Section G
Public open space

The Neighbourhood Planning and Design Guide

Part II

Planning and design guidelines

Symbols at text boxes


More detailed information is provided about the issue under discussion


Important considerations to be aware of are highlighted


Relevant content from a complementing resource is presented

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Section G

Public open space

The Neighbourhood Planning and Design Guide

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G.1 Outline of this section

G.1.1 Purpose

Settlements (and neighbourhoods as the 'building blocks' of settlements) are integrated systems in which various components are interconnected, and this section highlights the role of public open space in this system. Public open spaces support a broad spectrum of activities and take on various forms. Open space performs important environmental functions and plays a key role in improving the health of communities.

Public open space refers to all publicly or privately owned land that is completely or partially open for use by the public. Some of these spaces may include buildings and other physical structures. The terms 'public open space' and 'open space' are used interchangeably in this Guide.

Public open spaces, along with housing, social facilities and engineering infrastructure, are significant neighbourhood assets that contribute to the creation of liveable and sustainable neighbourhoods. The aspects addressed in this section play an essential role in achieving the vision for human settlements outlined in **Section B**, and they relate in particular to **Section F** (Neighbourhood layout and structure) and **Section H** (Housing and social facilities).

G.1.2 Content and structure

This section (Section G) is structured to support effective decision-making related to the provision of public open space. The decision-making framework is outlined in Figure G.1, and the structure of this section is briefly described below.

Universal considerations

General aspects that should be taken into consideration when making higher level decisions regarding the provision of public open space are highlighted, including the following:

- The regulatory environment, including key legislation, policies, frameworks and strategies
- The key objectives that should be achieved as a result of the application of the guidelines provided
- Local or international approaches, mechanisms, concepts and current trends that could possibly be utilised to achieve the key objectives
- Contextual factors specific to the development project to be implemented such as the development type and setting

Planning considerations

Factors to consider when making more detailed decisions regarding the provision of public open space are outlined, including the following:

- The characteristics of the development, including the nature of the proposed neighbourhood, the anticipated number of residents and specific features that would have to be incorporated or requirements that would have to be met
- The existing features of the site and immediate surroundings (built and natural environment) as determined by the physical location of the proposed development

Outline of this section

- Options related to public open space that are available for consideration

Design considerations

Guidelines to assist with the design of public open space.

Glossary, acronyms, abbreviations and endnotes

A glossary, a list of acronyms and abbreviations, and endnotes (containing sources of information, explanatory comments, etc.) are provided at the end of Section G.

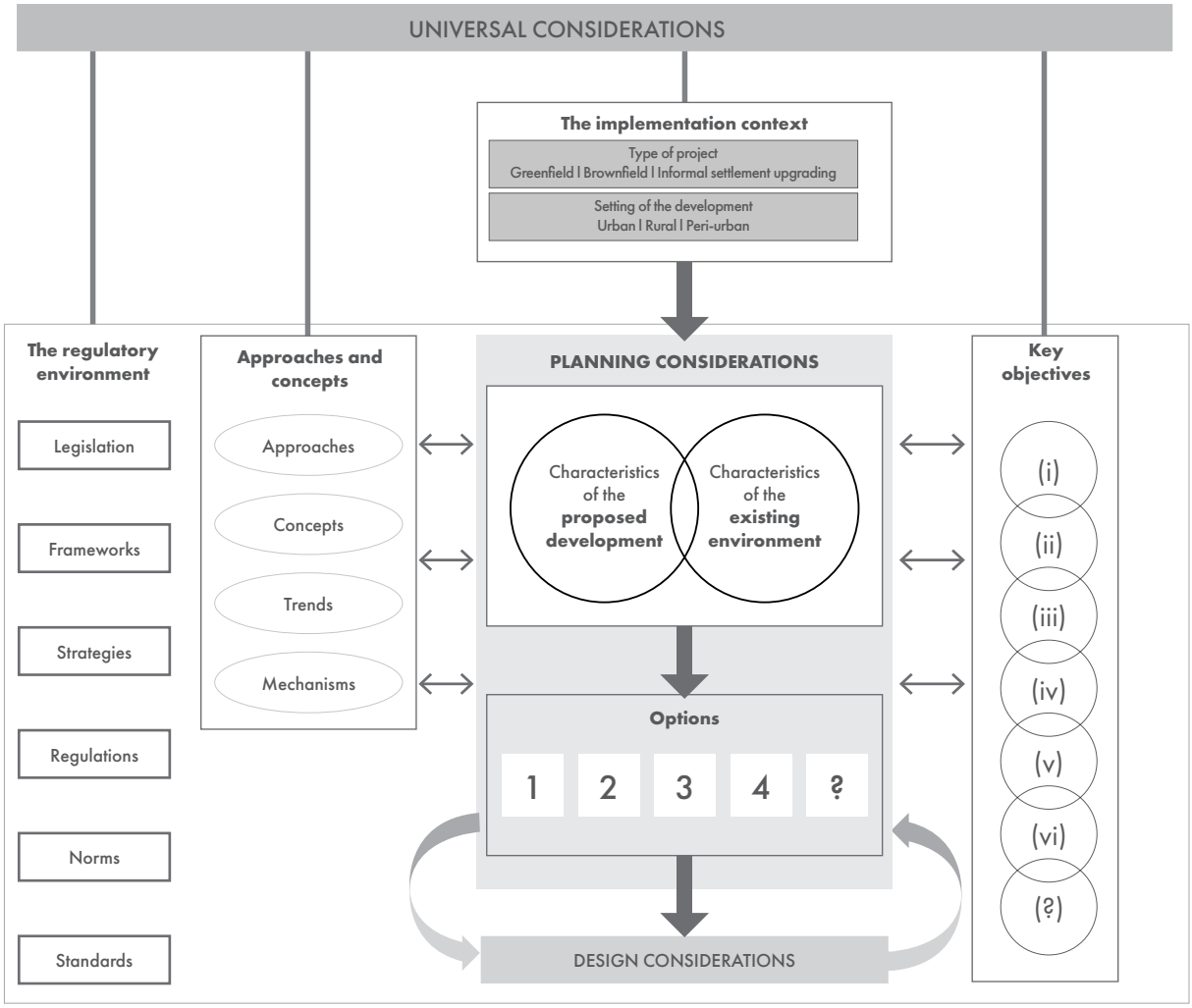

Figure G.1: A framework to assist with planning and design decisions

G.2 Universal considerations

G.2.1 The regulatory environment

The provision of public open spaces is not regulated by a single government department or located within a single sphere (national, provincial or local) of government. Legislation and policy that may have direct implications for open space provision are briefly outlined below. Since they are not discussed in detail, it is vital to consult the relevant documents before commencing with any development. (Also see Section D.1.)

(i) The Spatial Planning and Land Use Management Act, 2013

The Spatial Planning and Land Use Management Act (SPLUMA) is a framework act for all spatial planning and land use management legislation in South Africa. Among others, SPLUMA requires that national, provincial and municipal Spatial Development Frameworks (SDFs) be developed. Development principles, norms and standards as identified in SPLUMA guide all actions relating to spatial planning and the development or use of land, and each municipality has to adopt and approve a single land use scheme for its entire area.

Certain aspects addressed in SPLUMA relate directly to open space provision. Take note of the following requirements:

- Consider the municipal SDF when planning the project to ensure alignment with the SDF.
- Consider the municipal SDF when planning the project to understand the context of the project as depicted in the municipal SDF. Typical questions to ask include: What land use and densities are planned in the vicinity of the project? How will the project relate to the proposed developments in the rest of the municipal area?
- Adhere to the development principles (outlined in SPLUMA), namely spatial justice, spatial sustainability, efficiency, spatial resilience and good administration.
- Observe the regulations contained in the municipality's land use scheme regarding the use and development of land; the use, size and scale of buildings; and the intensity or density of land use.
- Adhere to the conditions of title as set out in the title deed of each property.
- If required, apply to the municipal planning tribunal to change the use, form or function of land; or remove, amend or suspend a restrictive condition.

(ii) National Environmental Management Act, 1998 (and its subsequent amendments)

The National Environmental Management Act (NEMA) is the framework legislation for environmental management in South Africa. Any new development should adhere to the national environmental management principles included in this act and comply with the environmental management regulations. Regulations published in terms of NEMA list activities for which Environmental Impact Assessments (EIAs) are required to evaluate the impact of human actions on the receiving environment. A distinction is made between Listing Notices 1 and 3 activities, which require a Basic Assessment, and Listing Notice 2 activities, which require a full EIA (scoping followed by impact assessment). The latter involves a systematic and comprehensive process through which detailed information is gathered on the social, economic and environmental consequences of proposed developments. The environmental authority uses this information to decide whether development applications will be approved. NEMA also introduced the development of Environmental Management Plans, which most municipalities are considering or requiring when compiling SDFs. Other acts that support environmental management at a national level include the following:

- The National Environmental Management: Protected Areas Act, 2003
- The National Environmental Management: Air Quality Act, 2004
- The National Environmental Management: Biodiversity Act, 2004
- The National Environmental Management: Integrated Coastal Management Act, 2008

Certain aspects addressed in NEMA relate directly to the provision of public open space. For instance, open space should be planned and designed in accordance with the environmental management principles contained in NEMA. Furthermore, the national register of all national, provincial and local protected areas should be consulted to determine their proximity to and possible impact on the project site.

Any intervention along a watercourse is subject to national legislation. The National Water Act, 1998 should be consulted in this regard and depending on the characteristics of the site and type of work being done, NEMA and its associated acts should also be considered.

(iii) National Heritage Resources Act, 1999

The National Heritage Resources act introduces an integrated and interactive system for the management of national heritage resources. According to the act, heritage sites, protected areas and heritage areas need to be taken into consideration when developments are planned (see Section F.3.2.1. (v)).

(iv) National, provincial and local policies, frameworks and guideline documents

For the planning and design of neighbourhood public open space, the domain-specific guidelines, policy, norms, standards and regulations of a number of relevant government departments (e.g. Public Works, Environmental Affairs, Water and Sanitation, and Rural Development and Land Reform) or entities (e.g. the South African National Biodiversity Institute (SANBI)) should be consulted. Several national government departments have guidelines aimed at the local level, such as the Department of Rural Development and Land Reform's *Draft Guidelines for the Provision of Open Space*[1] and the National Treasury's Urban Network Strategy toolkit.

At a local level, the planning mechanisms employed by municipalities need to be considered, including Integrated Development Plans (IDPs), Spatial Development Frameworks (SDFs), environmental management frameworks, land use schemes, green by-laws and dedicated open space guidelines.

It is important to take into consideration all goals, principles, spatial implications and guidelines contained in these documents when planning and designing the provision of open space.

G.2.2 Key objectives

Positively performing neighbourhoods – those that are generally regarded as successful and liveable – tend to have certain characteristics in common. These characteristics could be translated into a set of objectives to consider when decisions are made regarding the planning and design of public open space. A number of objectives should guide decisions regarding the planning and design of open space.

(i) Conserve and protect the natural environment

Neighbourhoods should contribute to stabilising global greenhouse gas (GHG) concentrations in the atmosphere and to protecting people from the impacts of climate change (see Section B.2). Neighbourhoods are dependent on healthy, functioning ecosystems to contribute to the creation of green, climate-safe settlements. Therefore, public open space should be planned and designed to enable ecological processes to occur sustainably and safely within environments that have been altered by human intervention. It is important that the ecological integrity of especially green open spaces, whether natural or cultivated, be maintained through careful stewardship, the protection of biodiversity, and by minimising waste. Where the disturbance of ecosystems cannot be avoided, the negative impact on the environment should be minimised.

(ii) Assimilate public open space into the surrounding neighbourhood

Public open space should be integrated into the neighbourhood and also into the broader settlement structure. The location of open space and its contribution to the layout and structuring of neighbourhoods are discussed in Section F.4.6. Public open space could be assimilated into the neighbourhood by considering the following:

- Public open space should be compatible with adjacent land uses. Each open space type (see Section G.3.3) will have different requirements for compatibility. For instance, a playground should preferably not be located next to a busy road, or, if this cannot be avoided, it should be planned and designed in such a way that the safety of the users of the playground is ensured.
- Public open space should be clearly demarcated. Demarcation does not necessarily mean that an open space should be fenced in or that some other form of physical barrier should be constructed along its perimeter. A change in land use could be indicated by various means, including a change in the surface treatment or by using vegetation to define the edge of the open space. Clearly defined open space that relates to the surrounding area in a welcoming way is usually better used. Blurred edges can result in confusion regarding management responsibilities of the space.

(iii) Promote accessibility for all

Public open space should be accessible to all residents of a neighbourhood. Where possible, these open spaces should be accessible by non-motorised transportation (NMT). In the case of certain types of public open space (e.g. regional parks or big sports complexes), close proximity to the existing public transport network is essential. People, whether disabled or not, should be able to use public open spaces comfortably and safely and, as far as possible, without special assistance. This accessibility requires a wide range of design interventions such as tactile paving, accessible toilet facilities, ramps, dropped kerbs and handrails (see Section O.2).

(iv) Respond to users' needs

Open space should respond to users' needs and requirements. Some needs are common to all user groups, while specific requirements could be ascribed to certain user groups, for instance young children who need secure play areas with good surveillance. Traders might need shelter and lock-up facilities. Spaces should be designed to create places that are 'fit-for-purpose' and useable. Needs may differ between the users of the various open space types, but common needs include the following:

- All users require a degree of comfort and protection from the natural elements, such as either a shady or a sunny place to rest.
- All users need to feel safe from crime. The design of public open space should aim to reduce the actual and perceived levels of crime and violence (see Section O.1).
- All users require spaces that do not pose a health risk or expose them to dangerous vehicular traffic.
- The design of open space should support easy maintenance of facilities and efficient waste management.

G.2.3 Approaches and concepts

This section briefly summarises possible approaches, strategies and mechanisms that could be utilised, or local or international concepts, ideas and trends that could be implemented to achieve the objectives discussed in Section G.2.2.

G.2.3.1 Water Sensitive Urban Design / Water Sensitive Design

Water Sensitive Urban Design (WSUD), an approach to urban water management that originated in Australia, is an approach aimed at managing the urban water cycle in a more sustainable manner so as to improve water security.[2] Within the South African context, WSUD is also referred to as Water Sensitive Design (WSD) to acknowledge the fact that the approach could be applied to settlements in general, not only to those in an urban setting.[3] The basic premise of WSUD/WSD is that water is a scarce and valuable resource, and therefore it needs to be managed wisely and with due care (sensitively). This approach encompasses all aspects of the water cycle and integrates urban design with the provision of infrastructure for water supply, sanitation, wastewater, stormwater and groundwater.

The purpose of WSUD/WSD is to reduce the negative impact of urban development on the environment and to enhance the sustainability of water. The intention is to, as far as possible, mimic the natural process of maintaining the water balance when planning and designing a neighbourhood or settlement. (See Figure G.2.)

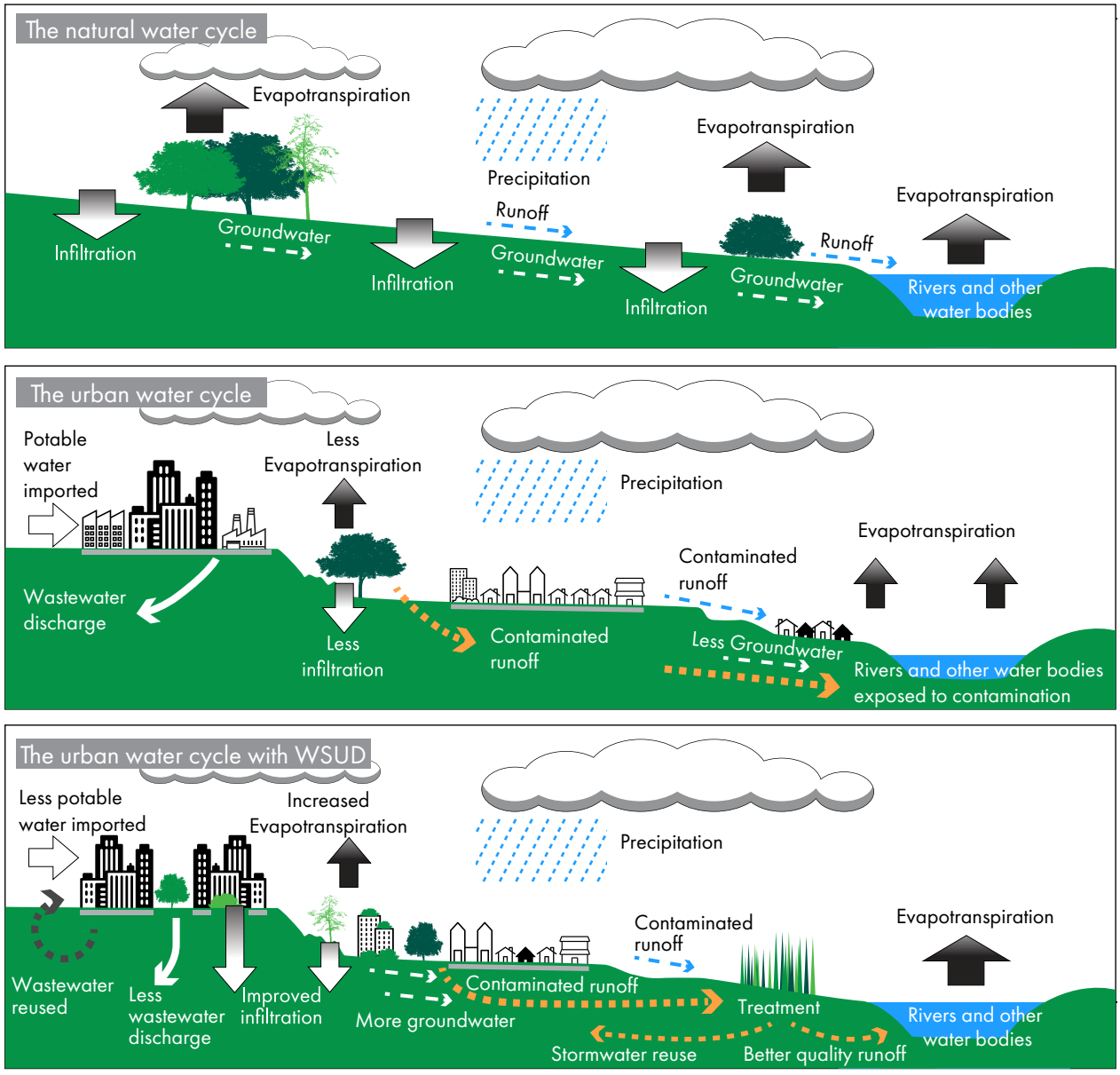

Figure G.2: The water cycle under different conditions

The natural process (water cycle) involves, among others, precipitation, evapotranspiration, runoff and infiltration. However, in a built-up area other components are added to the process. In addition to precipitation, potable water is imported into the area, wastewater is generated that needs to be discharged somewhere, and evapotranspiration is inhibited. Furthermore, because a substantial part of the area is covered with hard surfaces (buildings, streets, paving, etc.), infiltration of water into the earth is reduced while the volume of (poor quality) runoff increases.

WSUD/WSD aims to reduce the adverse effects of the built environment on water and to create settlements that preserve the natural water cycle. Strategies or interventions that could be implemented include the following:[4]

- **Sustainable Drainage Systems (SuDS)**. This is an approach to managing stormwater runoff that aims to reduce downstream flooding, allow infiltration into the ground, minimise pollution, improve the quality of stormwater, reduce pollution in water bodies, and enhance biodiversity. Rather than merely collecting and discarding stormwater through a system of pipes and culverts, this approach recognises that stormwater could be a resource. SuDS involve a network of techniques aimed at controlling velocity and removing pollutants as runoff flows through the system. This involves mechanisms and methods such as rainwater harvesting, green roofs, permeable pavements, soakaways, swales, infiltration trenches, bio-retention areas, detention ponds, retention ponds, wetlands, etc. These interventions can form a natural part of open spaces in a settlement and contribute to the quality of the environment and the character of a neighbourhood.[5]
- **Appropriate sanitation and wastewater systems**. Technologies that reduce water use, allow for the use of treated wastewater or recycled water, and minimise wastewater could contribute significantly to the effective and efficient utilisation of water resources in a settlement.
- **Groundwater management**. Groundwater should be regarded as a resource, and therefore aquifers should be conserved and protected from contamination and artificial recharge options should be considered where appropriate.
- **Sustainable water supply**. Various aspects should be considered to improve efficient water use and reduce the demand for potable water, including water conservation, water demand management, addressing water losses, and developing alternative water sources (e.g. rainwater, stormwater, wastewater and groundwater).

WSUD/WSD requires a multi-disciplined, holistic approach to neighbourhood and settlement planning and design. Various sections of this Guide relate directly to this approach, in particular **Section F** (Neighbourhood layout and structure), **Section G** (Public open space), **Section I** (Transportation and road pavements), **Section J** (Water supply), **Section K** (Sanitation), and **Section L** (Stormwater).

G.2.3.2 The street as open space

While movement remains the determining factor in the design of neighbourhood streets, these hard (paved) open spaces are also vital places where people interact, socialise and experience the neighbourhood. Pedestrian-oriented streets are streets specifically designed to prioritise pedestrians, such as 'woonerf' streets and arcades. Variations on the concept include streets that are closed (temporarily or permanently) and alleys or cul-de-sacs that are used for trading, markets, recreation and entertainment. Two of these concepts (woonerf and open streets) are briefly described below.

A woonerf is a type of street or group of streets that function as shared public space – for pedestrians (specifically children), cyclists and slow-moving cars. Originating in the Netherlands, the woonerf is often designed without traffic lights, stop signs, different lanes or even sidewalks, as the focus is on encouraging human interaction – those who use the space are forced to be aware of other users, make eye contact and anticipate actions. The woonerf gives NMT absolute right of way and requires motorised vehicles to drive at a walking speed. By requiring cars to drive slowly, the street is converted into an open space that can be used for a range of activities, including play, trade and exercise. The woonerf is mostly used in residential areas and the design often caters for attached or semi-detached housing that faces onto the pedestrian-oriented street. The woonerf concept is linked to the superblock street layout as discussed in **Section F.3.3.1**.

Photo credit: Ference Isaacs (R)

Figure G.3: Typical layout of a woonerf (L); a street closed off temporarily for community activities (R)

The citizen-driven initiative of 'open streets' (which originated in Bogota, Colombia) attempts to change how people use, perceive and experience streets. By temporarily closing off streets to motor vehicles, the open streets become public open spaces for a few hours or a day (often once a week or once a month). People, including pedestrians, runners, traders, skaters, and cyclists can use the space as they like. This temporary form of public open space can potentially add to the liveability of neighbourhoods by creating safe opportunities for interaction, trading and exercise.

G.2.4 The implementation context

This section highlights the contextual factors (specifically related to the type of development and its setting) that should be considered when making decisions regarding the provision of public open space. Also refer to **Section D.2.1** (Type of development) and **Section D.2.2** (The setting of the planned development).

G.2.4.1 The type of development

(i) Greenfield development

The location of open spaces on a greenfield site can be used as a structuring mechanism for neighbourhood layout. Certain areas of a greenfield site may include functioning ecosystems such as ridges, rivers, wetlands or areas worth conserving, and can then be accommodated in the neighbourhood layout from the outset. Within a greenfield development, the type of public open space will further be influenced by the needs of the anticipated residents, as well as the availability of open space in the adjacent neighbourhoods and the remainder of the settlement.

(ii) Brownfield development

Brownfield sites, by their nature, have limited space available for development, and allocating or retaining land for public open space is often a challenge. Existing open spaces (if retained) can be redesigned to respond better to the needs of the new (often higher-density) development. New open spaces can potentially be established on sites

that were used for something else in the past, for example by converting parking areas into a different type of open space, by establishing rooftop gardens, by rezoning road reserves (that are not used) and by rehabilitating unused landfill sites and transforming them into useful open space.

(iii) Informal settlement upgrading

Population densities in informal settlements are often relatively high, which means that the provision of public open space needs to be considered carefully. Dwellings (shacks) in informal settlements are usually relatively small and residents are often forced to use the public realm for a variety of everyday activities, including socialising, playing and doing laundry. Appropriate public open spaces should therefore be provided when such settlements are upgraded. If parts of an informal settlement are located on land unsuitable for development (e.g. areas within a floodline), it may sometimes be possible to utilise such land as public open space.

G.2.4.2 The setting of the development

(i) Urban

The urban areas of South Africa comprise a variety of settlement types. As urban areas have higher population densities and many people, the provision and design of appropriate public open space become critical. The open space to be included in an inner-city development will differ from that required in, for instance, a suburban setting. In an urban setting, due to shorter distances and more users, the relationship between different spaces is as important as the space itself.

(ii) Peri-urban

The development setting of peri-urban areas is diverse and includes a mix of settlement patterns, socio-economic statuses and access to services. Given the transitional nature of peri-urban areas, the nature of developments will vary considerably, and so will the type of open space to be provided.

(iii) Rural

Rural areas in South Africa comprise a variety of settlement types, including rural villages and towns, dense rural settlements and dispersed settlements. Development sites in rural areas will vary in nature depending on the location – for instance whether it is situated in a rural town or in a dispersed settlement. The type of public open space appropriate to the setting will therefore also vary. Due to the abundance of open space in many rural settlements, the open spaces in rural areas are often not focused on passive recreation (e.g. relaxation, walking, 'people watching'), but more on active recreation (e.g. sports fields and play areas for children). In some cases, the open space may be influenced by cultural considerations, the ownership of the land and tenure arrangements (for instance if it is managed by traditional leadership).

G.3 Planning considerations

This section deals with the planning of the provision of public open space. In this context, the term 'planning' means making informed decisions regarding the type of open space to be provided, based on a thorough understanding of the context within which the planned open space will be provided.

The decisions regarding public open space provision must be informed by a clear understanding of the features and requirements of the proposed project. This would require an assessment of the characteristics of the proposed development. Furthermore, the characteristics of the environment in which the new development will be located need to be examined and possible services and infrastructure that could be utilised must be identified.

This section outlines a range of questions that need to be asked and factors that have to be considered before deciding on the type of open space to be provided, and before the open space infrastructure can be designed.

G.3.1 Characteristics of the proposed development

Decisions regarding public open space provision need to be guided by an assessment of the characteristics of the proposed development and an understanding of the requirements or needs that will have to be met. Aspects that should be considered are discussed below.

G.3.1.1 The nature of the proposed development

The nature of the development that is planned will influence decisions regarding the provision of public open space. For instance, the provision of open space might not be necessary as part of a small development project, as residents' needs might be met by existing open space in surrounding neighbourhoods. Large (or mega) projects may have to include a range of open space types. The nature of a project therefore needs to be understood to make informed decisions regarding public open space provision. The following questions can be asked to gain clarity:

- What is the dominant land use of the proposed development? What supporting land uses will be present?
- What social facilities are planned? These facilities can often be clustered with other public facilities and located adjacent to public open spaces (e.g. squares, transport facilities or parks) to create service precincts.
- If a mixed-use development is proposed, what type of mix is proposed, e.g. a variety of housing types, sizes, densities and/or tenures? (See Section F.4.4 for a discussion of mixed-use developments.) The open space requirements of mixed-use projects will differ from projects that are primarily residential in nature.

G.3.1.2 The residents of the area to be developed

Decisions about public open space provision need to be guided by information regarding the potential residents and users of the planned open spaces. Usually, the identities of the actual occupants of the houses to be provided are not known when a residential development is planned and designed. It may be possible to make assumptions regarding the profile of the future residents and users of open space by assessing the surrounding neighbourhoods or similar developments in comparable locations or contexts. It is important to establish the following:

- The total number of residents that would have to be accommodated. Actual numbers may be higher than anticipated due to the fact that the provision of houses and services may attract more people than originally planned for.
- The number of households, the range of household sizes and the types of housing to be provided in the development. This will have an impact on the type and number of public open spaces to be provided.
- The composition of the potential user groups in terms of age, gender, income and levels of mobility. Young families, for example, need playgrounds for pre-schoolers. Public open space should, as far as possible, be accessible to all residents and users, whether they are disabled or not.

G.3.2 Characteristics of the existing environment

Decisions regarding open space planning and design need to be guided by an assessment of the context within which the development will be located. Issues that should be considered are discussed below.

G.3.2.1 The physical location of the proposed development

Constraints and opportunities posed by the development site could influence the planning and design of public open space. The physical characteristics of a site will influence the type of land use, buildings and activities that could potentially be accommodated within the open space.

(i) Landscape and ecology

The physical features of the landscape should have a substantial impact on the planning and design of open space, as (soft) open spaces perform ecological functions within a neighbourhood. These functions may include drainage, aquifer recharge, air and water purification, or maintaining biodiversity. Some open spaces are established to protect ecologically sensitive areas (e.g. nature reserves), while other open spaces may be developed on sites that are not suitable for conventional construction (e.g. some dolomitic areas).

A thorough analysis of the landscape and ecology should be conducted to determine the location and nature of all ecologically sensitive areas. Such an analysis will assist with site planning and influence the positioning (and ease of construction) of possible infrastructure and buildings. Gain an understanding of how the landscape is continuously evolving and changing, either through natural or human-induced processes, to assist in developing the site in the most ecologically sensitive manner. Gather information about the following:

- Wetlands, surface water bodies or other ecologically sensitive areas on or near the site. Information on Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) is available on the website of the South African National Biodiversity Institute (SANBI).[6]
- Endangered or protected plant or animal species on or near the site
- Existing vegetation, especially trees, and whether they are deciduous or evergreen, indigenous or alien
- Natural features that may have cultural significance
- The position of any telephone poles, overhead or underground power cables, rock outcrops, water features, dongas, etc. that could restrict building work or may require involvement (especially permission) from various government departments

(ii) Topography

The topography will be a key factor in the site layout and where possible buildings should be placed. It will also affect the views to and from the open space and the provision of engineering services. The following questions will assist in highlighting pertinent issues:

- Does the site slope? Are there significant changes in level, such as embankments or retaining walls? Gradients have an impact on the provision of facilities for pedestrians, cyclists and other types of NMT (see **Section I**). They also affect access for people with disabilities (see **Section O.2**).
- Can the development be oriented to make the most of attractive views?

(iii) Climate

The micro- and macro-climates of the site will influence the placing of facilities within the open space. The following questions need to be asked:

- Is the site exposed to prevailing winds? Is the wind direction seasonal? This information would assist in positioning and orientating (for instance) squares so that they are protected from the wind.
- Where does the sun rise and set in summer and winter? The availability of shade may be important to the users of the open space. Remember there may be external features that influence sun penetration on the site, such as a nearby mountain, hill, tree, or building.
- Does the site fall in a declared natural disaster zone? Is there a risk of seasonal flooding, earthquakes, tremors, veld fires and landslides? Do disaster management plans exist? For assistance with the development of actions to adapt settlements to the impacts of climate change, consult the *Green book: Adapting South African settlements to climate change*[7].

(iv) Geotechnical characteristics

Open space is sometimes developed on sites with challenging geotechnical characteristics that do not allow for extensive construction. These hazardous ground conditions can affect the proposed use or layout of the open space and present risk if some construction has to take place. The following questions need to be asked regarding the ground conditions on a site:

- What is the soil condition and quality?
- Are there any aggressive chemicals or minerals present?
- Is the site part of or close to a dolomitic area?
- Was the site used for mining and exploration in the past?
- Are there large rock outcrops on the site?
- Are there gullies or other ditches on the site?
- Is there groundwater present? What is the height of the water table?
- Did dumping – legal or illegal – ever occur on the site?

(v) Existing buildings on the site

Existing buildings on the proposed development site can be viewed as either presenting opportunities or constraints. In certain cases, existing buildings could be incorporated into the open space development. To determine the most appropriate course of action, the following questions can be asked:

- Do the buildings have features of historic or conservation interest? (See Section F.3.2.1.)
- Do the buildings have cultural significance? May these buildings be demolished?
- Should these buildings be refurbished? Can these buildings be repurposed and reused? Can these buildings be integrated into the new development?
- What are the character and form of these buildings? Should this influence the remainder of the development?

(vi) Adjacent land uses and edge conditions

Adjoining properties have an impact on each other. Therefore, it is important to be aware of the land uses adjacent to the development site, as well as the edge conditions that affect the site. Questions that need to be asked include the following:

- What are the adjacent land uses and how could that influence decisions regarding the type of open space to be provided? In particular, what types of open space are available or have been planned in the neighbouring areas?
- Are there neighbouring buildings where privacy needs to be respected?
- Are there unattractive neighbouring uses from which the new open space needs to be screened?
- Are there existing streets and spaces adjacent to the site to which the new open space should relate?
- Are there noise problems from road traffic, railways or adjoining buildings?
- Is there neighbouring vegetation that may have an impact on the proposed open space?
- Does a waterway run along the edge of the site?
- Are there neighbouring buildings that have cultural significance?

(vii) Access to the site

Residents and visitors should find it easy to access public open space. Open spaces should therefore link to existing pedestrian footpaths and routes and public transport facilities. Access to the open space should also be provided at safe and convenient points. The following questions could be asked:

- What is the vehicular traffic intensity of the streets adjacent to the proposed open space? Is it busier during certain times of the day? This might influence where the different uses and facilities are placed, and how vehicular access is provided to ensure the safety of pedestrians and other users.
- Where are the existing and potential vehicular, cycle and pedestrian access points to the site?
- Are there existing footpaths or other routes (desire lines) across the site? Can the existing footpaths and routes be accommodated in the new open space? The desire lines should be considered when designing movement networks as NMT users tend to follow established routes.
- Where are public transport facilities and routes located in relation to the site? How can these be linked to the proposed public open space?
- What are the local destinations (such as shops, schools, bus stops) that users of the new open space may want to access? How can the new open space best be linked to these to encourage walking and cycling?

G.3.2.2 Available engineering infrastructure and transportation facilities

The development of open spaces may not be as infrastructure intensive as many other land uses, but the potential impact on existing engineering infrastructure (e.g. water pipelines, electricity cables, sewerage pipes) should still be considered. Transportation infrastructure (e.g. streets, sidewalks, crossings, cycle paths) should cater for motorised

and non-motorised transport. To gain a thorough understanding of the existing situation, the following need to be established:

- What engineering infrastructure (bulk and local) is available close to the new open space?
- Does the existing engineering infrastructure have enough capacity to accommodate the demands (e.g. related to stormwater and sewerage handling) that will be placed on it as a result of the development of new open spaces in a neighbourhood?
- Can the new open space be linked to existing engineering infrastructure?
- Are there public transport routes close to the site? Are there bus stops, railway stations or taxi ranks close to the site? Is there sufficient public transport capacity in the area?
- Are there cycle and pedestrian facilities available?

G.3.2.3 Existing socio-economic features

The planning and design of a development must be guided by the potential needs of the residents of the new and existing neighbourhoods. If an existing community will move into the proposed development, it is critical to understand the community and involve them in the decision-making process from the outset. (See Section E.) It is also important to acquire information regarding the socio-economic features of the neighbouring communities. This will provide some indication of the types of open space that may be required. The following questions should be asked with respect to the existing community (if known) and the adjacent neighbourhoods, especially those that are functionally linked to the development:

- How many people live there? This information can be used to assist with determining how much space should be provided per 1 000 people for a specific type of open space (see Table G.1).
- What is the age profile of the residents? Residents at different life stages may have different needs regarding open spaces.
- What is the income profile of the residents? Do residents have access to private cars? This will inform decision-making on issues such as the provision of parking.
- What types of housing are people living in? Some housing types (see Section H.3.3.2 for a housing typology) e.g. single detached housing or semi-detached housing often have gardens (of varying sizes) and residents may not use public open space frequently. Attached housing and apartments or flats usually have some semi-private space (e.g. courtyards), but in general, outside living spaces, yards and garden areas are limited. These residents may use public open space more frequently than people living in single detached or semi-detached housing.

G.3.2.4 Legal / administrative considerations

Legal issues relating to the site can influence the development and may cause considerable delays if not dealt with pro-actively. For the development of different types of open space, it is important to consider the zoning of the development site as it might be necessary to apply for a rezoning, a consent use or another departure from the scheme (e.g. through a building line relaxation) to accommodate the proposed development. In addition to the zoning of a property, conditions in the title deed or in the township establishment scheme or the presence of servitudes may influence decisions regarding the provision of open space.

G.3.3 Public open space options

Open spaces are often described as soft (green) or hard (paved) open spaces. Many open spaces include both soft and hard elements, but in most instances one of the elements would be more prominent. Open spaces can be classified into different types based on specific (mostly functional) characteristics. The different types can be grouped together in a number of ways according to various criteria, but for the purpose of this Guide the different types of soft open space have been categorised as follows:

- Nature reserves
- Parks
- Sites for urban agriculture
- Sports fields

The different types of hard open space have been categorised as follows:

- Squares
- Streets
- Public transport stops
- Parking lots

In practice, these eight types may manifest in various forms, permutations and combinations.

G.3.3.1 Types of soft open space

Larger soft open spaces and remnants of natural areas should, where possible, be linked by corridors of green open space. These corridors can offer opportunities for recreational walking, jogging and cycling, which is not always possible in spatially isolated spaces. The corridors can also act as conduits for indigenous species, thus potentially facilitating the movement of small urban fauna, pollinators and the dispersal of seed from one space to another. The movement of pollinators and seed enables natural systems to be protected far more effectively than in the case of unconnected natural remnants.

(i) Nature reserves

A nature reserve is an area that is protected and managed in order to preserve a particular type of habitat with its associated flora and fauna. In land use schemes, this type of open space is often zoned for 'conservation' and it frequently includes river corridors (often developed as green belts), wetlands, aquifer recharge areas, and threatened and endangered habitats. This type of open space is usually open to the public, but human activity is often restricted to certain routes or areas within the open space. It is important that the frequency of visits and the volume of users do not reach a point where they compromise the environment and interfere with the natural functioning of the ecosystem.

Human intervention in these areas should be limited and primarily be aimed at the conservation of the natural area. Rudimentary facilities such as bird hides, viewing platforms and hiking trails along rivers allow residents to use the open space in a sustainable way. The locality, size and dimensions of this type of open space are largely dependent on the existing fauna and flora and will differ from place to place.

Photo credit: Pierre Victor

Figure G.4: Nature reserves in and around human settlements help to conserve the natural environment

(ii) Parks

A park is an area of open space (in a settlement) used for recreational purposes. Parks are usually owned and maintained by municipalities. Parks typically consist of lawns, trees and gardens, but may also have buildings, playground structures, ponds, fountains, monuments, etc. Distinctions can be made in terms of size and service catchment area (e.g. neighbourhood parks and regional/district parks) or in terms of shape and form (e.g. linear parkways/greenways, pocket parks and green wedges).

Neighbourhood parks (also referred to as community, precinct or local parks) serve the needs of the people living within walking distance of the park. Neighbourhood parks create opportunities for recreation (e.g. walking, meeting friends, picnics, playing games and informal sports) by offering amenities such as lawns, gardens, seating areas, pathways and playgrounds. Neighbourhood parks can also contribute to community cohesion by providing a sense of place for a neighbourhood, especially where it incorporates a significant feature of the landscape or a historic site.

Regional or district parks cater for the needs of the broader settlement. Regional parks are not only larger in size than neighbourhood parks, they usually offer multiple and diverse activities and amenities. In addition to gardens, seating areas, walking paths and lawns, these regional parks often include playgrounds, fitness trails, sports fields and picnic spots. Larger parks are sometimes able to accommodate events like craft markets, park runs, fairs and concerts. The parks are visited regularly by people who may not live locally and who use public transport or private motor vehicles to visit the park. These parks can also be successfully clustered with certain social facilities (see Section H.4.4) or co-located with other open spaces such as sites for urban agriculture. Sometimes drop-off facilities for recyclable materials (see Section M.4.3.5) or even buy-back centres (see Section M.4.3.2) are also located at district or regional parks.


Figure G.5: Neighbourhood parks can accommodate a range of activities

Playgrounds

Playgrounds are spaces specifically provided for use by children. These facilities usually form part of a park, or they could be combined with social facilities such as clinics, community halls or libraries. Where possible, playgrounds should be located close to primary schools or Early Childhood Development (ECD) centres to facilitate the sharing of facilities. Where playgrounds form part of a park or a social facility, they should be located relatively close to entrance and exit points (but away from busy perimeter roads) and traversing pathways, so that surveillance can be optimised.

The area and dimensions of a playground vary according to the nature of the play equipment and whether the playground is part of a park, another open space or a social facility. Playgrounds should nevertheless be small enough to enable easy supervision.

Requirements for play structures and playground surfacing are addressed in *SANS 51176: General requirements and test methods for playground equipment*[8] and *SANS 51177: Impact attenuating playground surfacing*[9].


Figure G.6: Playgrounds are often incorporated into a park

(iii) Sites for urban agriculture

Urban agriculture, urban farming or urban gardening is the practice of cultivating, processing and distributing food in or around a village, town or city. Urban agriculture can include animal husbandry, aquaculture, agroforestry, urban beekeeping and vegetable gardening. Sometimes referred to as productive open spaces, the sites are often specifically used for fuelwood planting, cultivation and harvesting of medicinal plants for traditional healing purposes, and grazing for livestock.

Sites for urban agriculture are becoming increasingly important due to concerns about climate change and sustaining food security in settlements. In addition, urban agriculture enables people to participate in the local economy and may also support cultural practices and the production of medicinal plants.

Urban agriculture initiatives are usually community based. Such open spaces may be within or close to low-income areas or accessible to the communities that are dependent on them. The size of this type of open space will vary, depending on the availability of suitable land, as well as the type of crop or livestock. Sites for urban agriculture are typically not open to the general public, but they could be combined with other social facilities such as education facilities or community centres.

Photo credit: Sibahle Community Projects

Figure G.7: Urban agriculture in a residential neighbourhood

(iv) Sports fields

Space used for organised sports can be provided in different ways. Five general types of sports facilities can be identified: stadia, fields, pools, courts and halls.[10] Certain types, such as fields and pools, can also be used for recreation (that is mostly not part of organised sports) such as walking, jogging and swimming.

It often makes sense to locate sports fields in close proximity to educational facilities or other sports facilities in order to facilitate the sharing of facilities between different user groups. Schools may for instance use the facilities during the day, while sports clubs can use them after hours or at weekends. The area and dimensions of such a sports field cluster vary according to the quantity and range of sporting codes to be accommodated, the space requirements of each sporting code, and the degree to which field markings can be overlaid to reduce space requirements. For specific field dimensions, consult the Department of Sport and Recreation's guidelines.[11]

Figure G.8: Various types of sports fields can be provided at community level

G.3.3.2 Types of hard open space

Hard open space (including squares, streets, public transport stops and parking lots) is a fundamental form-giving element in a neighbourhood (see Section F.4.6), but also provides opportunities for social interaction, economic activity and movement.

(i) Squares

Squares (sometimes referred to as plazas or piazzas) take on various forms in South African settlements. A square can be a large, paved open space with prominent buildings fronting onto the space and outdoor restaurants that are open throughout the day and evening. It may also have water features, informal traders and seating for workers during their lunch breaks. Local needs should determine the exact nature of the square to be developed, but certain universal characteristics can be identified.

Squares should be civic spaces to be used by local communities. Therefore, they are ideally located centrally in a neighbourhood where they are visible and easily accessible. Traditionally, town or city squares have held symbolic meaning as places of remembrance or celebration, reflecting shared community values. Squares are used for a

variety of activities, including trade, outdoor dining, roller skating, political rallies, meeting people and concerts. Retailing often forms an important component of hard open spaces and may include formal shops as well as permanent or temporary outdoor markets. Quite often, informal trading on neighbouring sidewalks or in nearby parking lots take advantage of the pedestrian traffic created by the activities on the square.

The use of a square may change during the course of the day, week and even the year. Facilities such as restaurants, cafés, cinemas and libraries with late-night hours should be encouraged to locate alongside squares to extend the usage of the square beyond office hours. The area and dimensions of a square vary according to the functions it is intended to perform, as well as the space that is available.

Photo credit: Roadie.co.za (L)

Figure G.9: Squares can take on various forms

(ii) Streets

Streets not only facilitate movement and access, they can also fulfil a range of other functions (see **Section F.4.1**). Streets make up a significant proportion of public space (especially in urban areas) and people often depend on streets for socialising, trading and recreation. (See **Section G.2.3.2**.) Therefore, streets should be safe places for everyone – for pedestrians and cyclists as well as drivers of motor vehicles (see **Section F.4.1.5**).

A focus on people

"A key ingredient of good street design is that it is designed for people, whether those people are driving, biking, taking the bus, walking, or pausing within their surrounds. Inviting streets must typically be safe and comfortable for users, and interesting as well. In short, the street itself must become a place worth going to."[12]

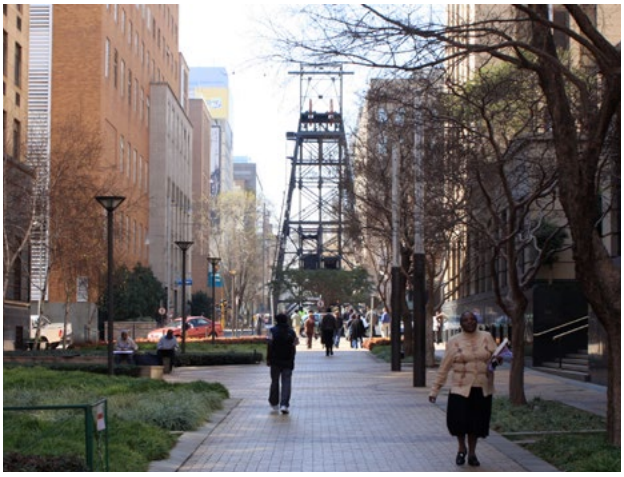

Photo credit: Annemarie Loots

Figure G.10: Examples of streets designed for people

(iii) Public transport stops

In South African neighbourhoods, public transport stops primarily include neighbourhood minibus taxi stops, neighbourhood minibus taxi ranks and bus stops (catering for municipal buses, Bus Rapid Transport (BRT) buses and others, such as long distance buses and Gautrain buses). These public transport stops should be located in places that are accessible to users (see **Section F.4**. for guidance on the role that public transport stops play in the layout and structure of neighbourhoods). The locations of bus stops are usually determined when bus routes are planned. Bus stops should be regarded as public open space and should therefore be carefully planned and designed.

Minibus taxi stops are usually not planned in advance and taxis often pick up or drop off commuters at undesignated spaces anywhere along the street.[13] However, as routes become established, stops become more permanent. Local minibus taxis also have a need for ranks or waiting areas during off-peak hours. These informal open spaces are often located near important interchanges or on the edges of neighbourhoods or simply where sufficient and conveniently located unused space is available. Unfortunately, the informal taxi stops and ranks are sometimes located at places that pose safety risks to the taxi drivers and their passengers as well as to other street users (including pedestrians, cyclists and motor vehicle drivers). Efforts should be made to engage taxi organisations in the planning and design of minibus taxi stops and ranks in neighbourhoods.

Often, minibus taxi stops become informal hubs, and the street in the immediate vicinity is transformed into a busy place where people gather. Passengers are exchanging between vehicles or between transport modes and these places usually have high pedestrian and vehicle traffic flows at certain times of the day. While some commuters may move on immediately, some have to wait for vehicles to pick them up. Provision should be made for people to queue and to wait comfortably. At taxi ranks, facilities for washing and cleaning of taxis may be provided. For more information as well as guidance regarding the planning and design of transport stops, consult the *NMT Facility Guidelines*[14] developed by the Department of Transport.

(iv) Parking lots

Parking for motorised vehicles can be provided in a number of ways, including on-street parking bays, parking garages and designated open air parking lots. Open air parking lots can be regarded as hard open spaces and should ideally be deliberately planned and designed as such. They can be located adjacent to shopping centres,

Photo credit: Gandhi Square Precinct, Johannesburg (L); Chris Kirchhoff (R) - www.brandsouthafrica.com

Figure G.11: Examples of different types of public transport stops

office blocks and public buildings. The size and dimensions of these parking lots would depend on the specific needs of the building or area that it serves and would be determined by the by-laws and land use scheme of the local municipality. Unused vacant land could also be used as open air parking lots.

Parking lots should cater for both vehicles and pedestrians. Walkways for pedestrians should be clearly designated and must be protected from vehicular traffic. Quite often, informal traders sell their goods in parking lots. The paving, vegetation (including trees to provide shade) and public furniture used for parking lots will contribute to the quality of the open space. Opportunities exist to use these large (usually) paved areas for services other than parking (e.g. for markets, gatherings or skate boarding and other games), especially after office hours or on weekends.

Photo credit: Shawn Greyling

Figure G.12: Parking lots can be used for a range of activities

G.3.3.3 Factors to consider when planning for public open space

Factors that influence the size and number of public open spaces to be provided in a particular neighbourhood or settlement vary depending on the type of open space. For instance, decisions regarding the provision of nature reserves are usually informed by the presence of environmentally sensitive areas rather than, say, the number of possible users, as in the case of certain parks. When making decisions regarding the size and number of parking lots, other factors would be considered, such as the specific needs of the buildings or areas that they serve, and the by-laws and land use scheme of the local municipality. However, in general, open spaces should be placed throughout a settlement in such a way that they can be shared equitably by all residents. A number of issues would usually guide decisions in this regard, as discussed below.

(i) The availability and capacity of existing public open spaces

Residents not only use public open spaces that are located within their own neighbourhoods, but also public open spaces that are available in adjacent neighbourhoods or elsewhere in the settlement. Information on the number, capacity and location of existing public open spaces in and around the proposed development has to be considered (see Section G.3.2.1). The need to provide certain open spaces (e.g. parks, sites for urban agriculture, squares and sports fields) will in some cases be influenced by the presence or absence of open space in neighbouring areas and the capacity of these spaces to accommodate additional users.

(ii) The demographic profile of the residents

Another aspect that might influence the provision of certain types of public open space (e.g. parks, sites for urban agriculture, sports fields and squares) is the demographic profile of the residents of the area to be developed and of nearby neighbourhoods. Different groupings (e.g. retired people, families or single people) may use these open spaces for different purposes and they may even use them at different times of the day. A clear understanding of the differentiated needs that exist will contribute to open spaces that are appropriately designed to meet users' needs. However, the composition of the residents living in an area will change over time, with the demographic profile also likely to change.

Socio-economic status and income levels may have an impact on the type and location of parks, sites for urban agriculture, sports fields and squares. For instance, shorter travel distances to public open spaces should be prioritised in lower-income areas, as residents often have to walk (costs may prohibit them from using private or public transport) to gain access to these spaces. Certain open spaces e.g. sites for urban agriculture sometimes respond directly to the needs of lower-income communities and might be appropriate as part of such developments. People with higher incomes may select to use squares and sports fields provided by the private sector, even if these facilities are not conveniently located.

(iii) The needs of the community

If the future residents of a greenfield development are known, they could be included in the development process and could potentially inform decisions regarding the provision of public open space (see Section E). The residents of neighbourhoods surrounding a proposed development could also provide useful information to guide decisions regarding public open space. Information regarding open space needs may also be included in the municipal IDP.

(iv) Population density

Decisions regarding the provision of certain types of public open space are guided by the number of potential users in a particular area. The number and size of such open spaces can be calculated based on an estimated area (hectare) per 1 000 people. Estimated areas for parks are indicated in Table G.1. The number and size of these types of open spaces are therefore linked to population density (see **Section F.4.2.4** and **Section H.3.3.1 (ii)**). Generally, in areas with relatively high population densities, the size of certain facilities may have to be increased (compared to those provided in areas with lower densities), or more of the smaller facilities may have to be provided.

(v) Access distance

Access distance refers to the distance that people have to travel (usually from where they stay) to reach an open space. In some instances it is important to consider access distances, especially regarding open spaces such as parks, sports fields and squares. Guidance regarding ideal maximum access distances is provided in Table G.1. The area within the polygon created by these distances around a particular facility is regarded as the service catchment area. Access distances are influenced by a range of factors including the topography (e.g. flat or hilly terrain), street layout (e.g. permeable or impermeable for pedestrians), the availability of public transport, and the setting of the area (urban, peri-urban or rural). Parks, squares and sports fields that are accessed frequently by a large portion of the community should ideally be located relatively close to the target population to ensure short travelling distances and walkability (refer to **Section F.4.2.2** for a discussion on walkable neighbourhoods) for potential users of the space.

Access distance is not a determining factor in the location of all types of open space, e.g. nature reserves, public transport stops and parking lots.

Parks, squares and sports fields: Making decisions on the type, size and location

Detailed guidance regarding the equitable provision of various types of social facilities and public open space, such as parks and sports fields, is provided in the *CSIR Guidelines for the Provision of Social Facilities in South African Settlements.*[15]

The guidelines are supported by a web-based decision-making tool, the *CSIR Space Planner.*[16] Once a set of requirements (standards) for park or sports field provision has been agreed, this tool can be used to determine the impact of a specific development on the facility demand and to calculate the required space and facilities. Impact estimates are calculated for the range of facilities to be provided of specified capacity and the land area required for the provision of the said facilities.

For guidance on the application of differentiated provision standards in non-metropolitan areas (delivering parks and sports fields to rural areas), make use of the *Social Facility Provision Toolkit*[17] of the Department of Rural Development and Land Reform, which is populated with predefined standards. With this toolkit, demand can be calculated for any population size or for 1 328 predefined regional service catchment areas in South Africa for which population statistics are provided.

Table G.1: Sizes and access distances relevant to certain types of parks		
Description	**Ideal minimum provision/ 1 000 people**	**Ideal maximum access distance**
General provision Description	0.4 ha per 1 000 people	-
Neighbourhood park Small (optimum size of between 1 ha and 1.5 ha) landscaped open space serving the immediate local community/neighbourhood (within walking distance). These parks usually cater for informal recreation and often include play equipment.	0.3 ha/ 1 000 people	1.5 km or 20-minute walk
Community park Larger than the neighbourhood park (optimum size of 3.5 ha), this landscaped open space serves several surrounding local communities or suburbs. These parks generally cater for a wider range of activities.		2-3 km or 30-minute walk
Regional/District park Large, multi-functional parks (minimum site size of 2 ha) that meet the wide-ranging needs of the district/ regional community. These parks often preserve unique and extensive landscapes (an example is a botanical garden).	0.1 ha/ 1 000 people	10 km or 15-minute travel by public transport

Note: The provision ratios provided in the table above could be lowered if parks are clustered with sports fields. The general guideline for the provision of neighbourhood sports fields (excluding large facilities that cater for sports at regional or international competition level) is that the land requirement should not exceed 0.56 ha/1000 people. These sports fields should ideally have a maximum access distance of between 5 and 10 km.

While it is important to provide quality open spaces that meet the needs of the community, it is also critical to ensure that these spaces can be maintained within operational budgets over the long term. The quantity of improved open space (specifically parks) is sometimes emphasised at the expense the quality of the space provided. Generally it is preferable to provide the largest possible space within the specified distance to consolidate maintenance and operation efforts and costs.

Cemeteries

Cemeteries are usually zoned as public open space that is set aside for burial purposes. Decisions regarding the sizes of cemeteries and their distribution throughout the settlement should be coordinated at a municipal level. For a method to calculate cemetery site sizes and guidelines about population thresholds and access distances to be considered in the planning for cemeteries, consult the *CSIR Guidelines for the Provision of Social Facilities in South African Settlements*[18] and the *Social Facility Provision Toolkit*[19] of the Department of Rural Development and Land Reform.

Conventional cemeteries take up large tracts of land and municipalities often have difficulty finding land that is both available and suitable for this use. An Environmental Impact Assessment (EIA) is mandatory for the establishment of a cemetery. One of the reasons why an EIA is required is because the decomposition of buried human corpses, the substances used to embalm the body, and even the materials used to manufacture caskets, could potentially result in water source contamination. Therefore, to determine whether or not a particular site is suitable for burial purposes, the following questions should be asked:[20]

- What are the soil and geotechnical conditions on the site? This is relevant as soils and underlying rock formations with, for example, high permeability or high moisture content might not be suitable for cemeteries.
- What are the groundwater conditions on the site? The water table should not be too shallow as a buffer zone is required between the bottom of the grave and the top of the groundwater table. Also, cemeteries should ideally not be located in areas of groundwater recharge or close to groundwater abstraction points. Both groundwater and surface water sources may become even more vulnerable in areas with high rainfall.
- Is the proposed site located within a 1-in-50-year floodline of a river? In general, cemeteries should not be located near any water bodies e.g. wetlands, pans, estuaries and floodplains.
- Does the site slope? Site drainage should ensure minimal ingress of surface water into the graves.

The most prevalent form of burial in South Africa is in-ground. This places a substantial demand on land, but alternatives, such as cremation or burying more than one family member in a grave, could reduce this demand. However, not everyone favours alternative methods, and other ways of reducing the need for land for traditional cemeteries, as well as the negative impact of cemeteries on the environment, should be considered. Concepts such as 'green cemeteries' or 'eco-cemeteries' should be explored, since they provide a more natural environment for burials, allowing them to also be used as a parkland or a natural habitat for animals. In these types of cemeteries, trees, stones and other natural materials are often used to mark graves rather than conventional tombstones.

For more detailed information, see *Good Practices in Cemeteries Management*[21], produced by the South African Local Government Association (SALGA). Refer to municipal by-laws for regulations regarding the procedures, methods and practices related to burial and the provision of grave plots in a municipality.

G.4 Design considerations

This section outlines the factors that need to be considered when incorporating open space into the design of a development. This section is closely linked to **Section F.4** that deals with the design of the street and plot layout of a neighbourhood. It is important to refer to **Section F.4.6** in particular when designing open space, since it provides more detail regarding the relationship between public open space and neighbourhood layout and structure.

As outlined in **Section G.3.3**, open spaces can take on various forms, including squares, streets, public transport stops, parking lots, nature reserves, parks, sports fields and sites for urban agriculture. There are significant differences between the different types and also between the different manifestations of each type. For instance, the nature and form of a park differ completely from those of a street, while the characteristics of a small neighbourhood park are not the same as those of a large regional park.

It is not the purpose of this Guide to provide detail guidance on the design of each and all of the different types of public open space. However, some level of detail is provided with respect to the design of streets, given their particular range of functions and links to other aspects of neighbourhood design. This information is provided in **Section F.4.1** and **Section I.4**. More information regarding the design of specific types of open space is also available in other guideline documents such as the *Draft Guidelines for the Provision of Open Space, 2017* [22].

A number of generic features have been identified that may be relevant to most types of open space, as well as certain aspects that would have to be considered when making design decisions regarding any of these features.

This section gives guidance regarding the design of the following generic features:

- Edges and interfaces
- Access and movement
- Surfaces and vegetation
- Public furniture and amenities

When considering the information provided below, it is important to remember that decisions related to the design of an open space should ultimately be guided by the characteristics of that particular open space and the surrounding area, as well as by local requirements and contextual features.

Designing inclusive public open spaces

When designing public open spaces and associated structures, fittings and furniture, care should be taken to create spaces that are as inclusive as possible. This means that such spaces should be welcoming and as accessible as possible to all people, including those with disabilities. More information is provided in **Section O.2**.

Sometimes certain open space components are designed to purposely and actively prevent or discourage certain residents from using a particular open space. This controversial approach is sometimes referred to as hostile or defensive architecture, or hostile design. It is usually aimed at vulnerable members of a community such as the homeless, but it could also negatively affect other people, including people with disabilities and small children. It is important to carefully consider the implications of design decisions aimed at preventing certain groups of people from using a public open space and to attempt to identify more inclusive alternatives.

G.4.1 Edges and interfaces

The boundary of an open space forms the interface between the open space and the surrounding urban fabric. The design of this boundary can influence how different land uses relate to each other. Public open space is often surrounded by private properties and the treatment of the interface between these properties and the public open space should therefore be considered carefully.

The quality of the edge between an open space and adjacent plots, or between different types of open space such as a park and a street, often plays an important role in the way in which the space is being used. In general, a clearly demarcated open space will improve the legibility of the space, which will assist people in orientating themselves and experiencing the space in a more positive way.

The edge or boundary of an open space could be defined or demarcated in various ways, depending on factors such as the local setting, the type of open space and the nature of the edge. The nature of edges could be determined by aspects such as land use, setbacks, parking requirements, access and visibility. Issues to consider when designing open space edges and interfaces include the following:

- Public open space should be integrated into the surrounding neighbourhood and, as far as possible, should not be physically or visibly isolated. This means that edges should be designed in such a way that they define the space without completely closing it off from adjacent spaces or limiting convenient access to the space. However, the degree to which a particular space is closed in and access is controlled will be determined by the type and location of that space.
- Ideally, spaces such as parks and squares should not be closed off or fenced in, to allow people to access and use the space unhindered. Walls and fences that restrict access may discourage legitimate users from accessing the space. This may result in the space being used for illicit activities and it becoming unsafe for those who want to use it for its intended purpose. It may also have a negative impact on the permeability of the neighbourhood (see Section F.4.1.1) and close off pedestrian routes, further reducing the number of casual users frequenting the space and thus limiting opportunities for natural surveillance (see Section O.1).
- In some cases there may be a valid reason why some form of fencing would be required and entrance and exit points may have to be limited, for instance to create a barrier between the users of the space and vehicular traffic in an adjoining street. Also, if a park is bordered by private houses, a secure fence separating the spaces may be required. In such instances a fence that allows for visual contact with and from adjoining spaces should be used if at all possible. Entrance and exit points should be positioned along the boundary in such a way that visitors can conveniently and safely enter and exit the park. Where applicable, the positions of the entrance and exit points should acknowledge pedestrian desire lines and public transport stops.
- For certain types of open space, the provision of a secure boundary and relatively few entrances and exits may be essential. For instance, it is often necessary to fence in sports fields, nature reserves, spaces for urban agriculture and parking lots for practical or security reasons. In such cases, solid high perimeter walls that prevent visual contact with and from neighbouring spaces should be avoided as far as possible. Blank walls facing the neighbouring spaces may create dreary or desolate areas that may not be safe for pedestrians or other people using these areas.
- The boundaries of soft open spaces such as parks can often be defined by means of the surface treatment. The horizontal surface of a soft open space may be covered with grass or other vegetation, and the adjoining space may have a hard surface (e.g. a sidewalk or street). Low fencing, shrubs or bollards could also be used to demarcate the edge.

- If buildings (whether public or private) are located on the perimeter of an open space, opportunities for natural surveillance (see Section O.1) from these buildings should be provided if possible. For instance, if a space such as a park or square is bordered by housing, windows should be provided in the walls facing the open space. Transparent fencing should be used between the open space and adjacent housing rather than solid boundary walls.
- Hard open spaces such as squares and streets can often be visually defined by placing vertical elements such as buildings or trees on the edges, thereby creating a 'sense of enclosure' (see Figure G.13). The interface between an open space and buildings facing the space should be designed with care to ensure that an active edge is created as opposed to a blank wall facing the space. An active edge can be created by providing frequent openings (exits and entrances) in the facades of the buildings facing the open space to encourage pedestrian activity as people come and go from buildings. If required, trees and shrubs could be used to soften the appearance of building facades. In the case of streets, the elements of the road reserve (see Section F.4.1.5) and the facades of the buildings along the street should be designed in an integrated way. Create an inviting and safe environment for people by clearly demarcating the sidewalk and locating activity generators such as shops, cafes, businesses and social facilities at ground level.

Photo credit: Mary Alexander (R) - www.brandsouthafrica.com

Figure G.13: Buildings and trees visually define the edge of a space and create a 'sense of enclosure'

The use of fencing

"The fencing-off of parks and similar open spaces is usually inadvisable. Barriers may deter legitimate users from entering, and reduce movement through these spaces, and thereby hamper natural surveillance. They may also provide a false sense of security since fences does not always prevent those with criminal intent from entering. It may often be sufficient to demarcate a specific area through the use of low, transparent fences, for instance to define a playground for children"[23] (see Figure G.14).


Figure G.14: Low fencing and elements such as bollards could be used to define a space

G.4.2 Access and movement

When making decisions regarding access to, and movement around and within, open spaces, the following should be taken into consideration:

- Open spaces can be linked to the surrounding area by extending neighbourhood pedestrian and cycle routes into or through the open space. Where applicable, entrances and exits, as well as routes through an open space, should acknowledge existing pedestrian desire lines. Care should be taken to ensure that vehicles, pedestrians and other non-motorised transport have safe access to an open space. Streets and sidewalks bordering the open space, as well as related intersections, pedestrian crossings and entrance and exit routes should be designed with care. For detailed design guidance on pedestrian crossings, refer to the Department of Transport's *National Technical Requirement 1: Pedestrian Crossings*[24] of 2016.
- Open spaces should be accessible to all users, including people with disabilities. The principles of universal design as outlined in **Section O.2** should be applied wherever possible. In particular, pathways within open spaces, and those linking such spaces to the surrounding area, should specifically be provided to accommodate wheelchair users, prams, pedestrians and cyclists (see **Section I.4**). They should be wide enough and the gradients should meet the requirements set out in Part S of the *National Building Regulations*.[25]
- Pedestrians and vehicles (including non-motorised transport) should be guided through an open space in such a manner that all users are safely accommodated, and where applicable, ecologically or culturally sensitive areas within the open space are protected. Movement could for instance be guided by means of pathways and by the positioning of lighting. The presence of lighting could direct users along safe and preferred routes, while the absence of lighting could discourage them from visiting certain areas at night and guide them along a safer route (see **Section G.4.4**).

G.4.3 Surfaces and vegetation

To select suitable vegetation and horizontal surface-covering material for different types of open space, various factors should be considered, including the following:

- The primary purpose of the open space will be a key determinant of the type of surface covering to be used. In some cases the choice would be obvious – for instance, parks, soccer or rugby fields would primarily have grass surfaces. Artificial (synthetic) grass is becoming popular for certain applications. However, before deciding on this option, the advantages and disadvantages should be considered. Be aware that artificial grass may not allow all rainwater to seep into the soil, it absorbs heat, and it could become very hot to the touch when exposed to sunlight.
- In areas where children may be active and perhaps fall, such as playgrounds, a surface material should be used that meets the specifications contained in *SANS 51177: Impact attenuating playground surfacing*.[26]
- Surfaces are often paved to provide the users of an open space with an area that is dust and mud free, especially in the case of transport stops, open parking lots, sidewalks, pathways, etc. Care should be taken to ensure that the surface material used does not pose a risk for people with disabilities or other users who may have mobility difficulties, such as the elderly. Certain paving material may be characterful and visually appealing, but they may make it difficult for these users to move safely and with ease. Where appropriate, material that assists users with disabilities to find their way should be used (see Section O.2). Paving material that allows for the comfortable movement of wheelchairs, prams, bicycles, etc. and tactile surfaces to assist those that are visually impaired, should be used where possible.
- Where possible, open space should be designed to support the principles of Water Sensitive Design (WSD) (see Section G.2.3.1). If appropriate, integrate public open space networks with stormwater management systems (e.g. retention ponds, aquifer recharge areas and open water canals). Permeable paving could be used to allow water to drain effectively, while vegetation swales and depressions may reduce runoff (see Section L). Open spaces should be designed and landscaped appropriately to ensure that they make a positive contribution to the environment and the surrounding community, and they do not become unkempt pieces of vacant land.
- Vegetation such as shrubs, trees and flowers should be suitable to the local habitat and climatic conditions. Select vegetation options that reduce water consumption, increase shading and can potentially adapt to climate change conditions, e.g. by having a wide temperature tolerance range. Minimise the use and reliance on potable water. Investigate options for rainwater harvesting, stormwater harvesting or greywater harvesting (see Section J.4.2).

Photo credit: Annemarie Loots (R)

Figure G.15: Vegetation could help to create open spaces that are interesting and inviting

G.4.4 Public furniture and amenities

Public furniture (also known as street furniture) refers to seating, waste bins, water features, lighting fixtures, etc. that are used in open spaces. The comfort of all potential users should be considered when decisions are made about the provision of public furniture. The following should be kept in mind:

- All public open spaces, in particular movement routes and areas where people would congregate (e.g. transport stops, parking lots and sidewalks) must be well lit at night to ensure the safety of users. Light fittings should be chosen according to the function they need to fulfil. For instance, low-level lights could be used to illuminate pathways, while certain parks or squares may require higher-level lights that illuminate large areas (see Figure G.16).

Figure G.16: Lighting can improve safety and can create a pleasant atmosphere

- In most instances, public furniture should be robust and the material used should be able to withstand the elements and being misused.
- Where appropriate, public furniture should be multi-functional. For instance, planters or bollards could be designed in such a way that they can double as seating (see Figure G.17).

Photo credit: Annemarie Loots (L)

Figure G.17: Public furniture includes bollards and planters that can also be used as seating

- Public furniture should accommodate the needs of different user groups. For instance, waste bins should be placed at a height that would allow children to use them. Furthermore, elements such as benches, waste bins and light fittings should be positioned in such a way that they do not obstruct routes taken by, for instance, pedestrians, cyclists or those making use of wheelchairs.
- In certain public open spaces, it may be useful to provide amenities for informal traders. Such amenities should be located carefully in areas where there would be potential customers (e.g. where there will be foot traffic or where people will congregate such as at a transport stop). If the amenities are not well located, informal traders will not make use of them and continue to trade where they know there will be customers.
- Streetscape elements should be aligned and visible and should not be in the way of pedestrians, cyclists or vehicles. For instance, if bollards or raised traffic islands are used, they must be either high enough to be visible to approaching drivers or be low enough that they cannot cause damage to vehicles driving over them.
- Toilet facilities in public open spaces should always be designed carefully to ensure that all users are safe and opportunities for crime are minimised (see **Section O.1**). The facility should be located in an area that allows opportunities for natural surveillance from the surrounding area, for instance by locating it close to areas with high levels of activity such as a restaurant or coffee shop. Entrances should not be hidden and ample lighting should be provided.
- Restaurants, coffee shops and similar types of amenities should be located and designed in such a way that they contribute to the creation of a safe environment. They are activity generators that increase opportunities for natural surveillance. If, for instance, a children's playground is located near a restaurant, it will be possible for the restaurant customers to keep an eye on those using the playground.
- In some cases, public furniture or amenities could be provided to attract visitors and thereby increase the number of people making use of a particular open space. For instance, a wishing well, water feature, robust exercise equipment or a skate park could be provided depending on the type of open space (see Figure G.18). This could have various benefits, for instance it could improve levels of actual and perceived safety and it could increase the number of shoppers or customers.

Figure G.18: By providing, for instance, exercise equipment or a skate park, people may be attracted to open spaces

Design to enable effective maintenance of public open space

Public open spaces should be regularly and effectively maintained to ensure that they remain in a functioning and useable condition. Unkempt, run-down or vandalised spaces create the impression that they are neglected and may have been abandoned by those responsible for their upkeep and management. This often creates the impression that such spaces are unsafe, which discourages legitimate users from using them. This may result in these spaces not being used at all, or they may be used for unauthorised activities rather than for the purpose initially intended. This may place a strain on the authority responsible for the open space and may negatively affect the surrounding neighbourhood.

It is therefore essential that open spaces are designed in such a way that they could be maintained relatively easily. This may mean, for instance, that materials should be specified that do not require regular, specialised or expensive maintenance. In particular, light fittings should be as durable and vandal resistant as possible (without being unsightly). Care should be taken when designing certain elements such as bins, gates and fencing to avoid them being removed to be repurposed or to be sold as scrap metal.

Figure G.19: Public furniture include lighting, benches and rubbish bins

Glossary, acronyms, abbreviations

Glossary

Biodiversity
The variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part. It also includes diversity within species, between species and of ecosystems.

Cultivated area
An area that is still perceived as predominantly 'green' but no longer in its natural state. It has been developed by human intervention for human use.

Desire line
An imaginary line linking facilities or places, which would form a convenient and direct route for pedestrians and cyclists. Desire lines become evident when watching people move through an area and they are often visible through informal footpaths across open space.

Ecosystem
A dynamic complex of animal, plant and micro-organism communities and their non-living environment interacting as a functional unit.

Habitat
A natural place or type of site where a specific species or organism occurs naturally. This area is characterised by specific physical factors such as soil, moisture, temperature range, availability of light as well as biotic factors such as the availability of food and the presence of predators.

Land use scheme
A land use scheme forms part of a land use management system that regulates and manages land use within a municipality. The scheme confers legal rights to properties to develop and to erect and use buildings subject to certain stipulated conditions. A detailed description of the content of a land use scheme is provided in Chapter 5 of SPLUMA.

Legibility
Legibility refers to the ease with which a space or a structure can be understood and navigated as a whole. People are therefore able to 'read' their surroundings. Legibility can be improved by providing physical elements that can serve as reference points.

Natural landscape
An area where biophysical processes and land features predominate over cultural elements. Few areas are totally pristine and all natural areas are in a dynamic state and to some extent involve contact with people.

Plot
A measured piece of land, also known as an erf, stand or site that is registered at the Deeds Office or forms part of a municipal land use scheme.

Rezoning
A colloquial description of the process of making an amendment to a land use scheme (or any of its provisions), to change the land use rights and development restrictions applicable to a specific property.[27]

Road reserve
A road reserve is a legally described area within which facilities such as roads, footpaths and associated features may be constructed for public movement. It is the total area between boundaries shown on a cadastral plan. It may also include an area alongside the road that may in future be used for expansion of the road width.

Sense of place
The sense of place of a neighbourhood can be described as the attitudes and feelings that individuals and groups hold towards the neighbourhood. Sense of place is therefore subjective, but useful generalisations can be made e.g. that some spaces, at least for most people who encounter them, provide an experience that is going to be unique, place-specific rather than generic. Places that have unique characteristics and histories are often considered to have a heightened sense of place. Layers of history, unique architecture or layouts, and place-specific signs and symbols help differentiate one place from another. But sense of place is not just about the physical environment, it also entails our perceptions of the positive social interactions that we partake in and those that we observe within a neighbourhood.[28]

Servitude
A servitude is a registered right that a person or an entity has over the immovable property of another person. It usually means that a portion of land is set aside for a specific purpose, such as road widening, or provision for engineering infrastructure (e.g. water pipelines, electricity cables, sewerage pipes). The municipality might for example have the right to construct electricity cables over a privately owned property. The property owner is then restricted in what he or she can do within the servitude. The servitude is attached to the property and will continue to exist even if ownership of the land changes. The servitude forms part of the conditions contained in the title deed and can only be cancelled by agreement between both parties.

Spatial Development Framework
SPLUMA requires all three spheres of government to produce Spatial Development Frameworks (SDFs). The focus of the three types of SDF differ. The national SDF provides broad strategic direction, provincial SDFs focus on the coordination of spatial development, and a municipal SDF contains detailed plans for the particular area of jurisdiction. Within the municipal sphere, the SDF forms a core component of the Integrated Development Plan (IDP) and guides the overall spatial distribution of current and desirable land uses within a municipality to give effect to the vision, goals and objectives of the municipal IDP. A detailed description of the content of SDFs is provided in Chapter 4 of SPLUMA.

Title deed
A title deed is a document from government that stipulates who the owner of the property is, the property's land use zoning and associated rights, as well as any restrictions such as servitudes, amended building lines, and area-specific conditions.

Universal design
The design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people, regardless of their age, size, ability or disability.

Wetland
The National Water Act defines a wetland as land that is transitional between terrestrial and aquatic ecosystems, where the water table is usually at or near the surface, or the land is periodically covered by shallow water that naturally supports vegetation typically adapted to life in saturated soil.

Zoning
A property's zoning stipulates the purpose for which the land may be used and is described in the municipality's land use scheme. The zoning also stipulates restrictions on the building erected on the property in terms of floor area ratio, coverage, density, parking requirements, etc. In order to change the purpose for which the property can be used, an application for rezoning has to be submitted to the local municipality for consideration.

Acronyms and abbreviations

BRT	Bus Rapid Transport
CBA	Critical Biodiversity Area
ECD	Early Childhood Development
EIA	Environmental Impact Assessment
ESA	Ecological Support Area
GHG	Global Greenhouse Gas
IDP	Integrated Development Plan
NEMA	National Environmental Management Act
NMT	Non-Motorised Transport
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SDF	Spatial Development Framework
SPLUMA	Spatial Planning and Land Use Management Act
SuDS	Sustainable Drainage Systems
WSD	Water Sensitive Design

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