

## 2.5 SPATIAL ANALYSIS AND THE TSHWANE METROPOLITAN SPATIAL DEVELOPMENT FRAMEWORK

### Structuring Elements

The city structure is shaped by the **apartheid legacy**, which created polarisation between the majority of the city's residents. The result is mainly impoverished black people residing in the remote north-western areas and the relatively affluent, predominantly white population in the south and east.

The income gap between the poor and the rich is increasing, thus entrenching the polarisation. The spatial gap is also increasing, as new economic opportunities are developing even further away from the city centre to the south and east around the decentralised nodes. The denser settlements - where the poorest people live - are expanding on the northern periphery.

The city's function as **capital city** also had a strong influence on its function and structure. The link between the city and national government is reflected in all aspects of the city. The large tracts of land owned by government, especially the Defence Force, had a significant impact on the development of the city, mostly by acting as buffers and restricting spatial integration.

In terms of city **growth**, the city historically developed around a strong central core as a mono-centred city. Private investment patterns changed over time with increasing car ownership, and a ring of satellite nodes developed mostly along or at the intersections of the major arterials, and mostly to the east and the south. No decentralised nodes developed in the outlying areas to the north. These areas are still dependant on the Inner City for the majority of their needs. The distance and inaccessible location of poor neighbourhoods highlights their dislocation and marginalisation since they have the lowest provision of social facilities, the longest travelling times and the highest population density. These are also the areas that are growing at the fastest rate (population growth).

Furthermore, linear and multi-nodal development along major routes is a prominent trend. The decentralised, high-technology and information industries towards the east and south are rapidly expanding. The injection of capital and infrastructure in



this area will have a positive impact on the city's economy, employment opportunities, image of the city and efforts aimed at marketing and promoting Tshwane as a business-friendly destination. The development of high quality residential developments with associated supporting facilities in close proximity to these economic opportunities is a positive trend and contributes to the integration of land uses.

The impact of **subsidised housing** provision on the spatial form of the city is also significant. The bulk of Tshwane's subsidised housing is being provided in the northern areas of the city, together with projects in the east around Mamelodi and to the west around Atteridgeville. Olievenhoutbosch is one of the few subsidised housing areas in the southern part of the city. If one considers that the bulk of the economic opportunities are situated to the south and east of the city, it becomes evident that housing provisioning faces serious challenges in terms of integration with the larger urban area.

The major **regional influences** on Tshwane's spatial development are:

- The proximity to Johannesburg and JIA and corridor development along the National Route 1 (N1) and Regional Route 21 (R21). Most of the investment in the tertiary economic sector gravitates strongly towards Johannesburg. The high technology developments, i.e. the office, finance and information technology related developments, therefore tend to concentrate in the southern and south-eastern parts of Tshwane, particularly along the N1 which offers excellent accessibility and visibility, and along the R21. This has also contributed to the expansion of residential areas in the southern and south-eastern parts of the metropolitan area.
- The PWV2 National Road 4 (N4) - the spine along which a development corridor connecting Maputo on the east coast and Walvis Bay on the west coast of Africa will emerge. This corridor offers significant development opportunities in Tshwane, especially for export related activities. It is especially the area between the two off-ramps on the PWV2 (the N1/PWV2 off-ramp and the PWV-9/PWV2 off-ramp) that is prominent for development, also linked to the Automotive cluster and the Rosslyn/ Klerksoord industrial areas.
- The proximity to the North-west and Limpopo Provinces, which results in a constant influx of people (mostly unskilled and semi-skilled) into Tshwane.

These people generally tend to settle informally in the most northern part of Tshwane, which acts as a "transitional zone" for the first wave of urbanisation. The migratory characteristics of the people in these areas influence the type of interventions, facilities and services required.

- In the south-western areas of Tshwane the regional influence of low income housing areas on the northern boundary of the Johannesburg area (such as Diepsloot and Cosmo City) is also now becoming apparent. Within the context of the larger development trends of the two metropolitan areas these areas may not be so marginalised as may first appear.

Apart from the above regional influences the following are also prominent **local development initiatives** which are shaping the city's form and development patterns:

- Blue IQ Projects (economic infrastructure investment projects):
  - the Innovation Hub, a high-technology incubator located close to the CSIR and University of Pretoria (UP);
  - Gauteng Automotive Cluster, an aggregation of automotive assemblers, component manufacturers and material suppliers in the north of the city;
  - Gauteng Rapid Rail Link, a rail-bound mass transit system that will serve the Johannesburg/Tshwane and Sandton/JIA routes; and
  - Dinokeng, an "All of African in One Day" experience on the city's north-eastern boundary.
- Freedom Park Project, a development that will see the creation of a heritage precinct on Salvokop Hill, in close proximity to the Inner City.
- Maputo-Walvis Bay Corridor (Platinum Highway), which is intended to link Maputo with Rustenburg, Gaborone and Walvis Bay. It passes through the northern part of the city and intends to bring economic opportunities to this region.

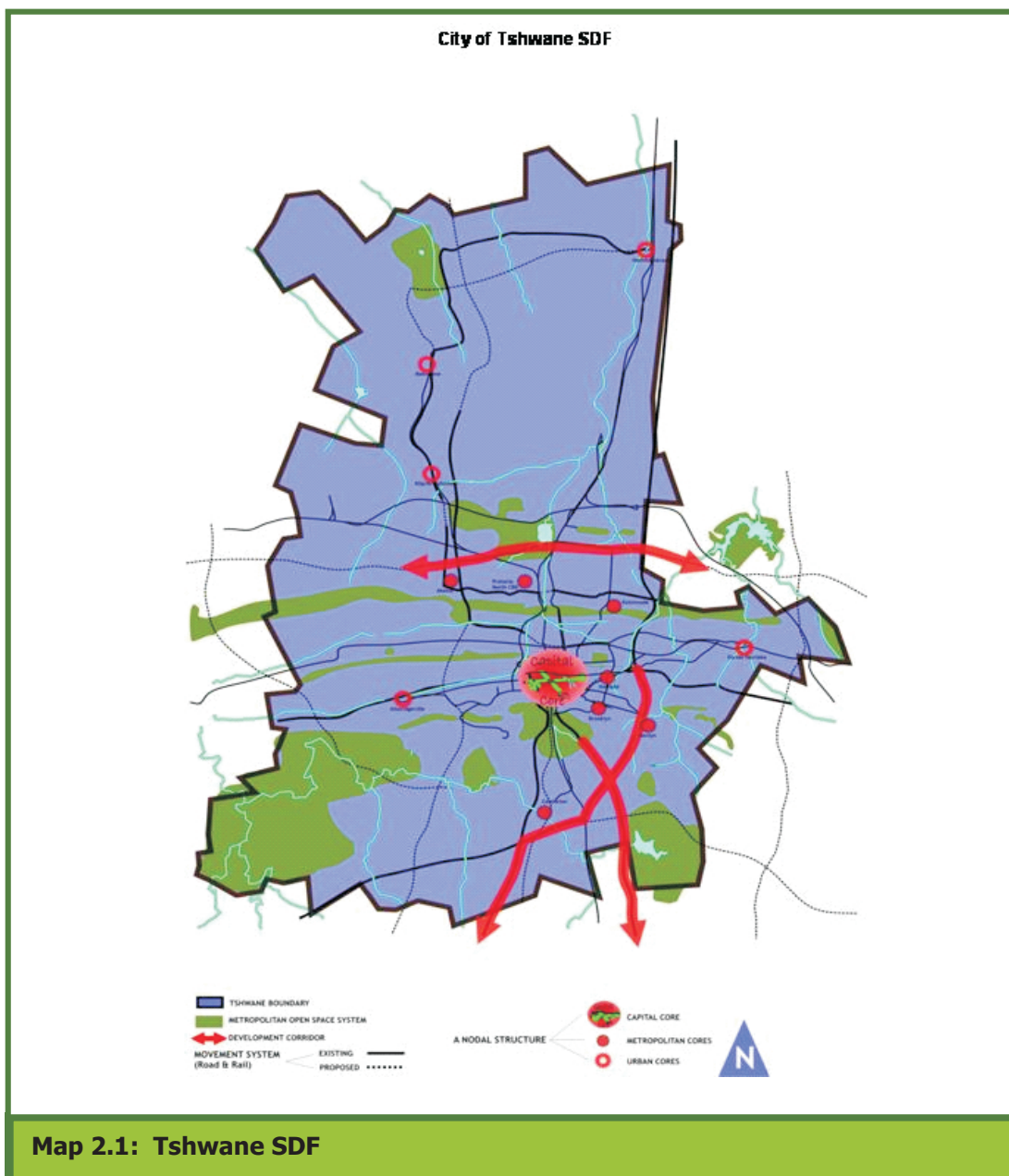
### **Metropolitan Spatial Development Framework (MSDF)**

The Metropolitan Spatial Development Framework (MSDF), which is a statutory input into the TIDP, has been approved by the Council on 23 November 2005 (Map 2.1). The complete MSDF as approved by Council is hereby acknowledged within the IDP, together with the eight Regional Spatial Development Frameworks which were



compiled as more detailed annexures to the MSDF. The following provides a short summary of the principles, objectives and spatial concepts of the MSDF.

The purpose of the MSDF for the city is to provide a *spatial representation* of the City Vision and the City Strategy and to be a tool to *integrate* all aspects of spatial planning (such as land use planning; planning of pedestrian, vehicular and other movement patterns; planning regarding buildings and built-up areas; planning of open space systems; planning of roads and other service infrastructure) as well as to *guide* all decision-making processes regarding spatial (physical) development.



The MSDF for Tshwane has two main focus areas:

- **Restructuring the city:**

The restructuring focus is to address the structural imbalances created by past apartheid policies, resulting in a major part of the city and its people being marginalised and excluded from urban opportunities.

- **Economic development and growth:**

These are crucial components of the spatial framework, in order to generate means to support and enhance urban development.

There are various interventions that may be utilised to support the focus areas of the MSDF, which are based on a number of considerations, which include:

- The importance of linking the people in the city to opportunities;
- Directing investments to places where it will have the most effect;
- Protecting and enhancing our natural and cultural resources for sustainability and to enrich our experience of the city, and
- Tying the growth of the city strongly into the economic fabric of the larger Gauteng region.

### **MSDF Spatial Concept and Proposals**

The MSDF has the **overall objectives** of efficiency, sustainability, equity and livability, and image. These overall objectives are supported by **specific objectives** which are:

- To stimulate development and growth;
- To use future growth and development to restructure Tshwane and to improve urban performance;
- To ensure sustainable use of environmental resources, their enhancement and replenishment;
- To use the valuable role of environmental resources to enhance the uniqueness, ecological sustainability and livability of the metropolitan area;



- To meet community needs and promote community values and aspirations;
- To ensure that the urban structure has timeless qualities and that it does not short-sightedly respond to the mere current needs, circumstances and fashion;
- To create new social and economic opportunities and to improve access to the existing ones;
- To promote the viability of public transport;
- To promote all aspects of spatial integration;
- To enrich people's lives, as well as to enhance the uniqueness and identity of Tshwane, by means of an interesting urban form and inspiring urban environments;
- To enhance the functionality of the city and its elements;
- To create healthy, comfortable and safe living and working environments for all; and
- To instill business confidence in the metropolitan area as a whole by providing an enabling spatial framework that supports development.

The spatial restructuring of the Tshwane metropolitan area is the most important aspect of the total restructuring of the City of Tshwane Metropolitan Municipality. It is the purpose of the **Spatial Development Concept** to provide a context for the restructuring by using five interrelated structuring concepts which include:

- Smart Growth;
- A System of Metropolitan Activity Areas;
- Movement System;
- Urban Lattice; and
- Environmental Linkages.

**Smart Growth** focuses on intensification and densification of the urban environment to create a more equitable, efficient, environmentally and financially sustainable urban dispensation. In terms of the MSDF a number of Metropolitan Activity Areas, Corridors and Activity Spines are identified. Densification should specifically be focused around these structuring concepts as first priorities of intervention. Intensification goes hand-in-hand with this approach to densification and is also structured around the Metropolitan Activity Areas, Corridors and Activity Spines. The purpose of such higher density residential development is to provide residential opportunities in environments that are high-intensity, mixed use,

pedestrian friendly and primarily public transport orientated where a number of economic and social opportunities are available within a relatively compact geographical area. These areas should also be linked to the Tshwane Open Space System to support their viability.

The management of urban growth and the importance of protecting and enhancing our valuable natural resources are also considered in terms of the Smart Growth approach.

The **Metropolitan Activity Areas** consist of a Capital Core, Urban Cores and Metropolitan Cores, Specialised Activity Areas, complemented by linear activity areas in the form of Activity Spines. The configuration of the Metropolitan Activity Areas is therefore a combination of nodal and linear, linked to the movement system. These Metropolitan Activity Areas are furthermore in different phases of development – some have already reached maturity or may even be declining, while others are only seeds of potential. Residential densification around the Metropolitan Activity Areas is one of the strategies to ensure the viability of these areas and promote a public transport system.

The **Movement System**, based on road, rail and air, is proposed as a structuring concept to:

- Support public transport;
- Promote accessibility of communities to employment, recreation and social opportunities;
- Protect the mobility function of major arterials and roads;
- Ensure economic competitiveness; and
- Ensure that the movement system directly links with, and is supported by, strong high intensity nodes and higher density residential developments.

Proposals are made for improving the inter- and intra-city movement, both in terms of road and rail networks.



The **Environmental Structuring Concept** relates to:

- Creating a network of open spaces;
- Protecting important environmental areas; and
- Support sustainable urban development practices.

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.

This concept supports the identification and linkage of metropolitan open spaces and provides a framework for the integration and enhancement of our cultural heritage. The vision and concepts from the Tshwane Open Space Framework, currently being finalised, is integrated into this concept.

The **Urban Lattice Concept** contributes to city structuring by:

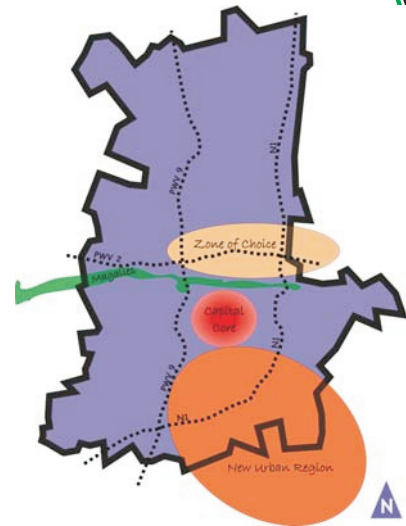
- Creating various opportunities for development and growth around the movement system and urban nodes;
- Supporting efficient service provision;
- Integrating the city by creating linkages between areas; and
- Support public transport.

### **Implementing the MSDF**

The MSDF provides a mechanism to focus the municipality's attention spatially and provides a **framework for discussion**. The Spatial Development Concept provides guidance with regards to the desired urban form, and identifies focus areas for development structured around Metropolitan Activity Areas and the movement systems throughout the city.



The City Development Strategy (CDS) and City Vision provide the context for the alignment of priorities within the city, with their focus on development of the North and the prominence of the Capital City. One other very important aspect is the emergence and consolidation of the new urban region of Gauteng as core of the economic heartland of the country, as illustrated in the diagram. In terms of this, Tshwane identified three opportunity zones, namely the Zone of Choice, Capital Core and the New Urban Region, illustrated in the accompanying diagram.



Conceptual Urban Opportunities

These three urban opportunity zones provide a context to inform strategic decision making in terms of spatial priorities in the city. Notwithstanding ongoing projects to maintain the city, or address service backlogs, these three areas represent the areas where the city will benefit the most over time if strategic investments are concentrated here. The character and purpose (function) of each of these three zones are different and unique, and call for tailor-made strategies and interventions to facilitate and guide their development and growth.

In order to encourage desirable land uses and built form in strategic locations as identified in the MSDF, the following means should be considered / investigated:

- A package of incentives such as tax holidays, bulk service contribution rebates, high development rights, subsidies for housing, subsidies for public transport, etc.;
- Increased public investment (provision of additional infrastructure, rejuvenation of dilapidated or decayed areas);
- Provision of an efficient public transport system to support developments within these areas;
- Handling of development applications and other decision making processes related to development within the strategic areas should be particularly streamlined in order to encourage and facilitate development within these locations; and

- The development potential of all municipal owned land should be assessed as first priorities for infill development, unless the land forms part of the Metropolitan Open Space network. Institutional housing should be considered a first priority for suitable land and could be developed with public-private partnerships.

City Planning proposes the following Strategic Interventions and Focus Areas. This includes further planning work, such as local Spatial Frameworks and Precinct plans, strategies to facilitate private sector development such as incentives, and actual public sector investment in terms of infrastructure:

- Zone of Choice;
- Metropolitan and Urban Cores;
- Capital Core - Inner City Development Strategy;
- Tsosoloso programme;
- Urban regeneration projects and programmes;
- Programmes and projects to support the Densification and Compaction Strategy;
- Projects and programmes to develop the city in terms of the Tshwane Open Space Framework and Identity and Legibility Framework;
- Focus on a viable public transport system; and
- Focus on Future Urban Development Areas.

### **Tshwane Open Space Framework (TOSF)**

The Tshwane Open Space Framework was developed in tandem with the MDSF and is considered a vital component to the Spatial Development Programme of the TIDP. The TOSF was approved by Council on 23 November 2005 and deals with all open space aspects on both the metropolitan and regional scales of the city.

The aim of the TOSF was to establish a thorough understanding on the intrinsic value of Open Space and to then develop a visionary roadmap towards the creation of an exceptional Open Space network for the city and its people.

The following objectives of the TOSF were identified:

- Create a detailed data and information base on all Open Spaces within the metropolitan area, including conservation areas and strategically important Open Space resources as noted within the Gauteng Open Space Plan and Gauteng Conservation Plan (C-Plan);
- Establish the status of the CTMM's Open Space resources as a vital and valuable physical and economic resource within the metropolitan region;
- Develop an Open Space Network based on a defined vision, classification/categorisation system and typologies on Metropolitan and Regional scale;
- Develop Principles and Policy Statements as a basis for consistent and integrated decision making by the CTMM regarding issues affecting Open Space resources on Metropolitan, Regional and Local scale;
- Provide Principles and Policy Statements as a basis for informing and guiding all scales of land use and infrastructure management on Metropolitan, Regional and Local scale;
- Provide an institutional, management and implementation framework to ensure the effective and collaborative management (planning and design, capital development and maintenance) of the Open Space Network;
- Inform the acquisition and disposal of Open Space; and
- Provide a Framework within which development activities within the city comply with the National Environmental Management Amendment Act, 1998 (Act 107 of 1998).

The TOSF consists of three volumes:

- Volume 1: An analysis of the current Open Space situation within Tshwane.
- Volume 2: Open Space Vision, Policy, Metropolitan and Regional Open Space Plans.
- Volume 3: Implementation Strategies (Alienation, Alternative Service Delivery, Open Space Development, Road Reserve Trees and Safety).



## **TOSF Volume 1**

Volume 1 addresses the following aspects:

- Firstly, the concept and importance of Open Space;
- Secondly, the guiding principles, as contained in relevant policies, that inform and direct the management and use of Open Space;
- Thirdly, the issues affecting Open Space, including urbanisation, ecological functioning, international competitiveness, image, economics, safety and health.

Volume 1 conclusions can be summarised as follow:

- A sustainable approach to developing Open Space is necessitated by international commitments, national legislation and provincial policies and initiatives. This forms the institutional framework in which the TOSF is developed. The TOSF needs to be positioned within a local institutional framework to ensure that it will be an effective decision-making and management tool.
- Urban growth places enormous pressure on Open Space systems. Urbanisation concentrates and thus compounds the environmental impact of human settlements. Pressure generated by both high and low income development as well as sprawl and infill as well as existing inappropriate development rights threatens both the quantity and quality of Open Space.
- Past development patterns have been guided primarily by ideological and short term financial concerns, while externalising environmental costs. Political will should take social and environmental concerns into consideration to ensure sustainable development.
- The environmental goods and services rendered by Open Spaces are vital to ensuring current social and ecological well-being, future sustainable development and long term survival. Tshwane possesses exceptional Open Spaces with regards to biodiversity and representivity. The ecological integrity of Open Spaces is however compromised by ad hoc, non-responsive development.

- Open Spaces and their ecological and productive functions are undervalued and not fully understood.
- Conflicting values, aims and service delivery requirements with regards to Open Space functions exist between different council departments and negatively impact on the integrated management and integrity of Open Spaces.
- Well designed and maintained Open Spaces combined with high environmental quality, play an important role in ensuring an internationally competitive city and establishing a sought-after address for responsible investment. Tshwane's Open Spaces do not comply with international standards in terms of both quality and quantity. In addition to this, there is a large discrepancy in quality and quantity of Open Spaces amongst the different regions of the city.
- Open Spaces within the city are generally maintained to horticultural standards which do not distinguish between Open Space's primary ecological, socio-economic and placemaking functioning requirements.
- Existing Planning Ordinances which to this day, still direct Open Space provisioning, were developed in the 1980s. They were developed mainly for low density, affluent communities and without any consideration of the internationally accepted concept of "sustainable development". Their directives fail to address the disparities, complexities and challenges of the current realities facing cities and especially Tshwane's dual city.
- Limited finances and resources are available to develop and maintain Open Spaces, yet the pressure on Open Spaces is constantly increasing.
- Funds generated through Open Space alienation and contributions are not ploughed back into the development of existing or new Open Spaces.
- The large amount and visibility of Open Spaces within the city are critical to the image of Tshwane reflecting "nature within a city" and "city within nature".
- To fulfil the capital city vision, Open Spaces have to be better structured, sufficiently funded and properly managed to ensure a high quality public environment. There is potential to expand the capital city image outside of the capital core through the creation of placemaking elements such as gateways, boulevards and civic squares.
- Open Spaces play an important role in the economic well-being of the city through activities such as tourism and urban agriculture. Tshwane's Open Spaces are the main tourism attraction in the city. This potential could be further enhanced. The role of urban agriculture should be actively explored.



- The valuation of Open Space resources do not take into consideration the social and ecological (environmental goods and services) value of the resources.
- Safety and security concerns as well as negative perceptions towards Open Spaces lead to pressure for their alienation and closure. However international examples show through careful design and management, safety concerns within Open Spaces can be effectively addressed.
- Accessible, sufficient and well-designed Open Spaces are critical to the health and well-being of our residents. The recreational and socialisation needs of the residents of Tshwane are however insufficiently provided for, because of lack of funding and over-utilisation.

## **TOSF Volume 2**

Based on findings and conclusions of Volume 1, Volume 2 addresses the following aspects:

- Firstly, an Open Space vision is developed and unpacked into building blocks and principles (fundamental, structuring and composite);
- Secondly, the definition of and need for an Open Space network are discussed;
- Thirdly, different Open Space Categories are proposed and Open Space Typologies developed to enable the drafting of Metropolitan, Regional and, later, Local Open Space Plans;
- The conceptualisation of the Metropolitan Open Space Plan follows and the process followed in the conceptualisation highlighted;
- The conceptualisation of the 8 (eight) Regional Open Space Plans and the process followed in the conceptualisation is then provided for; and
- Lastly, Policy Statements based on the outcomes of the Metropolitan and Regional Open Space plans are developed for the Metropolitan, Regional and Local scales

### *Open Space Vision*

The vision for the city's Open Spaces is based on the city-wide vision, the CDS and the vision of the TIEP:

***'A sustainable Open Space network which provides the setting for the capital city, is of a high international standard, yet based in the African context, empowers the community to prosper in a safe and healthy environment, and protects the integrity of its ecological systems.'***

The vision was unpacked into Building Blocks and the implication for the proposed open space network explored.

### ***Open Space Principles***

With the advent of a democratic South Africa, planning has changed from programmatic to normative, meaning that it is underlain by principles in stead of quantitative standards. To this end specific principles underscore the TOSF Vision. These principles were applied from the Development Facilitation Act (DFA), the Constitution, GEAR (Growth, Employment and Redistribution Macro-Economic Strategy, 1996), the Reconstruction and Development Programme (RDP), NEMA (National Environmental Management Act, 1998 (Act 104 of 1998) and the TIEP (Tshwane Integrated Environmental Policy). They are divided into three groups, namely: Fundamental, Structuring and Composite Principles:

- Fundamental Environmental Principles

Fundamental environmental principles guide all aspects of environmental resource management. As Open Space is the spatial manifestation, host and key contributing factor to the majority of environmental resources, the fundamental principles should inform decision-making on all aspects of Open Space.

- Structuring Principles

Structuring principles guide structuring of Open Spaces of the city. The proposed structuring principles relevant to the TOSF can be summarised as follow:

- i) Green structuring (Conservation);
- ii) Largest possible green space (Compaction);
- iii) Interconnectedness/ an integrated network (Connection); and
- iv) Placemaking.

- Composite Principles

Composite Principles guide the daily management of Open Spaces within the city. Management is understood as including aspects such as planning, capital development and maintenance. The aim of the Composite Principles is to facilitate sound management.

### ***Open Space Network Concept***

The development of an Open Space network is an integral part of shaping the city. Natural environmental resources are irreplaceable and should thus be one of the major structuring elements guiding the development of the city. Urban growth should not take precedence over Open Space; should not continue to destroy ecological sensitivities; should not ignore Open space's equal land use role in building liveable communities relegating it to mere "left over space" and "vacant land". The first step in shaping the city is therefore the determination of an Open Space Network, which contains not only ecological processes and systems, but also social value and placemaking opportunity.

### ***Metropolitan and Regional Open Space Plans***

The process followed with the drafting of the Metropolitan and Regional Open Space Plan was interactive. The metropolitan elements of the plan were first identified based on ecological functioning and importance and directives provided for by the MSDF. The identified elements of the Open Space network was transferred to a regional level at which these elements were verified and supplemented. The findings at the regional level were again fed into and cross referenced to the metropolitan level.

Of significant concern is the lack of Open Space information within the North West Provincial areas and the fact that very little information could be sourced from the North West Department of Agriculture, Conservation and Environment.



At Metropolitan level the ordered process entailed:

- The identification and mapping of all networks of metropolitan, ecological significance: Green Nodes, Green Ways, Blue Nodes, Blue Ways;
- The identification and overlaid mapping of areas that have already been compromised through development;
- The identification (with guidance from the MSDF) and mapping of metropolitan significant Brown Nodes, Brown Ways, Red Nodes and Red Ways ;
- The identification and mapping of Grey Nodes and Grey Ways;
- The verification of the above during the compilation of the Regional Open Space Plans; and
- The updating of the Metropolitan Plan in response to the conclusions of the Regional Open Space Plans.

On regional level several quantitative analyses of the ecological and socio-economic functioning of Open Space were done in order to determine:

- The percentage land with medium and high ecological value (based on the GIS Pair-wise Comparison Matrix Evaluation) compared to the area of land that is protected (based on GDACE database);
- The percentage land that is suitable for agriculture (based on the GAPA database) compared to the land actually used for agriculture (based on information collected on vegetation);
- The ratio of total CTMM managed Open Space (consisting of water courses, ridges, conservation areas, recreational parks, resorts and swimming pools, sports facilities, landfills, cemeteries, etc. from the CTMM database as well as GIS ridges information collected on vegetation types per 1 000 population. Surface areas for CTMM maintained watercourses, ridges, sport areas, road reserves, cemeteries and traffic islands were generally not available, especially so in the south-western and far northern part of the city;
- The ratio of developed Open Space (consisting of recreational parks, resorts, swimming pool and sports facilities) per 1 000 population.



The ratios for total and developed Open Space were compared to the following international standards:

- 2,4ha per 1 000 population for developed socio-economic Open Space.

The Regional Open Space Plan drafting process entailed:

- The mapping of all Open Space typologies of metropolitan significance as highlighted in the Metropolitan Plan;
- The refinement of ridge lines, based on existing development footprint and vacant land availability, where the 5 degree slope line was used;
- The identification of regional brown, grey and red nodes and ways, informed by such Open Space's sphere of influence, location, facilities, etc.;
- The identification of proposed nodes at the confluence of various typologies;
- The verification and confirmation of all proposals with Metropolitan Planning, Regional Spatial Planning, Parks and Horticultural Services, Nature Conservation and Resorts, Sports and Recreation technical experts and the mapping thereof;
- The recording of problem statements at the verification sessions; and
- The recording of Strategic/Catalyst Projects at the verification sessions.

### **TOSF Volume 3**

The aim of Volume 3 is to develop an Implementation Rationale for the visionary Metropolitan, Regional and still to be developed Local Open Space Plans. It details definite Implementation Strategies based on the findings of Volumes 1 & 2.

Volume 3 is structured as follows:

- Firstly the overarching institutional arrangements and management aspects of Open Space resources are proposed;
- Thereafter five identified and selected priority implementation strategies are discussed:
  - Open Space Alienation Strategy;

- Open Space Alternative Service Delivery Strategy;
- Open Space Safety Strategy;
- Road Reserve Tree Strategy; and
- Open Space Development Strategy.

