent sections of this Chapter to provide the foundation on which the Town Council can build its environmental policy and environmental management strategy.

Legal Requirements

It should be noted that the requirements stated in this section only highlight some of the duties of the Council to be met. It is recommended that a legal register be drafted for the Town Council so that they are fully aware of their duties and requirements. This register can then also be used as a tool to audit both the Town Council and the industries situated within the boundaries of Oranjemund and to ensure that all operations within the Townlands fall within the scope of environmental legislation.

Waste Management and Pollution

The following is based on the Draft Pollution Control and Waste Management Bill (2003) (10.1):

Air quality

- Duties to monitor air quality may be delegated to the Local Authority Council, in this case Oranjemund Town Council, if the necessary resources and expertise are available.
- Air quality action areas may be established where pollution clean-up is required.

Water quality

- Duties to monitor water quality may be delegated to the Local Authority Council, in this case Oranjemund Town Council, if the necessary resources and expertise are available.
- Water quality action areas may be established where pollution clean-up is required.

Waste management

The waste management process shall be dealt with in such a manner that waste does not become a significant risk to human health or the environment.

Each local authority shall be responsible for the development of a local waste management plan that should:

- Describe quantities and types of waste generated.
- Detail existing methods to manage waste including the identification of existing waste disposal sites.
- Analyse anticipated current and future needs for additional capacity and infrastructure.
- Objectives of waste management.
- Description of measures to achieve these objectives.

Local Authorities are required under the scope of this policy to:

- Take all practical measures to promote and support the minimisation of waste and recovery of waste. Particularly at the point of production.
- Provide litter receptacles in public places.
- Collect and dispose of household waste.
- Prepare and submit a local waste management plan.
- Report annually on the waste management plan.

Nuisance

The Local Authority must have systems in place to ensure the abatement of activities resulting in nuisance in terms of noise, dust and odour. Even though the Draft Pollution Control and Waste Management Bill (2003) has not yet become an official policy document of Namibia, it would be an advantage for the Town Council to move towards compliance with the requirements before any deadlines are established. This will ensure that the necessary requirements can be met, or compliance procedures be established, before any punishment for non-compliance comes into force.

Environmental Impact Assessments

The following are listed activities that require Environmental Impact Assessments, and the Town Council should not allow any of these activities unless the project proponent has received clearance from the Ministry of Environment and Tourism:

- Energy generation, transmission and storage activities.
- Waste management, treatment, handling and disposal activities.
- Mining and quarrying activities.
- Forestry activities (does not include town beautification initiatives unless full-scale afforestation is planned).
- Land-use development activities
- Tourism development activities
- Agriculture and Aquaculture activities
- Water resource developments.
- Hazardous substances treatment, handling and storage.
- Infrastructure developments.

More details with regards to these listed activities can be found in Government Gazette No 4878 dated 6 February 2012. (10.2)

It should be noted that the full EIA process may not be required for all activities, but that at least a scoping report will be required based on the process flow stated in the legislation.

It should be noted that any activity stated above, already in existence within the boundaries of Oranjemund, must apply for a clearance certificate and submit an EMP. Small scale, informal activities should be considered in general, and the assessment of the cumulative impact must be managed by the Town Council.

Strategic Environmental Assessments

According to the draft regulations for Strategic Environmental Assessments (SEA) (April, 2008) (10.3), all policies, plans and programmes should be assessed by means of an SEA process. This process should be undertaken during the development of the policy, plan or programme and before its adoption or submission to the legislative procedure. This process is, however, not required if only a small piece of land is affected at the local level.

It will be the responsibility of the Town Council to cover the costs related to this process. The process as detailed in the draft regulations should be adhered to.

Strategic Planning Requirements

Some issues to be addressed by the Oranjemund Town Council are not only of local concern but may affect the entire region. Dealing with these issues on a local level may in the short term alleviate the problem within the boundaries of the town, but may result in more issues over the long run for the entire region.

It is recommended that the following issues be considered as issues that should be discussed, planned for and managed on a regional level:

- The management and control of flood waters – initiatives implemented in isolation may result in unanticipated upstream or downstream impacts if such initiatives are only implemented on a local level and not considered on a regional level.
- Development and maintenance of infrastructure – if infrastructure is only developed and maintained within the boundaries of one town, the failure of other towns to follow suite may result in the wastage of the towns resources since the overall impression that investors will have of the region will be one of underdevelopment, even if the situation is different at a local level.
- Provision of services – if services are not equally distributed throughout the region, it may result in a situation whereby one town is burdened by people in need of services without the town benefiting from the presence of these individuals on a permanent basis.
- Climate change adaptation – the impacts of climate change will not only be experienced on a local level; it is

therefore necessary to plan for these impacts on a regional level. Some issues of concern with regards to this are highlighted later in this chapter.

- Land management – Sustainable approaches to farming should be encouraged to reduce any possible erosion in the quality of the soil over the long term, particularly in the context of an extended townlands area in which agricultural activities will still be practiced.

Any plan or policy developed on a regional level for any of the concerns stated overleaf should be subjected to a Strategic Environmental Assessment (SEA).

Community Learning and Participation

Even though a thorough public consultation process and scoping exercises were followed during the development of the Structure Plan, further participation from the community will be required if the Town Council wishes to ensure that the recommendations in the plan can be successfully implemented.

In some instances, the initiatives proposed will result in an alteration in the lifestyle of the community and these initiatives will therefore only be successful if the community buys into the proposed changes.

In other instances the active participation of the community will be required in order to make the initiative a success and they therefore need to be involved in, and educated about, the process from the beginning.

Community involvement is also essential to the success of this project as it will heighten the sense of ownership of any project that takes place, making environmental initiatives more likely to succeed in the long term. If work that does not require a high level of skill and training (such as some landscaping, brick making, etc.) is undertaken by the local community it will also mean that money spent on these projects will remain in the local economy, aiding economic growth.

Therefore, it is recommended that the Town Council creates a community education and discussion forum to ensure that people are aware of what is happening, why it is happening and what their rights and responsibilities are.

Such initiatives tend to be costly, and it is therefore recommended that the programme be designed with the aid of a qualified and experienced expert who should ensure that the

programme is appropriate for the local community and their cultural and community preferences.

Climate Change Adaptation

Namibia in general is vulnerable to the impacts of climate change. The extent of the anticipated impacts cannot be precisely defined due to a variety of factors, but all modelling scenarios indicate that Namibia will be negatively affected and that impacts may be severe. Therefore, it is important that all long-term policy or strategy documents be aware of the risk that changing climate poses to the people and development of the country, and should incorporate basic strategies to adapt to, and mitigate these risks.

The following risks should be kept in mind and strategies sought to avoid them or to adapt to them (from 'Information Packages and Targeted Awareness-raising and Training to Decision-makers and Practitioners on Climate Change Adaptation published by the MET as part of their Climate Change Adaptation Training)
<http://www.met.gov.na/AAP/TechnicalStudies/TrainingDecisionMakers/Pages/default.aspx>

Temperature – Projections show that the country is likely to get hotter with a greater number of days exceeding 35° each year.

Rainfall – Projections show the intensity of Rainfall will increase although the total amount of rain is likely to decrease. Rainy seasons may get shorter and the number of consecutive days of rain may decrease.

Changes in temperature and rain fall patterns may significantly impact agricultural output and thereby reducing grain production and reduced yields.

Vegetation is expected to suffer some reduction in net primary productivity, having a negative impact on browsing livestock such as cattle.

This may in turn lead to **longer-term food shortages**, poor nutrition and malnutrition with indirect negative impacts such as changes in soil quality, introduction of pests, and possible increases in water- borne diseases.

The MET has not produced a climate risk management plan for all of the individual regions of Namibia, but they have undertaken a pilot study for the Oshana region, and many of the risks identified in this report can be applied to other regions such as the Erongo Region.

The following risks represent an edited list of the risks identified in the Climate Risk Management Plan for the Oshana Region, DRFN, 2011) (10.4), this risks should be kept in mind by the Council and strategies sought to avoid them or to adapt to them;

- Flooding of settlements
- Damage to infrastructure
- Inadequate storm water drainage
- Improper planning for settlements
- Inadequate building standards
- Financial implications (costs to repair, insurance, etc.)
- Limited coordination and information exchange
- Sanitation and health
- Displacement of people
- Open pools of water
- Increase in temperature and resultant deaths due to heat exposure

The issues stated above relate only to those where climate change and the built environment will directly affect one another. There are many more issues at play such as impacts on agriculture and possible increases in disease related deaths due to a rise in opportunistic infections caused by changing climate. However, the issues stated in bullet point above can be dealt with on a local level and should be taken into consideration when planning for development in the Oranjemund

Red Flagged Initiatives

The Town Council must carefully consider activities that may impact on air or water quality. The legislation is being developed to force the Council to actively monitor, manage and control air and water pollution. Therefore, the precautionary principle would mean that activities likely to have such impacts should be closely scrutinised and managed once implemented.

No industry should be allowed to drain or pump water into the sewer system unless a permit has been issued to allow this activity. In these instances activities should be closely monitored and audited at least once a year against the stipulations of the permits and the requirements of the mandatory Environmental Management Plan.

Generally, the Town Council is discouraged from allowing any entity or business to import general or hazardous waste and dispose of such waste within the town boundaries.

Monitoring and Management

It is recommended that the Town Council identifies key capacity gaps and moves towards the development of individuals to fill those gaps in order to ensure that the right personnel are available to do the necessary monitoring when required in order to determine whether or not pollution levels are within acceptable levels.

It is also recommended that the Town Council identifies the most significant environmental issues currently being experienced in the Town and to develop an Action Plan to deal with these issues. This will ensure that Oranjemund can move towards being a sustainable town, it will allow for improved planning and ensure that the necessary resources are available to deal with possible threats and opportunities.

The main issues to be evaluated and prioritised by the Town Council include:

- Natural resource management
- Infrastructure development – identification and maintenance of corridors
- Animal management
- Community education and awareness
- Land management
- Waste management
- Quarrying
- Climate change

Having an environmental policy and plan in place for the town will be a great benefit in the long run. Most importantly, it will provide investors with a framework for development.

Chapter findings

A high-level SEA should be carried out against the Structure Plan in the future as the assessment does not form part of the scope of this report.

A legal register should be drafted making the Council aware of their duties under the environmental legislation.

The Council has duties regarding air quality, water quality, waste management and nuisance control.

Oranjemund Town Council is responsible for the development of a waste management plan.

Listed activities taking place in Oranjemund require clearance from the Ministry of Environment and Tourism.

Existing listed activities must submit an Environmental Management Plan (EMP)

Issues such as control of floodwaters, maintenance of infrastructure, provision of services, climate change adaptation and land management should be considered at the regional level as well as at the local level.

In the event of an increase in the townlands area, some areas falling under the townlands jurisdiction will be used for agricultural activities. In these areas the Council should encourage sustainable farming practices and soil management.

The Council should create a community education and discussion forum.

Oranjemund Town Council should develop an integrated Waste Management Plan.

Oranjemund Town Council should develop basic strategies to adapt to and mitigate climate change over the long term.

No industry should be allowed to drain or pump water into the sewer without a permit.

The Oranjemund Town Council should identify capacity gaps and train individuals within their staff to fill these capacity gaps.

ANNEXURE C: SUSTAINABLE BUILDINGS TECHNOLOGY

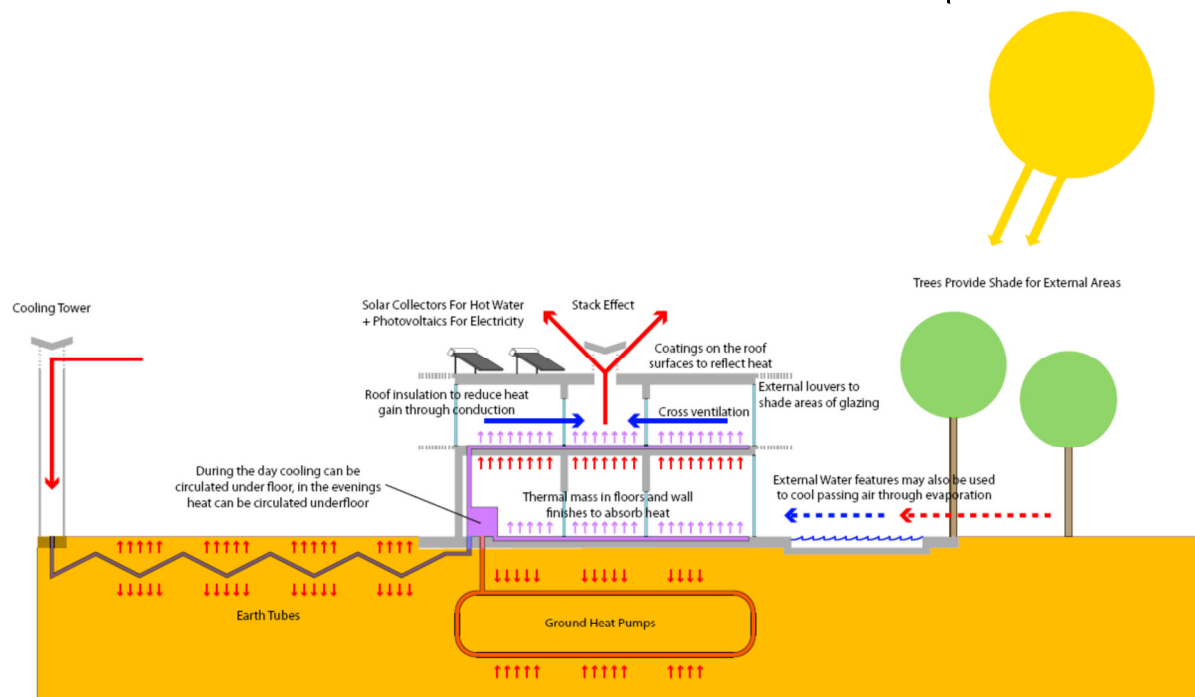


Figure 18: Sustainable Building Technologies

Using sustainable building technology is only one aspect of sustainability and should not be considered in isolation to other sustainable approaches to Planning and Urban Design on the whole. However, the purpose of this chapter is to inform the Council of some of the technologies that are available that can increase energy saving within the context of building construction.

In Namibia the current national standards are being developed, and a lot of thought is going into the development of localized sustainability codes for buildings. At the present time though these codes are still being developed and as with all building codes in Namibia, when a local authority has not developed their own, the South African Building standards are applied.

With regard to sustainability the applicable building control code is: SANS 10400-XA:2011 – ‘South African National Standard (SANS) The application of the National Building Regulations Part X: Environmental sustainability & Part XA: Energy usage in buildings’.

Notwithstanding the guidance set out in the code the following advice has been assembled as a guide to the Council when considering sustainable buildings technology.

When new residential buildings and neighbourhoods are designed within Oranjemund, observation of best practice in environmental sustainability should be encouraged. The abundance of sunlight within Namibia creates both constraints and opportunities when considering individual building designs. A range of measures can be employed by the building designer to mitigate or exploit environmental conditions, and the cost of these measures can range from being relatively cheap to expensive, and in many cases provision needs to be made by the builder or developer of increased capital costs versus lower operational costs to ensure that the design solution remains economically feasible and deliverable.

The Council should try to balance the promotion of sustainable principals in design with possible additional construction costs which may discourage development. Energy efficiency in terms of building design should

also be considered in order to lessen the burden on power producers, distributors and suppliers in terms of domestic demand, which can result in more electricity capacity being available for industrial demand, or even an overall net energy saving. Design criteria should also be cognizant of the impact of climate change, and possible effects of flooding in the future.

Sunlight

Solar gains need to be mitigated through intelligent building design so that an acceptable internal ambient temperature can be achieved without the need for excessive use of electricity, water and fossil fuels, as is the case with traditional mechanical / electrical air conditioning systems.

Passive mitigation measures can include coatings on roof surfaces to reflect heat, roof insulation to reduce heat gained through conduction, increased levels of thermal mass in floors and wall finishes to absorb heat during the day (and releasing it in the evening), external louvers / climber plants to shade areas of glazing, openings on each side of the buildings with an appropriate floor-to-wall ratio to promote cross ventilation,

and high level openings / pitched roofs / cowls to promote a stack effect, for passive cooling.

Cooling

External water features may also be used to cool passing air through evaporation, but analysis will need to be done on the effectiveness of this in an areas of such high levels of evaporation, and where disease carrying insects may be prevalent. Active mitigation measures can include Cooling Towers (passing warm air drawn through evaporating water and distributed through stack effect) and Earth Tubes (cooling of air by drawing it though pipes in the ground during the day). But these active mitigation measures require a level of knowledge from the building designer that may not always be available.

As well as mitigating the effects of sunlight, sunlight energy can be harvested as a source for hot water through the use of solar collectors, for the generation of electricity through the use of Photovoltaics, and as a source of ventilation through ‘Solar Cooling’.

Solar Cooling is the use of a variety of techniques to convert sunlight energy into cooling, i.e. using photovoltaic-gained electricity to pump air around a building that has been passed over a desiccant to extract moisture. Solar Cooling is one of the most technologically complex environmentally-friendly solutions, but it has been done, and designers of larger more complex buildings with larger budgets should be encouraged to explore this technology if desirable conditions cannot be reached with passive measures alone.

Heating

When internal heating is required, this can be provided either through the slow release of heat stored in the building’s thermal mass as it cools down in the evening, or through the use of ground heat pumps, providing, for instance, under-floor heating.

It may be that on analysis, the design criteria may not be met economically with any of the above techniques. In this case, a mixed approach should be promoted in which at certain times of the year / or times of the day more conventional approaches to heating and cooling strategies are employed. The buildings will be operated in what is referred to by building designers as ‘mixed mode’.

Embodied Carbon and Water

In addition to building performance, criteria such as the environmental cost of the buildings materials and construction should be considered, particularly embodied carbon, (through materials and transport of materials), embodied water through materials (wet and dry) and the reusability of the buildings materials when the building comes to the end of its lifecycle.

Assessment Tools

For a comprehensive assessment of the sustainability credentials of a building, the Local Authority may wish to request developers to self-assess their building by using an environmental assessment tool. Unfortunately, an environmental assessment tool has not been developed for Namibia, which means that developers wishing to self-assess their building will need to use one of the globally recognised standards to assess the sustainability of buildings. In the English language, the most commonly used international standards and performance evaluation mechanisms are:

- LEED NC (buildings scale) - This is a tool developed by the US Green Building Council
- BREEAM (buildings scale) - This is similar to a tool that has been developed in the UK.
- GREEN STAR – This is a similar tool developed in Australia and also being used in South Africa.

It should be noted that the use of these self-assessment tools do require a qualified assessor, and that acquiring such a person will have a cost implication, therefore the Town Council should consider the costs of this when approaching developers.

Non-Residential Buildings

As user population density is anticipated to be higher in non-residential buildings than in residential buildings, it is considered that natural ventilation may be the most significant consideration for the building designer. Ventilation can be achieved naturally through openings on each side of the buildings and a considered floor-to-wall ratio to promote cross ventilation.

Reference Guides

A short publication 'Guidelines for Building in an Energy Efficient Manner' (13.1), published by REEEI and the Habitat Research & Development Centre in Windhoek, provides guidelines on how to incorporate energy efficiency and

renewable energy technologies and principles into housing designs.

Chapter Findings

Future building developers should be encouraged to incorporate sustainable principals, and a brief overview of sustainable building technologies have been described in this chapter.

Building designs should minimise the use of mechanical / electrical cooling if possible.

Heating, where needed, could be provided through ground source heat pumps, thermal mass or through solar gain.

If, for a variety of technical, financial and human capacity reasons a best practice solution cannot be introduced, the developer should use a mixture of techniques to achieve the desired outcome, operating buildings in what is known as mixed-mode.

The embodied carbon and water within building materials should be considered, as should the embodied carbon and water within the construction process.

Developers can be requested to self-assess their buildings, however a specific assessment tool is currently not available specifically for Namibian, and therefore reference should be made to internationally recognised sustainability tools, and these are listed.

ANNEXURE D: INTERNATIONAL TRENDS IN URBAN PLANNING

The UN Habitat recently released a report on “International guidelines and territorial planning – Towards a compendium of Inspiring Practises” that looks at 26 international experiences in urban and territorial planning with a cross section of inventive, ambitious and unique cases that address common issues of urban and territorial development and highlights successful examples of how urban planning can reshape areas. There are five key lessons that were reflected from the wider case studies in the report:

- a) Integrated policy formulation and implementation
- b) Transformative renewal strategies
- c) Environmental planning and management
- d) Planning compact and connected cities and regions
- e) Inclusive and participatory planning

The international trend within urban planning has been for the past years to focus on the following main trends:

Placemaking and greening cities

Placemaking refers to creating public places that uplift and help people connect with each other; it is the re-invention of public spaces for people to enjoy. It not only refers to public open spaces, but also to streets and neighbourhoods. Turning former derelict areas into areas where people want to be.

Greening cities does not necessarily mean planting large amounts of trees, flowers and grass that are high on water consumption. Namibia, being an arid country, needs to also look at alternative “green” parks that uses less water as well as utilising filtered grey water for parks. Hard landscaping with a few trees or desert plants can also make a difference to an area such as the small park in the town of Oranjemund that mostly uses desert plants for greening (Figure 19).

The Figure 8 shows the transformation of dreary double lane road into a street café by simple utilising the island in the middle of the road for a social space.

Figure 9 shows the well-known highline in New York, USA, where the former railway line was transformed from a derelict area to a vibrant open space system (Figure 9)

Figure 19 Park in the town of Oranjemund



Figure 20: Transforming a main road into a social arena in Chicago,USA



Source: David Broz (Gensler, 2015)

Figure 21: Minimalistic green



Figure 22: Streetscape in arid areas



Figure 23 Desert parks



Figure 24: Minimum trees - playing with design



York - before

Figure 25: Highline New



Figure 26: Highline New York - after



Figure 10 and 11 illustrates further the importance of simple ideas and how these ideas can transform monotonous residential areas into proper neighbourhoods.

Figure 27: Monotonous residential area



Figure 28 Transformed residential area



Windhoek



Figure 29 Paving, trees and shade structures

The southern end of Independence Avenue features shopfronts and offices facing directly onto the street. The walkway is fully paved with shade provided by awnings and overhangs from buildings and trees planted to separate the vehicular and pedestrian traffic.

- Note that pedestrians are naturally walking along the cooler shadier areas of the street.
- Note that the paving exists as one continuous surface, without breaks for drainage infrastructure



Figure 30: Tree planting and landscaping for beautification

The quality of public open space in the Windhoek town centre is enhanced with tree planting and landscaping.

Typically it is recommended that tree or shrub species chosen in Oranjemund are those that are native to the area.



Figure 31 Tree planting and landscaping for amenities

Street lighting is provided for pedestrians as well as vehicles. Bollards are provided around road crossings to prevent vehicles turning into areas reserved for pedestrians. Bins are provided for refuse.

It is recommended that the advice of a horticulturist is sought for planning any tree planting program, but in broad terms trees in the Acacia group appear throughout the region and this may be a good starting point when researching the appropriate trees for a large scale planting programme.

Windhoek



Figure 32 Street furniture providing vehicle and pedestrian buffer

Care needs to be taken when developing street furniture along the road edge that could be used by hawkers and illegal traders to trade and interact with passing traffic along the roadside. Creating a nuisance and endangering safety.

Here street furniture is used to create a buffer between the vehicular and pedestrian traffic. Seating is oriented towards the pavement side of the street, away from traffic.



Figure 33 Landscaping providing shape for street furniture

Landscaping can be used to provide shade for these areas through the planting of trees and shrubs.

- Note care needs to be taken in terms of orientation so that shade is provided for seating during the times of day that most activity is likely to take place within a given area.

Swakopmund



Figure 34 Human scale – short distances between buildings

Note the intimacy and human scale of this small square in Swakopmund. The closeness of the buildings provides protection from the elements, and the ability to circulate easily as pedestrians.

- **Note** that spaces between buildings are often determined by fire safety requirements, and that design will need to consider fire safety carefully when building more densely.



Figure 35 Different treatments of the north & south side of the street

This photograph demonstrates how the north and south of the street are treated differently as a result of sunlight orientation. The northern side of the street create shade naturally as the sun is behind it for much of the day. The southern side of the street provides roof overhangs to provide shade.

- **Note** this street is semi pedestrianised and retains its human scale.

Swakopmund



Figure 36 *Trees dividing road lanes for beautification*

Trees Dividing Road Lanes for Beautification

Tree planting is used to beautify the roadway.

Note that it is recommended that Oranjemund uses native trees/ shrubs



Figure 37 *Trees lining pedestrian routes to provide shade*

Tree planting on both sides of this pedestrian route provide a cool, shaded route towards the waterfront, making the journey pleasant even on a particularly hot day.



Figure 38 *street furniture providing place to rest*

Benches and trees provide a public amenity along this promenade.

Note the landscape buffer between the area of seating and other forms of activity.



Figure 39 *Pedestrian only parkways provide amenity*

This pedestrian link between the beach and the town centre is surrounded by trees providing shade and provides picnic benches and tables for public use.

Note: care needs to be taken to ensure clear site lines for pedestrians as too much shade and the absence of clear site lines can make criminal activities easier and more likely.

Swakopmund



Figure 40 Pedestrian only arcades leading to enclosed squares

Off street business activities can be linked back into the main activity spines via pedestrian only arcades.

This allows intensification of business activities in the form of more shop frontage space without the need to extend the activity spine outwards or upwards.

- Note care needs to be taken not to introduce too great an increase in pedestrian footfall without having adequate street side pavement width, thus avoiding unmanageable congestion points.
- Despite the promotion of walking and pedestrian activities in Swakopmund ,the popularity of the town has resulted in large numbers of cars entering the town and has resulted in a greater need for car parking. When Oranjemund considers pedestrianisation of retail areas, provision of additional car parking will need to be provided.



Figure 41 Squares provide shade, furniture and retail outlets

Off street enclosed squares provide shade, furniture and retail outlets.

By keeping these squares relatively small in relation to the height of surrounding buildings, the surrounding buildings themselves can create shade, which can be further enhanced with shade structures and street furniture.



Figure 42 paving design reflects coastal city identity

Paving design reflecting coastal towns identity. As a coastal city Swakopmund further promotes its identity by referencing water in its pavement design.



Figure 43 SCULPTURAL elements enhance maritime identity

Landscape sculpture can be used to further reiterate the identity of the town.

Otjiwarongo



Figure 44: Older buildings with Shade structures

These older buildings in Oranjemund provide very simple shade devices, which could be provided retrospectively for older buildings.



Figure 45: Newer buildings with shade structures

The local authority should encourage developers to incorporate shade structures into their designs, particularly along major pedestrian corridors, and particularly with regard to buildings used by the public.

This newer building has a simple shade structure built onto it. As this shop is north facing the shade structure provides shade for customers outside of the shop and mitigates the solar gains entering through the large windows.



Figure 46 Trees provide shading and beautification

Even in places where buildings are set back from the roadsides, for instance in the case of residential areas, trees or shade structure can be used to provide shade and for beautification.



Figure 47 once planted trees need to be maintained

As well as selecting the most appropriate trees for each locating, there is also a requirement to maintain them.

Urban intensification and densification

Urban intensification is a process where new buildings are built at higher densities, vacant land in urban areas is developed and high density re-development takes place. It is also associated with the increase in amount of activities – therefore both an increase in population density and the extent of economic and social activity.

Densification does not mean poor urban quality and overcrowding and this is not the purpose of densification. The purpose of densification is to ensure higher numbers of people in an area which can then support urban services such as public transport, shops and schools. Research has shown that 100 people per hectare can support a bus service. Taking a typical block of residential erven in Oranjemund measuring 1 hectare will have typically 12 erven. Taking the average household of 3.5 people per household this means that typically in Oranjemund such a 1 hectare area only holds a population of about 45 people. If however, the density was changed to allow for duplex units on these 12 properties, it will already increase the density to 84 people, by simple allowing duplex flats.

By simple intensifying the activities and use within the town, the town can become more compact. Densification in the Namibian context does not necessarily mean a Dubai or Shanghai high-rise type development. Densification in smaller towns such as Oranjemund, can mean

- Intensifying the business centre (allowing for higher buildings – 3 or 4 storey buildings) with shops at the bottom; offices on the first floor and residential units on the second floor.
- Densifying policy areas within town with buildings such as duplex flats, townhouses and apartments (2 storey buildings)
- Densifying areas within town by simple subdividing larger erven into an additional property (2 storey buildings).

Integrating natural and historical environments into planning

Recent international trends in urban planning have been to start recognising the importance of the environment within a town. Integrated the environment into urban planning can makes cities and towns liveable. One of the key

elements of making a city liveable is to provide also for the environmental element within the city or town. Taking the environment into account also means undertaking sustainable development and not venturing into sensitive habitats or productive agricultural land. One such an example is the Avis Dam Reserve in Windhoek which is a large area being leased by a group of concerned citizens. The reserve is open for public enjoyment, hiking, fishing and cycling.

Figure 48 Avis Dam - incorporating nature into the city



Incorporating the history of an area and historical buildings and sites into planning is also a trend in sustainable development. By incorporating historical sites and buildings it also lends a certain character to the town upon which spin-off benefits such as tourism can be attached.

The strong tourism in towns such as Swakopmund and Lüderitz thrive on the historical background of the town. The historical background and preservation of the buildings in these towns attracts tourist.

Figure 49: Historical buildings in Swakopmund



Source: <http://knownamibia.com/locations/swakopmund>

Incorporating historical landmark features into the fabric of the city contributes to the character of a town/city such as the Christus Kirche in Windhoek that has become a famous stop-over for visitors to the city.

Figure 50: Christus Kirche, Windhoek



Source: www.alchetron.com

Some additional international concepts:

- To attract people to an area the area must be safe, comfortable, varied and attractive to encourage people to use the area.
- Avoid planning secondary business nodes in smaller towns and rather support the existing business arena with integrating new business developments
- Create transition areas between the commercial core and the residential areas. Within these transition areas mixed use activities such as shops, offices, warehouses, artists and cultural quarters, restaurants and schools.

Creation of Pedestrian and cycle friendly streets

Thinking about pedestrian and cycle-friendly streets, here are a few questions for local authorities to ask when designing such areas:

- Does the route connect the places where the people want to go?
- Are routes direct, and are crossings easy to use? Do pedestrians have to wait more than 10 seconds to cross roads?

- Are routes attractive and safe?
- What is the quality and width of the footway and what obstructions are there?
- How easy is it to find and follow a route? (Llewelyn; Davies; Yeang)

Creation of mixed use high streets

As part of the design of the town it is also important to look at the urban structure. A liveable and sustainable urban structure needs to look at the creation of:

- Movement networks
- Walkable neighbourhood
- Street network
- High street/ activity corridors
- Densities

Figure 51 Typical High Street



Regent Street in London is a typical high street where a mixture of intensified activities have been developed. At the ground floor will be the shops; first floor offices and second and third floor accommodation. These activities ensure that the street always have people whether it is day or night.

Conclusion

Generally cities and towns worldwide are becoming more focused on creating sustainable cities. A sustainable cities does not only refer to environmental sustainability, but also at the urban environment,

- creating a walkable city,
- creating recreational spaces,
- creating economic growth through provision of investment opportunities,
- cycling lane
- bus routes
- densification
- curbing urban sprawl

These terminologies are important planning concepts that local authority needs to implement.

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