5. SPATIAL DEVELOPMENT CONCEPT

The Spatial Development Concept will integrate the spatial planning directives of the previous section of this document into a strategic spatial vision for the city. The Spatial Development Concept is structured around the following building blocks, which are interrelated:

- Nodes and Activity Areas
- Movement and Connectivity
- Environmental Structuring Concept

5.1 NODES AND ACTIVITY AREAS

Nodes or ‘nodal areas’ are activity areas that have been identified for focused economic development and growth, with a view to rationalizing available resources.

The benefits of concentrated Activity Areas at a metropolitan level as a structuring mechanism include the support of a viable public transport system, the concentration and intensification of various activities (diversity) at appropriate locations that are highly accessible, economies of scale creating opportunities, and the management of these areas to address degradation and ‘leakage’ of development pressure. Residential densification, around these activity areas is one of the strategies to ensure the viability of these areas and promote a public transport system.

5.1.1 HIERARCHY OF NODES

Understanding that the current needs far outweigh the resources, it is important that the City focuses on the opportunities that exist for exponential growth and investment in the long term. These opportunities will be determined within the spatial vision by indicating where growth will occur in transport, housing, energy, water, recreation, education, health infrastructure and services, as explained by the smart growth concept. The spatial plan will promote efficient and effective resource allocation ensuring that resources such as infrastructure are delivered in the right place and at the right time. The spatial plan also provides a sense of certainty for the future and thus investor’s confidence.

From the city profile presented in Chapter 1, it is clear that the City of Tshwane holds a number of spatial opportunities. The city must operate within the context of the greater Gauteng City Region so that it can position itself to be competitive relative to the other major nodes within the province. This means that nodes within Tshwane should serve a specific function either within the local, provincial or national context. Various nodes can complement others of be functionally independent. The key issue is that nodes within the city do not compete but complement and support each other so that the synergies between them maximize the potential of the city as a whole. The diversification of various nodes will allow resilience and adaptability by maximizing all spatial opportunities, in
turn maximizing economic growth opportunities through strategic investment decisions.

An important distinction is made between four nodal typologies:

- Capital Core
- Metropolitan nodes
- Urban Cores
- Emerging Nodes

**Capital Core**- the Tshwane Inner city is identified as the Capital Core as it is the city’s first order node amongst all metropolitan nodes. Traditionally, the inner city is also the Central Business District (CBD) of major cities. Tshwane is no different.

Historically, the inner city was the geographic heart and centre of what is now the Tshwane area. Over time, though, due to the extension of the Tshwane boundaries, the Inner City is no longer geographically central, but still plays a very important role with regards to the concentration of retail, office and government buildings to be found in the area.

The Capital Core must:

- Be the focal point for housing government departments
- Be developed to a higher than average density, supporting all principles of smart growth

**Metropolitan Nodes**- these are primary nodes of the highest order. These nodes accommodate the highest degree of service specialisation and offer the widest range of services. Often, metropolitan nodes will have regional/provincial relevance. In the Tshwane context, Metropolitan nodes are those nodes within the City (economically) benefiting primarily from the investment of the private sector. Equally important is that these nodes serve as economic hubs and focal points for employment opportunities. The role of the public sector in such nodes is to manage the rate of growth, provide infrastructure in line with the growth management plan and maintain the urban environment. Such localities are also where the most extensive land use rights, including densities, are likely to be supported, in line with the growth management strategy.

**Urban Cores**- former township areas were developed as a result of forced relocation programmes. Inevitably, these townships grew to accommodate large populations of low income or unemployed people. The economic circumstance was clearly evident in the quality of the physical environment. Under the new government which was established in 1994, these township areas were identified, not as a blight in the urban fabric as previously thought of, but as beacons of opportunity, through the human capital that was concentrated within the various communities of the townships. Due to the great need that often belies such nodes, the government has to play a more active role in social and economic restructuring, especially in view of the limited private investment, relative to Metropolitan cores. The Neighbourhood Development Programme
(NDPG) is a nationally funded programme that aims to address the improved quality of environment in urban cores.

**Emerging nodes** - over the past few years, certain economic, social and/or residential opportunities have begun to emerge in various localities in the city. The realisation of these localities into fully fledged nodes will depend on a number of factors. While the future of these nodes is uncertain, the potential for greater development is clear. Identifying future urban areas also provides an opportunity to plan for the provision of new infrastructure and timely planning for growth that is sustainable. Emerging nodes will be managed subject to growth management principles.
TSHWANE METROPOLITAN SPATIAL DEVELOPMENT FRAMEWORK 2012

DIAGRAM 12: Tshwane Nodes
5.1.2 SPECIALISED ACTIVITY AREAS

There are nodes within the metropolitan area that are characterised by largely mono-functional land uses taking up large, concentrated and defined space. The character of the areas ranges from industrial to high technology smart industries, medical facilities, educational and research facilities. It is important to acknowledge these specialised activity areas not just in terms of their scale, but because of their sphere of influence in terms of generating movement, opportunities and linkages with other areas. These linkages do not only refer to physical linkages, but also to “connectivity” in a broader sense, such as between institutions of learning and research.

Specialised Activity Areas include such areas as:

- Industrial Estates
- Research, Innovation, Education and Technology Institutes
- Airports
- Tourism nodes

Within Tshwane, we find all of the above-mentioned specialised areas (See Diagrams 13 and 14)

The Blue IQ initiative of the Gauteng Provincial government contribute significantly towards the specialised activity areas in Tshwane. Blue IQ aims to deliver strategic economic infrastructure to catalyse sustainable economic growth and to indirectly contribute to job creation; to influence the composition of exports, and influence the diversification of Gauteng’s GGP. The Blue IQ initiative focuses on four growth areas:

- Business Tourism
- High value-added Manufacturing (high value-add)
- Logistics
- Information and Communication Technology (ICT)

The Rosslyn Automotive Cluster (Industrial Estate), Innovation Hub (Research, Innovation and Technology) and Dinokeng Nature Reserve (Tourism node) are Blue IQ projects that have been established within Tshwane

(www.blueiq.co.za)
DIAGRAM 13: Industrial Estates
DIAGRAM 14: Specialised Activity Areas
As explained in Chapter 3, there is a hierarchy of spatial plans within Tshwane. The MSDF is supported by 7 Regional Spatial Frameworks, which are, in turn, supported by a number of Local Spatial Development Frameworks. The detail of the nodes that have been indicated above, are discussed in further detail within the RSDFs and LSDFs, indicating details such as the relative size, intensity and intended land uses, typologies and spatial character within the different nodes.

5.1.3 WHAT DOES A NODE LOOK LIKE?

A nodal area, being a concentration of landuse and activity, should visually present itself to be different from non-nodal areas. Chapter 4 of this document begins to illustrate what a node should look like:

- Densified
- Compact
- Intense land use
- High quality of street- and landscaping
- Pedestrian-friendly
- Aesthetically pleasing built-environment

Further, a node must be:

- **Accessible** with regards to providing ease with which a location can be accessed, using amongst others:
  - Well-structured paths for both vehicular and pedestrian access
  - Integration of the local road network system with the pedestrian movement system
  - Prioritisation pedestrian movement by providing direct, safe and convenient routes
  - An efficient and effective public transport service

- **Legible** by ensuring ease with which people can understand the layout of a place, using, amongst others:
  - Landmarks that provide orientation cues
  - Signage that assists with way-finding

- **Distinct** in that the nodal function is clear through quality and intensity of environment and applying place-making principles (uniqueness of a specific location) where applicable by using,
for example, piazzas, urban parks and monuments, for example

Nodal areas are usually beacons within successful cities. Several successful cities that Tshwane aims to emulate (New York, Paris, Shanghai, London, Curitiba) are also home to some of the world’s most recognisable skyscrapers and awe-inspiring skylines. Apart from being problem solvers for space related challenges, skyscrapers are also a visual manifestation of a concentration of money and power. Skyscrapers tell a story about the level of development within a city, technical and/or technological prowess, creating a positive city image, and encouraging interest from possible visitors, whether based on perception or fact.

While no city is perfect, and every city has an area or areas it would rather hide, one finds that successful cities, more often than not, are consistent in their quality of the built environment, incorporating most, if not all spatial directives as discussed in Chapter 4 of this document. Highlights in such cities are many, lowlights are few. While Tshwane’s Inner City skyline is something to be marvelled at from a distance, it is not yet comparable to other successful cities and one will find, on closer inspection, that all may not be as pleasant as things appear. In the Tshwane Inner City, for example, one will find both lowlights and highlights. But the highlights are exactly that-highlights...exceptional. The nodal areas of the future city of Tshwane should be consistent throughout in their level of quality of the built environment. The nodes of the future City of Tshwane can begin to look like these successful cities, with a focussed commitment to a spatial strategy that supports all aspects of nodal development, supported by sound spatial planning principles.
DIAGRAM 15: Skyscraper Cities
5.2 MOVEMENT AND CONNECTIVITY

Movement and Connectivity encompasses all aspects of transport, including non-motorised transport. Transport is important because it affects:

- **Spatial Form**
  The goal is to define a spatial structure based on the nodal development (densification and intensification at strategic points) approach which is supported by public transport. An efficient spatial form will address matters of spatial restructuring and socio-economic equality.

- **Environmental Impact**
  Transport systems are large consumers of space. The goal is to reduce the uptake of Greenfield sites through public transport and transit-oriented development.

- **Economic Development**
  Mobility is one of the most fundamental and important characteristics of economic activity as it satisfies the basic need of going from one location to the other, a need shared by passengers, freight and information. All economies and regions do not share the same level of mobility as most are in a different stage in their mobility transition. Economies that possess greater mobility are often those with better opportunities to develop than those suffering from scarce mobility. Reduced mobility impedes development while greater mobility is a catalyst for development. Mobility is thus a reliable indicator of development.

- **Social Equity**
  Goal is to reduce the economic impact of travel on communities that are far removed from work opportunities relative to residential location. The Mobility Gap between different populations can have substantial impacts on opportunities available to individuals.

The NDP vision for transport is that by 2030, investments in the transport sector will ensure that it serves as a key driver in empowering South Africa and its people, enabling:

- Improved access to economic opportunities, social spaces and services by bridging geographic distances affordably, reliably and safely.
- Economic development, by supporting the movement of goods from points of production to where they are consumed, facilitating regional and international trade.
- Greater mobility of people and goods through transport alternatives that support minimised environmental harm.

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1 Rodrigue J, 2009.
The City’s movement system comprises of three of the four forms of transportation i.e. Rail, Road and Air, excluding Maritime transport. The manner in which all three of these transport means are developed, managed, maintained and integrated will largely determine the success of the nodal concept. The sustainability of the nodal concept is dependent on connectivity and ease of access from one node to the other. The success of all focussed spatial interventions relies on the adequacy of that spatial form to meet the needs of all users. As efficient as a node may be within itself, the node will not be sustainable if the target users cannot access it. The regional profiles indicate clearly that Tshwane accommodates quite a number of nodes, some performing very different functions, while others are quite similar. The synergies that exist between the various nodes are what enable many of them to be sustainable. But those synergies cannot exist without efficient linkages between the nodes. Connectivity via the movement system effectively strings the city together, making it ‘smaller’ and providing equal access for all residents to all nodes, integrating labour markets and providing flexibility around options for residential location versus one’s place of work.

The movement system in an urban environment is literally the arteries of the city – without these linkages there can be no economy, no inter-relatedness, and no “life”. Movement systems can be used to create access, structure settlements, and promote integration, diversity and mixed land use. Movement (flows of people, finance, goods) defines the energy networks of settlements. Accordingly, more continuous lines of movement represent planes of greater accessibility and, therefore, become the more desirable planes of connection for intensive use. Significantly, the energy potential contained in lines of movement is released through stopping, not through movement. Different movement modes have different patterns of stopping.

While Tshwane has a comprehensive system of higher order mobility routes and development corridors, there are still several localities that are not adequately catered for. Integrated transport planning within Tshwane includes not only the planning side of things, but also inter-governmental relations. Some of the localities referred to above fall under provincial or national control and not under the local authority. Thus, co-operative planning will remain pertinent to the process required to address such areas.
5.2.1 ROADS

5.2.1.1 HIERARCHY OF ROADS

The hierarchy of roads categorizes roads according to their functions and capacities. The basic hierarchy comprises freeways, arterials, collectors, and local roads. The related concept of access management aims to provide access to land development, while ensuring traffic flows freely and safely on surrounding roads.

Freeways/ Highways

At the top of the hierarchy are limited access roads, freeways, highways or motorways, including most toll roads. These roads provide largely uninterrupted travel, often using partial or full access control, and are designed for high speeds. Some freeways have collector/distributor lanes (also known as local lanes) which further reduce the number of access ramps that directly interface with the freeway; rather, the freeway periodically interfaces with these parallel roadways, which themselves have multiple on and off-ramps. These allow the freeway to operate with less friction at an even higher speed and with higher flow. Often freeways are included in the next category, arterials. No direct access is given to developments. Nonetheless, the high visibility and exposure given by these highways increases the potential for creating development corridors, where large scale industrial; commercial and office developments can be located. Examples of these are the N1 and R21.

Major Arterial/ Mobility Spine

These are major through roads that are expected to carry large volumes of traffic. In some places there are large divided roads with few or no driveways that cannot be called freeways because they have occasional at-grade intersections with traffic lights that stop traffic or they are just too short. Such roads are usually classified as arterials. These roads serve the purpose of inter-regional and metropolitan movement. As with highways, these roads often serve
as good development corridors for large industrial, commercial and office developments due to the visual exposure offered to such developments. An example is the R101/ Old Johannesburg Road in Region 4.

**Minor Arterial/ Mobility Street**

Serve intra-metropolitan movement and are the most important linkages between the City’s nodes. Pockets of mixed use developments where occasional access is given can be found. Where these roads cut through a node, transit-oriented development should be provided for along these roads. Examples are Francis Baard Street (formerly Schoeman Street) and Nelson Mandela Drive in the Inner City.

**Collectors/ Activity Spine**

These roads collect traffic from local roads, and distribute it to arterials. Traffic using a collector is usually going to or coming from somewhere nearby. These streets are characterized by slower moving traffic due to the nature of activity, often high density mixed use development, along the street. Direct and high accessibility to land uses is provided. Transit-oriented development should be provided for along these roads. Examples are Burnett and Park Streets in Hatfield.

**Local roads/ Activity Street**

At the bottom of the hierarchy are local streets and roads. These roads have the lowest speed limit, and carry low volumes of traffic. In some areas, mostly to be found just adjacent to collectors and in residential areas. Examples are Pimento and Corobay Streets in the Menlyn area.

Movement in terms of the road network relates to two metropolitan spheres of influence: inter-city movement and intra-city movement.

**5.2.1.2 INTER-CITY MOVEMENT**

Tshwane forms part of a larger Gauteng urban region and its economy is closely connected to the spatial economy of the neighbouring municipalities and also nationally is part of the economic engine of the country. From that perspective the
The following routes are the most important to connect the areas of opportunity in the city to other areas of economic significance:

- The PWV2/N4 Platinum Highway, linking Tshwane in an east-west direction to port destinations (Maputo/Walvis Bay) and several significant regional centres of production.

- The N1 and R21, linking Tshwane to the economic growth areas of Gauteng, and creating amazing opportunities in terms of economies of scale, visibility, accessibility.

- The PWV9/ Western Bypass (north), the missing link in the west and north of Tshwane. Without this link, large areas of our city remain marginalised in terms of access to areas of opportunities, and lack support for the latent development potential of the west and north.

- The R25 Provincial Road serves the eastern part of the eastern corner of the CoT and the south–east between Bronhorstspruit/Sokhulumi and Kanan/Bapsfontein. This route also links the area with O.R. Tambo International Airport.

- The R104 Provincial Road runs through from region 3 to region 7 in an east-west direction parallel to the north, and forming part of the N4 to the east. This route links up with Emalahleni Local Municipality to the east.

- The R513/R42 road links the industrial area of Ekandustria with O.R. Tambo International Airport.
The following is a comparison of terminology from three selected sources as contained in the South African RCAM Manual:

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1</td>
<td>Mobility</td>
<td>Principal arterial</td>
<td>Primary distributor</td>
<td>Principal arterial</td>
</tr>
<tr>
<td>Class 2</td>
<td></td>
<td>Major arterial</td>
<td>Regional distributor</td>
<td>Major arterial</td>
</tr>
<tr>
<td>Class 3</td>
<td></td>
<td>Minor arterial</td>
<td>District distributor</td>
<td>Minor arterial/ activity arterial - spine</td>
</tr>
<tr>
<td>Class 4</td>
<td>Access / activity</td>
<td>Collector street (4a commercial, 4b residential)</td>
<td>District collector</td>
<td>Activity street</td>
</tr>
<tr>
<td>Class 5</td>
<td></td>
<td>Local street (5a commercial, 5b residential)</td>
<td>Access road</td>
<td>Residential Street</td>
</tr>
<tr>
<td>Class 6</td>
<td></td>
<td>Walkway (6a pedestrian priority, 6b pedestrian only)</td>
<td>Non-motorized access ways</td>
<td>Non-motorized</td>
</tr>
</tbody>
</table>

5.2.1.3 INTRA-CITY MOVEMENT

In terms of intra-city movement, the two most important objectives are to establish a supporting network of roads to ensure that the potential created by the abovementioned roads is drawn into the city and the energy released to stimulate development and growth, and secondly to effectively link the multi-nodal structure of the city to support movement between different strategic nodes.

In terms of the first objective – to support the development potential generated by the strategic inter-city linkages, a number of roads have been identified as very important to fulfil such a function. This will be elaborated on with more detailed planning exercises for the development corridors as part of further planning. The following roads are however very important to support this objective:

- the Olievenhoutbosch Road Activity Spine
- the Lavender Road link to the K97 interchange already constructed on the PWV2.
- K54 (N1/N4 link) in the south-east of Tshwane
- Old Johannesburg Road (R101)
- K71 (R55)
- K69 (Hans Strydom Drive)

Further detailed studies into our movement system by the Transport Department will likely indicate further roads that are to be added to this list.

5.2.1.4 ROAD FREIGHT

In 2005 it was estimated that there were about 35000 heavy vehicles daily on the roads within Tshwane. An updated study will surely point to a significant increase in these numbers.

The following areas were identified as freight transport generators:

1. Rosslyn/Klerksoord
2. Silverton/Waltloo/Samcor Park
3. Pretoria West/Pretoria Industriat/ Iскор
4. Rooihuiskraal/Highveld Tecno Park/Simarol/ Gateway
5. National/International (Africa/Zimbabwe)

The following roads carry more than 1650 HVs/day

- Stormvoel Road
- Zambezi Road
- Lavender Road
- K8
- Mabopane Highway (R80)
- Van der Hoff
- Nelson Mandela Drive (R21)

The following roads carry between 1000 and 1650 HV/day

- (Kgosi Mampuru Street (formerly Potgieter Street)
- Hans Strydom
- Simon Vermooten
- Waltloo
- Quagga
- R28 (south of the R101 interchange).

Road pavements are designed to carry an estimated number of heavy-axle loads during its design life. The damage caused by overloaded axles increases exponentially and roads that carry many overloaded vehicles will deteriorate rapidly with serious economic maintenance consequences.

Strategically, funding will need to be budgeted to ensure that the maintenance of such roads, which are, in this context, providing the basis for economic development, is never neglected.

5.2.1.5 BUS SERVICES

Major bus routes are from Mpumalanga (former KwaNdebele), Shoshanguve/Mabopane and Hammanskraal to the Inner City. The services are operated from 14 depositories, 23 major terminals, 25 major bus stops and a large number of ordinary bus stops.

**Bus Operators**

The following 10 operators provide the main commuter services within the CoT area:

1. PUTCO Soshanguve
2. PUTCO Homelands from Mpumalanga
3. PUTCO Distribution from Belle Ombre
4. PUTCO Ekangala
5. PUTCO Mamelodi Bus Service
6. North West Star Batswana Gare in Mabopane, North-West
7. North West Star Botlaba from Hammanskraal
8. North West Star Thari from Brits
9. Atteridgeville Buss Service (North West Star affiliate)
10. Tshwane Municipal Bus Service
11. Thari from Brits

These bus services, which still run in the City, were developed as part of the apartheid policies to keep African people out of the central city areas. Thus, a number of inefficiencies exist within the services. A rationalisation plan will need to be implemented in order to ensure that all necessary routes are covered to an acceptable standard for use by all citizens of Tshwane.

5.2.1.6 MINI BUS TAXIS

Mini bus taxis play an integral role in transporting masses of commuters from point A to point B daily. Mini bus taxis closed the gaps where apartheid transport planning would not. Still today, they continue to play the same role, but for a different reason. Our public transport network is not yet at the stage where all communities are adequately provided for. Taxis can be found throughout the City.

Taxi services are, like current rail services, not services that always use by choice. Levels of safety, comfort and customer relations can often be a hindrance when one has other options.

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2 City of Tshwane, Integrated Transport Plan 2006-2011
Note: at the time of preparing this document, the ITP was still being updated.
The operational plan of the IRPTN will include a phased plan that will see the transformation of the taxi services such that they eventually comply with the City’s overall IRPTN and transport plans. The transformation of public transport together with mainstreaming of the minibus taxi industry forms part of the IRPTN network and operating entity towards improving the current public transport system. The IRPTN will optimize modal utilisation selecting the appropriate mode for services and eliminate competing/parallel services. Freight movement will, as far as possible, be restricted on the major public transport routes.

5.2.2 RAIL

The railway network should be the backbone of long-distance travel, within Tshwane and providing connectivity to surrounding municipalities and provinces.

The introduction of this document illustrated the extensive boundaries of Tshwane. There are a number of commuters who, due to unique circumstances, will have to daily or weekly traverse the length or breadth of Tshwane to commute from home to work and vice versa.

On the other hand, there are also a number of people that live within Tshwane but work outside of Tshwane boundaries (and vice versa) who will like-wise require a quick and cost-effective manner of commuting from one end to the other.

While Tshwane has a comprehensive network of rail infrastructure, certain parts of it have been decommissioned, while others (including the train station) are not well maintained and in a state of disrepair. The perceptions around rail in Tshwane are not positive, and one would not ordinarily make use of the rail network unless they had no other choice. It is therefore critical that planning for our trains and train station is such that the standard of service offers a safe, attractive and efficient service that would even be used as an option by business people.

Consideration should equally be given to other transport network initiatives that are being planned for the City, specifically the BRT in this instance. Prasa’s rail national prioritisation plan includes a rail alignment for Tshwane that connects Kopanong in Soshanguve south to Tembisa in Ekurhuleni Municipality. Looking further into Tshwane’s strategic future (20-30 year horizon) the following rail links are further proposed in terms of the MSDF: North South linkage from Hammanskraal to Centurion, intersecting at the Daspoort and Hercules stations to give the option to travel in the direction of Atteridgeville, Bronkhorstpruit and Cullinan;

- East West linkage from Saulsville Station to Bronkhorstpruit, intersecting at Daspoort and Hercules Stations to give the option to travel in the direction of Hammanskraal or Centurion
- The connection Northwards from the East West Linkage connecting to Cullinan and Ekandsustria (nodes of employment)
- The North South linkage to the Inner City from Kopanong in Soshanguve South will be catered for by the BRT. The BRT should offer stops at both the Daspoort and Hercules Stations, in order for one to be able to catch the train on the proposed North South of East West linkages.
Further, it will be important that both the BRT and the rail system will be supported by Tshwane Bus Services in the North West of Tshwane, closing the gap between Hammanskraal and Mabopane, offering stops in Dlopye, Stinkwater, Soshanguve and Mabopane. In the medium to long term, should funding be available, the commuter railway line should be extended to link from Hammanskraal to Mabopane.

The rail network in the Tshwane metropolitan area additionally comprises a circular system around the Inner City (i.e. the Ring Rail) which is linked via feeder lines to communities on the periphery of the municipal area (e.g. Ga-Rankuwa, Mabopane, Temba, Soshanguve, Atteridgeville and Mamelodi). The ring rail network itself links with a number of activity nodes, including a variety of education, health, sport and recreation facilities, as well as a number of residential areas of all income groups.

The importance of the Capital Core cannot be overemphasised. The inner city still remains one of the most important employers in Tshwane. Thus, access to the inner city is vitally important for the overall economic sustainability of the City. Along the existing rail infrastructure tracks, is the ‘ring-rail’.

Passenger rail is managed by the Passenger Rail Agency of South Africa (PRASA), formerly the SARCC (South African Rail Commuter Corporation).

Rail Freight is managed by Transnet Freight Rail (TFR), and is the largest division of Transnet, specialising in the transportation of freight.
Note: At the time of preparation of this document the Integrated Transport Plan was still being updated to incorporate former Metsweding areas.
Tshwane Metropolitan Spatial Development Framework 2012

Diagram: Short – to Medium-term Prioritisation of Commuter Rail upgrades

TSHWANE METROPOLITAN SPATIAL DEVELOPMENT FRAMEWORK 2012
The aim of the Ring Rail project is to optimally utilise the existing, centrally located rail infrastructure to enhance public transport in the metropolitan area through the integration of land uses and transport modes. The Ring Rail provides an ideal opportunity for densification and mixed-use development in the central part of the metropolitan area, and more specifically the roughly 1km influence area around the network. The ring-rail system will move a great number of people into the CBD.

Through the rationalisation of the IRPTN operational plan, other forms of public transport should support the feeder routes of the ring-rail.

THE COMMUTING BURDEN

A single mother of four children aged between 3 and 12 lives in Tembisa (Ekurhuleni Municipality) with her mother. She spends nearly five hours each day commuting to and from work in the Tshwane suburb of Brummeria, where she is an office cleaner. The journey costs nearly 40% of her monthly salary of R1900. She leaves home at 05:00 to be at the office at 07:30, starting with a 3km walk to the taxi stand, which takes her to the train station. In Tshwane, she takes another taxi to Brummeria. After leaving work at 16:00, she may not get home until 19:00, as the trains are often late. She spends over R700 a month on transport and nearly 100 hours on the road.

Source: National Planning Commission, 2011
5.2.2.1 GAUTRAIN

The Gautrain is a high-technology rapid rail network that runs between Johannesburg and Tshwane. It is a strategic development initiative that is aimed at economic development and job creation, over and above its benefits from a public transport perspective and the reduction in traffic pressure on major roads especially between Pretoria and Johannesburg.

The Gautrain incorporates the following stations:

- OR Tambo International Airport
- Sandton
- Rhodesfield
- Park Station
- Marlboro
- Midrand
- Centurion
- Pretoria
- Hatfield

As such, the Gautrain will have a major impact on the demarcated destinations Gautrain stations in Tshwane (i.e. Centurion Station, Pretoria Station and Hatfield Station) in terms of future development of these areas.

The aim of the Gautrain Rapid Rail Link is to serve as a commuter link between cities and to enhance the accessibility to the major centres in Gauteng. It is envisaged that the Gautrain Rapid Rail Link will contribute to the development of the Gauteng Province by regenerating the Inner Cities, strengthening of existing nodes and infrastructure, and creating new growth areas.

The Centurion property market is set to receive a huge boost in as a result of the Gautrain. In addition to this, the newly upgraded highways will make the Centurion area a more economically viable area to locate business enterprise, including increased accessibility to potential a potential workforce from areas south of Tshwane. The newly planned Tshwane International Convention Centre (TICC) and the Centurion Station is expected to influence property values positively in the area.

Like Johannesburg Park Station, Pretoria Station is situated in the inner city which is already formally established and forms the economic core of the metropolitan area. Pretoria Station is deemed to bring with it urban upliftment and revitalisation encouraging business, residential and tourism trips. In particular existing land uses must be improved and renovated and pedestrian links created ensuring safe passage for commuters.

The draft Urban Development Framework for the Hatfield area aims to increase transit-oriented developments around the station. These developments will benefit from the fast and reliable public transport service, but will also contribute to increase the patronage.
of the Gautrain, particularly passengers that walk to the station. The other objective is residential densification. There is an international tendency of densification around public transport nodes, particularly metro and inter-city railway services such as the Gautrain. Increased densities of residents are a prerequisite of a viable and efficient public transport service and a policy of residential densification will support the feasibility of the Gautrain.

To ensure the viability of these stations, the areas around the stations will have to comprise of a specific land use mix (with a strong emphasis on residential development) at a specific intensity and density with a strong focus on pedestrians and inter-modal transfer facilities. They will also have to comply with specific urban design requirements. Local Spatial Frameworks and Precinct Plans for and around these areas will guide the implementation of development here.

The development of the rapid rail (Gautrain) towards the south linking with the economic centres of Johannesburg and the Airport is a major step in a strategic change in direction from a predominately private vehicle transport system to creating an appropriate alternative in the form of a public transport system over the long term.
The Gautrain project team is currently investigating the possibility of extending the Gautrain line from Hatfield to Soweto. From a strategic spatial planning point of view, and in view of the fact that Menlyn has been identified as a metropolitan node, this extension is supported.

5.2.3 AIR

The linking of the city to other localities within the country and internationally is important for the city’s competitiveness and global positioning. To be a “capital city of excellence” would also imply being accessible by air from an international point of view, not only from an economic point of view but also politically.

The City of Tshwane is the home of two Military Air Force bases (Waterkloof and Swartkop) which are located in the south western part of the city and one national airport (Wonderboom) located in the north western part of the city.

See Diagram 14.

The Waterkloof Airport plays a significant role in accommodating the movement of people with the focus on VIP protection. This is very important for Tshwane’s functioning as a Capital City.

The Wonderboom Airport falls within the Zone of Choice. The Zone of is a strategic investment focus area intended to have a
positive catalytic effect on development within the north eastern areas of Tshwane. The CDS aims to focus on addressing the inequitable service delivery reality; meet the needs of the local population in a sustainable manner; revitalise and stimulate growth in the local community and to provide livelihood and dignity to all.

The reason why this area has been identified as the Zone of Choice is related to its proximity to the Capital Core, existing infrastructure (such as the N4) and the momentum of existing developments such as the industrial area of Rosslyn.

Aviation activities in and around the City of Tshwane are not only limited to the three main airports mentioned above, but there are also smaller airfields which are privately owned where there is some activity of gliders and microlights such as Kitty Hawk Aerodrome. The spatial framework for the Zone of Choice has been prepared and was finalised in 2012.

5.2.4 SPATIAL ECONOMY OF TRANSPORT PLANNING

The importance of the movement and connectivity system was explained in the introductory part of this section. All strategic matters relating to transport (spatial form, environmental impact, economic development, social equity) have a place in the spatial economy. The nodal concept, on which the sustainable, resilient and competitive Tshwane will be based, is reliant on transit-oriented development. Transit-oriented Development (TOD) supports the basic spatial concept of sustainability (both social and economic). Sustainability in this context refers to the optimal use of land through densification, infill and consolidation and spatial integration giving equal opportunity; correction of spatial imbalances, creation of sustainable human settlements and social equity.

Transit-oriented development will address spatial restructuring by ‘stringing’ the city’s node’s together, effectively making the city ‘smaller’ and travel distances ‘shorter’ through an efficient integrated rapid transport network (IRPTN), which will optimally integrate road, rail and air transport within the CoT. The IRPTN will thus allow that, regardless of one’s location in the city, equal access for all residents to all nodes will be provided for. In addition, labour markets will be spatially integrated and true flexibility regarding one’s place of residence versus place of work will be catered for.

A city that operates efficiently, as has been described above, is a competitive city.
How Far Will Transit Users Walk? How Large Can A Transit-Oriented Development Be? There are often questions as to how far people will walk to a transit stop or station, and therefore the acceptable area that can be considered transit oriented. Experts generally conclude that transit riders will walk up to 500m to a bus stop and a 800m to a train station, although in practice a portion of transit riders will walk somewhat more. Acceptable walking distances tend to be affected by: Whether travelers are transit dependent or discretionary users (transit dependent users tend to be willing to walk farther. Walking conditions are convenient and comfortable, with good Connectivity that creates direct routes, good sidewalks and crosswalks, minimum waits at crosswalks, safe and secure walking conditions, and attractive streetscapes (such as storefronts and shade trees). There is high quality transit service. People tend to walk farther if transit service is frequent, and vehicles and stations are comfortable and attractive.] (Victoria Transport Policy Institute, 2011)
Key characteristics of transit-oriented development include:

- a rapid and frequent transit service
- high accessibility to the transit station
- a mix of residential, retail, commercial and community uses
- high-quality public spaces and streets which are pedestrian and cyclist friendly
- medium to high density development within 500 metres of a transit station
- reduced rates of private car parking.
- Reduced carbon footprint
- Development Corridors
- 24-hr City

This means that developments (addressing relevant spatial directives) that cater for, or provide public transport solutions or align themselves along public transport routes (particularly those in nodal locations) will be prioritised. The decrease of private vehicle usage will also promote pedestrianisation of urban areas and an overall decreased carbon footprint. On the reverse side, in order for efficient transport systems to be sustained, a critical mass of users must be achieved. This means that localities that would induce the convergence of large numbers of people would be required. This again, brings us back to the nodal concept of the widest possible range of services within an area and highest residential densities being supported. The higher the rate of usage of the public transport system, the more affordable it will be. At the same time, the convergence of a large number of private vehicles in a locality causes traffic congestion and an avoidance of such an area by those who have alternatives. Removal of private vehicles can effectively improve the quality of an environment. Additionally, the intensity of transit-oriented developments also creates vibrant 24-hour cities.
DIAGRAM 21: Transit-oriented development
A spatial analysis of the CoT, looking at where the highest densities of people currently reside, versus their distance from work opportunities, was done. The analysis identified the following areas as areas that will need to be addressed by the IRPTN. The IRPTN will attempt to:

- Efficiently integrate various commuter transport modes
- Maximise coverage of commuter transport system
- Minimise need to transfer from one service to another

The IRPTN may be served by road or rail transport. This includes the Gautrain. What is very important is that the catchment area of each node is fully covered in terms of feeder route systems that support the main transportation routes i.e. a person should not have to walk more than 800m within a node to find a form of public transport. It is equally important that the route to the public transport mode or facility is fully pedestrianised. During 2012, the City will appoint consultants to develop the updated Integrated Transport Plan (ITP) of the City. The ITP will influence the IRPTN. Current indications around the IRPTN indicate that nodal connection will be provided for. Further guidance on future plans for the IRPTN network can be obtained from the Roads and Transport Department of the City of Tshwane.
DIAGRAM 22 : Schematic Representation of a well-integrated transport system
The historic road network concentrated on one core area, the Inner City, but the new urban spatial form is characterised by a multi-nodal form, which have more complex inter-relationships.

If one considers the current low density and dispersed development patterns that characterise the city, the critical role of road based public transport must not be underestimated, especially in the areas of the city where private motor vehicles are the norm. A flexible, mobile form of public transport is necessary to serve these areas, where rail is definitely not going to provide the answer for shorter intra-city trips. The MSDF has identified a number of vehicular routes that could link the Metropolitan Activity Areas and therefore become the most important vehicular public transport routes. These roads must also be prioritised in terms of further planning and implementation to support their strategic functioning.

The concept of the road-based movement system in terms of the role and function of different routes and the supporting land use typologies that could and should be developed along these routes will be refined as part of the further planning within the RSDFs and LSDFs and shall be integrated with the Integrated Transport System. The mobility function of these routes is very important as they must be able to effectively move people and goods between areas of significant opportunity.

The linkages are –

- Atterbury/Charles (M11)
- the K14, joining Rachel de Beer Street and Sefako Makgatho Drive (formerly Zambezi Drive), and the extension of Braam Pretorius Street westward to the Paul Kruger extension (to improve east-west movement north of the mountain and to link to the Inner City)
- Sefako Makgatho Drive, K17, Rachel de Beer linkage
- Doreen Street and Heinrich Road extension connecting Klip-Kruisfontein and Mabopane Urban Cores
- (Stanza Bopape, Helen Joseph and WF Nkomo Streets (formerly Church Street East and West), connecting the Eerste Fabrieke Station, Hatfield, Inner City and Atteridgeville nodes
- Christiana de Wit Drive / Botha Avenue / River Road connecting the Inner City and Centurion nodes
- Lynnwood Road / Atterbury Road / Garsfontein, Solomon Mahlangu Drive (formerly Hans Strydom Drive), Charles Street/George Storrar Street/ Duncan Street route connecting the Mamelodi, Menlyn, Brooklyn and Hatfield nodes
- Stormvoël Road / K16 route connecting the Eerste Fabrieke, Capital Park and Inner City nodes
- Soutpansberg Road (and its proposed eastward extension)
The Capital City should strive to be a leader in the built environment. One way of doing this is to promote creativity and landmark designs in locations where they would be most visible, thus showcasing a positive city image. A landmark is defined as an object or feature of landscape or town that is easily seen or recognised from a distance. Landmarks serve two useful purposes. The first is as an orientation cue. If the navigator knows where a landmark is in relation to his present position, he can say something about where he is, and which way he is facing, in the space he shares with the landmark. A desirable property of a landmark for this use is visibility, the ability to be seen from a large surrounding area. Such ‘global’ landmarks can help the navigator judge his orientation within a wide area, as opposed to local landmarks, which can be seen only in the immediate vicinity. A system of local landmarks which exhaustively cover the space can also provide the same cues as a single, towering landmark. The second use of a landmark is as an especially memorable location. It is this second use wherein the importance of creativity and originality is especially important. This creativity and originality of a landmark assists with ‘city imaging’ making specific sites within a city easily identifiable and distinct, even for first-time visitors to a city.

Apart from the nodes, development corridors equally (if not more-so) offer high visibility. The N1, N4 (Platinum Highway), N14 and R21 have been identified as development corridors on the metropolitan scale. The Regional Spatial frameworks will further identify development corridors on the regional scale.

Relative to the Midrand and Johannesburg areas, the CoT has a vast length of un- or underutilized metropolitan development corridors, and there still exists an untapped potential to welcome iconic and economically stimulating developments along our highways.

5.2.5 WHAT IS A CORRIDOR?

A corridor is defined as a belt of land between two other areas typically having a particular feature of giving access to a particular area. It is typically a linear element linking two nodes, being origin and destination driven.
Major Regional Corridors identified in the GSDF are:

- N1 (Polokwane/Tshwane/JHB/Vaal/Bloem/Cape Town)
- N 4 (Rustenburg/Tshwane/ Witbank)

Major Provincial Corridor identified in the GSDF is:

- R21 from Tshwane to OR Tambo International Airport
5.2.5.1 SIGNIFICANCE OF CORRIDORS

N1

The N1 has significance since it links the northern border of the country to Zimbabwe (Beit Bridge), to the southernmost tip of South Africa (Cape Town), while passing through the metropolitan areas of Gauteng (Cities of Tshwane and Joburg) and other smaller towns.

Commodities traded along the corridor from the north, include tourism services in particular those who visit game reserves in the Limpopo and Mpumalanga provinces. The route forms a gateway into Africa via Zimbabwe, to Bulawayo and Harare and proceeds to the SADC countries to the north. The route assists in the transportation of passengers from the African countries as well as in trading of raw materials and goods. Beit Bridge border post forms a trade port, one of the busiest border posts from South Africa.

The N1 passes through the City of Johannesburg that houses the headquarters of significant financial institutions, tertiary economic sectors, information technology companies and various provincial government departments. Various companies have their offices along the N1 between the Cities of Tshwane and Joburg. Residential villages have also been established along the N1 in this area. The Gautrain was introduced between the two metropolitan areas to alleviate traffic on this part of the N1.

The N1 to the south of Gauteng passes through towns surrounded by rural areas and agricultural areas.

N4

This corridor is also known as the Maputo Development corridor and links Gauteng, with Maputo in Mozambique via Mpumalanga as well as Gauteng with the North West Province and further west to Namibia.

Various mining activities are located along this route and raw materials as well as manufactured products are transported along this route.

The N4 also links the tourism area of Mpumalanga and Limpopo, including the Kruger Park with Gauteng.

The Komati border post together other larger cities are a trade posts along this route.

The N4 is a significant with regards to transport of products manufactured in the City of Tshwane e.g. from Rosslyn.

The route also links Gauteng with Sun City a prominent tourism as well as conference and recreation destination.

R21

The R21 provides easy access from the City of Tshwane to the OR Tambo International airport (essential for the large number of embassies based in Tshwane).

Warehousing and distribution is also an important use located along this route.
Urban Corridors and Activity Spines as depicted in the GSDF
A study by the United States Government Accountability Office found that the average capital cost per mile (1.6km) for bus ways was $13.5 million while light rail average costs were $34.8 million. However, a huge range of capital costs can be seen, as BRT lines can cost anywhere from $200,000—$55 million per mile, while LRT lines can range from $12.4—$118.8 million per mile. The total investment varies considerably due to factors such as cost of the roadway, station structures, park-and-ride facilities, traffic signal systems and vehicles.

New York City Subway: ground broken in March 1904, cost of $35 million to build 93km of tracks

Curitiba BRT covers approximately 60km, development cost of approx $1,15 billion /km ($69billion= R483billion)
5.3 ENVIRONMENTAL STRUCTURING CONCEPT

The Environmental Structuring Concept is built around creating linkages between the city’s built form, its cultural heritage, symbolic locations, landmarks and the natural structuring elements.

5.3.1 HERITAGE AND CULTURAL SITES

Tshwane’s urban form and identity is closely linked to the influence of its natural and cultural elements. The developed areas are intimately intertwined with open spaces, creating a city with a unique character. The spatial development of the city should continue to value the role and prominence of the natural environment that sustains and informs the city. The natural structuring elements of Tshwane are those physical features that have, to a great extent, influenced the historical growth and settlement development pattern and that have an important role to play in the ecological integrity of the metropolitan area.

With regards to the cultural heritage of the city, conservation worthy, distinct/unique areas reflect the continual changes in the socio-economic status, value systems, lifestyles, habits, aesthetic criteria and social interactions of their inhabitants over decades and sometimes centuries. They are therefore important elements of the community’s collective memory and their sense of identity. The uniqueness of these areas, which has arisen from the unique geographical, topographical, social, cultural, political, historical, economic and other circumstances in which they were developed, has the potential of attracting both locals and tourists, and inspiring future developments.

In terms of the cultural heritage of the city, certain areas are identified as unique areas including the Union Buildings Precinct, Church Square, Marabastad, Bryntirion/Lisdogan/Eastwood and Irene Village. A Heritage Policy and Plan that deals with the identification of heritage worthy sites, topographical characteristics, landscaping, layout elements, land uses, activities, structures, architectural features, controls and incentives aimed at the development guidelines, controls and incentives aimed at the preservation, enhancement and utilisation of those features and further development of the areas. Other areas may also be identified in terms of the RSDF’s as unique areas of cultural significance and should also be described in terms of specific Precinct Plans. Precinct plans should incorporate the guidelines of the approved Heritage policy into the spatial fabric.

As a leading African Capital City that aims to attract world class investment, the Heritage Policy should be careful to balance the needs of a developing and growing metropolitan city that is subject to area renewal and regeneration, some of which may affect heritage sites. Considerations around attracting economic investment (and job opportunities) vs. the retention of a heritage site will need to be carefully deliberated.

Special sites such as memorials, gardens of remembrance, walls of remembrance, markers, triumphal arches, water features, monuments, statues, museums, forts, battlefields, cemeteries, mausoleums, cenotaphs, etc. that symbolise people’s values,
beliefs, aspirations, important personalities and important historical events are needed. It is particularly important for Tshwane, which houses the Capital of South Africa, to project the image of the entire nation and to reflect, therefore, the values, beliefs, history, achievements and aspirations of all South African racial, ethnic, religious, gender and other cultural groups.

The heritage, both natural and cultural, is a valuable, finite, non-renewable and irreplaceable resource which must be carefully managed. Every generation has a moral responsibility to act as a trustee of the natural and cultural heritage for following generations. In a spatial context, areas with distinct and unique character, as well as places and structures of definite historical, aesthetical or symbolical merit have to be conserved in order to:

- provide the necessary link between the city and its past, as well as current residents and their ancestors
- create a sense of place
- establish a system of lasting points of reference
- nourish the sense of belonging to the city and boost the civic pride
- enhance the uniqueness, identity and attractiveness of the city.

The CoT has a number of noteworthy tourism sites, some of which are mentioned in Annexure 4. Cullinan receives special mention as the ‘small town’ serves as a tourism node in its entirety.
DIAGRAM 25: Heritage and Cultural Sites
5.3.2 OPEN SPACE NETWORK

A well-defined open space network is an important and integral part of the Spatial Development Concept of the MSDF. The Tshwane Open Space Framework was approved in November 2005. The Framework will need to be reviewd and updated to include the newly incorporate areas of Tshwane. The Environmental Structuring Concept provides guidance on the conservation and enhancement of the natural and cultural heritage.

The development of an open space network is an integral part of shaping the city. Ecological resources are irreplaceable and should thus be one of the major structuring elements guiding the development of the city instead of unplanned urban growth taking precedence and open space becoming merely land that is not desirable for urban development and thus ‘left over’ space. An important step in shaping urban form is thus the determination of an open space network, which contains natural processes and systems.

The open space network is concerned with the spatial structure of green areas in the urban landscape and with all planning activities that are essential to create conditions for green areas to perform ecological services and to contribute to the quality of urban life. It is thus used to indicate the position of green areas in the urban landscape. As such it has spatial, social and technical dimensions. An open space network is also a planning concept, indicating the intention to develop planning and management tools for the structural role of green areas in the urban fabric and the urban organization.

An open space network contains not only the elements that constitute the open space in itself (vegetation, water, animals, natural materials etc.), but above all how the various open spaces are shaped in relation to the concepts of distribution and organization, to form a system of open spaces. An open space network incorporates a wide variety of open spaces into one system. Open spaces cease to be discreet elements within the city but together form a network in which each component contributes to the whole.

It must be stressed that an open space network does not focus only on ‘green’ spaces, but also on more urban or ‘brown’ spaces as well as spaces that contribute to the place-making of the city.

An open space network is thus important for two reasons:

- As an interlinked system of open spaces in a city, it can perform additional functions, besides the functions performed by single green areas, such as improved biodversity.

- It can be used as an attempt to better integrate green issues in urban land use planning and urban design as it contains the idea of an interaction between the built part of an urban context and the signs of nature.
To ensure the sustainable use of the Open Space network, it is clear that land use planning should be done in relation with the network. It is thus important that land uses with the potential to generate positive activity in the open space be located adjacent to the network. It is further important that attention is not only given to land uses per sé, but specifically also to land use typologies and the manner in which they impact on the quality of public open space. The interface between the land use typology and the open space should specifically be addressed.

**PRINCIPLES**

The principles of the 2005 TOSF are based on the following typology layers:

<table>
<thead>
<tr>
<th>Function</th>
<th>Nodal</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecological</td>
<td>Green Node (e.g. conservation area)</td>
<td>Green Way (e.g. ridge)</td>
</tr>
<tr>
<td></td>
<td>Blue Node (e.g. dam, wetland)</td>
<td>Blue Way (e.g. watercourse)</td>
</tr>
<tr>
<td>Socio-Economic</td>
<td>Brown Node (e.g. sports stadium, urban core, recreational park)</td>
<td>Brown Way (e.g. activity street)</td>
</tr>
<tr>
<td></td>
<td>Grey Node (e.g. landfill site, cemetery)</td>
<td>Grey Way (e.g. servitude)</td>
</tr>
<tr>
<td>Place making</td>
<td>Red Node (e.g. gateway, landmark, square)</td>
<td>Red Way (e.g. boulevard, ceremonial route)</td>
</tr>
</tbody>
</table>

The MSDF proposes a certain urban quality around nodal areas, specifically discussed in Chapter 4- Green Economy of Spatial
Planning. Integration of the green areas with nodal areas that are well connected will create green corridors within urban areas.

Open Spaces thus include the following:

**Conservation Areas**: Areas designated for nature conservation, which may include tourism related facilities and recreational facilities directly related to the main use.

**Tourism and recreational related facilities**: Outdoor and tourism related activities, including hiking trails, hotels, 4x4 trails, wedding venues, conference facilities, curio markets, farm stalls, restaurants, game lodges and resorts with a rural character with due consideration to its impact on the surrounding area and environment. The CoT has tremendous opportunities in the eco-tourism arena. Most of the eco-tourism activities occur along the Roodeplaat Dam which is situated in the north of Cullinan (Zambezi) Road on the farms of Zeekoegat, Leeuwfontein and Roodeplaat. There is also the Dinokeng Blue IQ project. Eco-tourism activities that can be enjoyed include but not limited to the following: game farms, nurseries and bird watching to mention but a few.

**Residential (within the natural areas where you find irreplaceable, important and highly ecological sensitive sites)**: Environmental Estates where the primary focus is the conservation of the natural resource (open space). Conservation in this sense must not be seen as only protecting special or sensitive environments, but conserving open space as a valuable resource itself. The residential development is seen as a mechanism to protect and enhance the open space character, and not as an end in itself. Special conditions shall apply in the consideration and approval of such developments, including the following: Dwelling units shall be grouped together in as few clusters as possible; a Strategic Environmental Assessment shall be done to determine the open space, the position of the development clusters, the position of ancillary uses, roads; conservation conditions shall be strictly adhered to; conditions shall be set for the design, character and overall relationship with its environment.

Roodeplaat Dam and Bronkhorstspruit Dam are under immense pressure from high income essential enclaves. Increased development pressure could cause serious degradation of the natural areas as limited environmental management guidelines exist.
Agricultural land use encompasses purposes normally associated or reasonably required in connection with agricultural purposes and agri-villages. Dwelling units must be related to the agricultural use of the property. “Community Agricultural Centres” are “Agricultural Project Areas” that have been planned to include a range of agricultural activities, including agricultural product beneficiation. Land specifically identified as high potential farmland for productive and sustainable commercial agriculture (i.e. the cultivation of crops, rearing of livestock, extensive game farming, as well as processing of agricultural products should be protected from development and suburban encroachment. These areas are highly suitable for agricultural use and must not be seen as mere vacant land waiting for development. The availability of water is however an important factor for the viability of this activity. Because of the above, the subdivision of high potential farmland should not be readily permitted, except in special circumstances. It is possible that smaller farm portions could also be viable for intensive agricultural purposes, and if subdivision is necessary to facilitate this, it should be supported.

In these cases the subdivision applications must be clearly linked to business plans to support such intensive farming enterprises. Activities and structures within these areas shall be restricted to:

- extensive/intensive commercial agriculture
- farm stalls and home industries
- accommodation for farmers and farm workers; and
- hospitality facilities secondary to the farming activity.

The afore-mentioned activities will furthermore be assessed in terms of their specific impacts on the environment in terms of current environmental legislation or on specific request by Department of Agricultural and Environmental Management (CoT). Proposals will not be supported if bulk infrastructure capacities are exceeded or satisfactory service arrangements cannot be made. Satisfactory arrangements will specifically include an acceptable level of impact on environmental sustainability.
DIAGRAM 26: Urban and Natural Environments

Legend
- River
- Dams
- Built-up Urban Areas
- Natural Structuring Elements
- Cultivated and Natural Areas
SPATIAL DEVELOPMENT CONCEPT

The Spatial Development Concept is a visual illustration of the three spatial building blocks:

- Nodes and Activity Areas
- Movement and Connectivity
- Environmental Structuring Concept

These are, in turn, informed by the spatial directives of Chapter 4.
Diagram 27: Tshwane Spatial Development Concept