Towards a more sustainable open space planning approach: George Municipality

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PREFACE

This dissertation was conducted on a parttime basis during my employment at the George Municipality. Most time spent on this paper was during the evening after work. Throughout this time assistance was provided from the municipality by allowing required study leave to be taken. General motivation was provided from different municipal officials including supervisors.

A special thanks would like to be given to my master's Supervisor Prof. J.E, Drewes for assistance in required information, overall document structure and always being available to assist.

Further assistance was provided by Stéfan de Kock my ISDG mentor. His assistance in my professional career development is beyond significant and regular follow up sessions provided motivation to steer forward and complete this paper.

Another individual contributing to the finalisation is my mother that provided mental motivation during late nights of writing this dissertation. Without her assistance in times of hardship the finalisation of this dissertation would not have been possible.

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ABSTRACT

Key terms: Urban structure, Intensification, Densification, Compact Development, Sustainability, Open Space and Multifunctionality

This research project seeks to explore the relationship between open spaces and how they are incorporated into urban development strategies. Open spaces refer to parks and recreational grounds while development strategies refer to intensification, densification, compact cities and sustainable development. As cities develop the incorporation of open spaces often decline due to neglected attention and planning of these spaces. The lack of criteria on how open spaces are planned for is also relevant. However, different factors play a role on how open spaces can be accommodated during the implementation of development strategies. The manner in which people perceive open spaces could lead to the decline in amount open spaces and usage. This paper assesses the form of urban areas and the role of development strategies. In depth analysis of open spaces related to their design and functionality follows. The paper seeks to determine which aspects contribute to efficient open space planning. Multifunctionality is one of the key aspects that contribute to open space efficiency. By understanding the key factors that make an open space functional possible planning and management guidelines can be drawn to assist in their development. These guidelines will potentially be able to satisfy the needs of communities living in surrounding urban areas. This paper will assess different case studies in order to determine guidelines for the planning of open spaces. These factors can then be compared to the study area's open spaces to evaluate their functionality. Recommendations are drawn from the factors evaluated in the literature and empirical research. Recommendations are of physical and legislative nature that are applied to the study area of George.

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CHAPTER 1 INTRODUCTION

1.1 Introduction

Cities throughout the world are affected by the pressure of urban sprawl, urban fragmentation and an increasing population. Densification and intensification strategies are implemented to lessen this pressure in a sustainable manner (An & Gu, 2018: 898). Such strategies are characterised by, higher residential densities, mixed land-uses, concentration of urban activities and prioritising transport efficiency (An and Gu 2018:898). In this movement to achieve urban efficiency the inclusion of open/green spaces may become neglected. Neglecting such spaces may lead to the decline of urban livelihoods for residents and the city. The focus of the proposed study will be to critically evaluate the inclusion of green spaces within intensification and densification strategies. The evaluation of academic papers clearly indicate that green spaces are threatened by densification/intensification strategies due to infill development on open/green spaces (Haaland and van Den Bosch 2015: 760). By identifying the importance and benefits of greenspaces in cities, these spaces can be effectively and sustainably incorporated within densification and intensification strategies. Cities that are experiencing rapid urbanisation and development may neglect the importance of open space planning in and around the city. This can lead to green spaces being used for infill development, becoming inefficient, or used for informal housing. By having a clearer understanding of the role that open space play in cities and in the lives of all their residents, open spaces can be successfully incorporated into development strategies. Integrating open space planning into development strategies the social, economic and environmental needs of residents can be functionally incorporated into the urban fabric.

The George area is characterised by its natural authenticity and garden city perspective. However, open spaces and the linkage between them has become neglected in the conquest for urban densification. This study aims to evaluate the existing and potential role of open spaces relating to the needs of communities living in cities. By understanding the role and need for green spaces more efficient policies, guidelines and implementation plans can be formulated for the integration of green spaces in densification policies. This report seeks to comprehend development strategies and propose possible implementation actions on sufficiently incorporating open spaces that are functional in an urban setting.

1.2 Background

During recent years, South Africa has experienced a mass migration of residents into cities that have resulted in development that may be inefficient and lower liveability. Liveability refers to “the

degree to which a place is suitable or good for living in" (Cambridge Dictionary 2022). Urban areas have become congested due to the increased need for housing, services and required facilities. As a result, development strategies are implemented to guide development more sustainably. However, a lack of attention towards open space development has become apparent in urban areas. Urban morphology forms the basis of all cities around the world (Kropf 2009:111). The layout of urban areas, their components, and the principles guiding their development are all included within the urban morphology. The urban form is controlled through development strategies that guide how development unfolds. In the 21st Century the focus on developing urban areas strives towards compact urban design to increase accessibility (Jabareen 2006:46). This assists in creating vibrant urban areas that provide necessary services to all residents, increasing their well-being.

The primary focus is, however, the optimal use of land within urban areas, and this optimal use could neglect the role of open space. Cities worldwide all have open spaces that form part of the urban environment. Open spaces refer to (i) public parks, (ii) natural undeveloped land, (iii) recreational grounds and (iv) the space between buildings (Faizi *et al.*, 2011:1). Open spaces contribute to the quality of life in cities, well-being of citizens and the integrity of the natural environment (Faizi *et al.*, 2011:1). The emerging problem regarding open spaces is the lack of criteria to plan for such spaces in development strategies. Criteria for the size, location and functionality of open spaces within the urban area are lacking (Maruani *et al.*, 2007:1). Underutilised spaces can be redesigned to form part of an open space system in cities that contribute to benefits for the communities living in these urban areas. Open spaces are present in most cities. Effectively incorporating open spaces in development strategies requires planning and management approaches that optimise their critical role and purpose in the community (Maruani et al., 2007:1).

This paper will focus on development strategies introduced in the George city area, located in the Western Cape Province of South Africa, and whether these strategies efficiently plan for incorporating open spaces. The use of open spaces within the city area will be evaluated to determine the benefit they hold for communities. In George, open spaces can be found throughout the urban area as green open spaces allocated for recreational use and some smaller areas in between the built environment. The George Municipal Spatial Development Framework, 2019 (GMSDF) emphasises the opportunity to integrate open spaces and reinforce their utility by connecting communities as some of these open spaces only exist and do not form part of an urban system to contribute to the needs of the communities in this area.

To fully understand and analyse data in this study, a mixed-method research methodology will be used. A mixed-method research methodology will acquire the needed data to assess how open spaces are used and how this data can predict future trends. The use of spatial analysis, observations and case studies will form part of this study.

Determining the role and function of these open spaces within George's urban morphology will be one of the key aspects of the research. To avoid future lack of guidelines and principles regarding the development and management of these open spaces, legislation and policies pertaining to their development will also form part of this paper.

Open spaces within an urban environment must be suitable for people to interact socially with strangers and provide recreational opportunities (Faizi et al., 2011:1). By determining the needs communities have regarding open spaces, the social aspect will become more apparent. Urban areas can benefit significantly from open spaces as they hold advantages for communities and the environment, which can be used to enhance the well-being of communities.

The natural aspect of open spaces contributing to the ecological functionality of cities will also be determined. These factors could include part of biodiversity within the urban area, reduce the impact of urban heat islands and mitigate the impact of climate change. This will assist in demarcating natural areas that should be protected against any form of urban development that can harm this natural environment.

In order to potentially provide recommendations for improvements of open spaces, the analysis of previous papers and articles will simplify how open spaces can be functionally incorporated into development strategies. Determining the functions that best suit an open space will increase efficiency and strive towards efficient development strategies and spatial management systems. Focussing on the advantages of having an open space system in cities may contribute to their incorporation into development strategies and optimise their functionality.

Further, this paper will determine the needs of communities, examine the legislation, applicable to open spaces and development strategies, and review case studies to determine how an open space system functions within the urban morphology.

1.3 Need

Neglecting the role of open spaces within urban areas may decrease the livelihood of residents and contribute to lower living environments (Jones 2002, 2002:48). Further, the ecological and natural functionality of cities is underpinned by the provision of the built environment reducing the availability of open space (Jabareen 2006:44). A lack of criteria, legalisation and development

strategies further reduces the provision of open spaces. Only once the full extent of why open spaces are required is comprehended can these spaces be functionally implemented within cities. An increased number of functional open spaces could lead to increased sustainability of urban areas and the implementation of more appropriate development strategies.

1.4 Research aims and objectives

This paper aims to provide recommendations and guidelines for incorporating open spaces into development strategies to achieve sustainable development in urban areas for all residents.

Together with the primary aim, the following research objectives are included:

- Determine the main components of urban morphology and the urban form.
- Comprehend the objectives of development strategies related to densification and intensification
- Identify the role and function of open spaces for communities and urban environments.
- Outline the connection between development strategies and open space provision
- Assess diverse legislation and policy documents to determine their role in guiding development in a South African context.

1.5 Research Questions

The research paper will further address the research questions that follow:

- How could open spaces be incorporated into development strategies?
- Will incorporating open spaces into development strategies be sustainable?
- Do policies exist that promote sustainable development through compact urban designs?
- What elements contribute to open space functionality?

1.6 Scope

This study defines the conceptual factors of cities, including components of urban morphology and historical development. The geographical- and environmental limitations that restrict urban development is to be demarcated. An in-depth scoping of legal implications and policies is to be evaluated for possible interventions related to development strategies. The health and safety of urban residents is to play a vital role in recommendations for increased functional development.

1.7 Chapter division

Table 1-1: Chapter Division

Chapter	Research Section	Title
1	Introduction	Introduction
2	Research methodology	Research methodology
3	Literature Review	Urban Structure and Land Use.
4	Literature Review	Urban Development Strategies
5	Literature Review	Open Space
6	Empirical Investigation	Empirical Investigation
7	Empirical Investigation	South Africa Planning Legislation and Policy
8	Empirical Investigation	Study Area: George
9	Findings	Findings of Empirical Research
10	Recommendations and Conclusion	Synthesis and Recommendations

1.8 Definitions

Table 1-2 below includes definitions of terms included throughout the dissertation.

Table 1-2: Glossary

TERM	DEFINITION
Urban Morphology	"Urban morphology is the study of urban forms and of the agents and processes responsible for their transformation over time. Urban form refers to the main physical elements that structure and shape the city including streets, squares (the public space), street blocks, plots, and buildings, to name the most important. " (Oliveira, 2016:5)

Sustainability	Sustainability means meeting our own needs without compromising the ability of future generations to meet their own needs. In addition to natural resources, we also need social and economic resources. Sustainability is not just environmentalism. Embedded in most definitions of sustainability we also find concerns for social equity and economic development (University of Alberta, 2013:1).
Multifunctionality	is a complex idea in urban landscapes which refers to the integration of different functions within the same or overlapping land units at the same time (Ling *et al*., 2007:286).
Development Strategies	means a land use strategy, development strategy or other land use planning document that identifies aspirations for future land use or development for an area/precinct (Law insider, 2022).

CHAPTER 2 RESEARCH METHODOLOGY

2.1 Introduction

Generally, research refers to obtaining knowledge for the purpose of understanding a specific topic. Research is defined as the art of scientific investigation to gain new knowledge. Research is applied in a technical sense related to an academic activity to define problems, create a hypothesis and possibly propose solutions. This paper will pursue data collection to verify existing knowledge and possibly contribute to making advancements in future research (Kothari 2004:1).

The following chapter provides an overview of the proposed research methodology and processes of data collection. Data collected and information acquired is for the purpose of achieving the research aim together with its objectives and to answer research questions. Ultimately the research aims to sustainably incorporate open spaces into development strategies. Identifying the factors that influence functionality of open spaces will assist in more efficient incorporation methods. Determining if existing legislation promotes the proposed incorporation methods will guide recommendations. The research methodology is followed by the limitations of the research and conclusion.

2.2 Research context

The literature review discusses and examines theoretical concepts in the field of urban planning, including (i) urban structure, (ii) development strategies and (iii) open space planning. New resources were identified and incorporated into the study using references and citations in the preliminary review of available academic papers. Main concepts were identified during investigation of literature and incorporated for possible clarification of theoretical terms. Strategies included in academic papers were researched and included according to possible relevance related to urban development strategies and open space functions.

Chapters six, seven and eight contain the empirical investigation based inductive research approach consisting of a mixed research methodology defined in further detail below. The inductive research approach allows for flexible research design to accommodate social realities (Liu, 2016:129). As social realities may change due to different circumstance the inductive research approach accommodates this factor (Liu, 2016:129). The empirical investigation further includes an exploratory research method for case study evaluation together with supplementary policy analysis.

Lastly, the research context includes the analysis section based on the linkages between the literature review and the empirical investigation. Findings included in chapter nine focus on the empirical investigation sections related to the case studies and legislative documents assessed. Thereafter recommendations were proposed on the basis of the previous conclusions. Recommendations include proposed suggestions that could contribute to the future of the urban planning profession. Recommendations are divided into two section namely physical and policy recommendations.

2.3 Research Paradigm

The research includes two paradigms, (i) Interpretivism and (ii) Critical. The Interpretivism paradigm is included in the empirical investigation to acquire data related to human behaviour and understand how open spaces are perceived by communities (Rehman and Alharthi, 2016:53). A cause-effect relationship exists between communities and the utilisation of facilities including open spaces (Dewar, 2002:212). An exploratory case-study approach is applied identify possible cause-effect relationships. Dependant variables related to different legislation levels are assessed to determine possible correlations in legislative documents. Finally, a Critical Paradigm is included in this dissertation's findings and recommendation chapter. The purpose of this paradigm is to suggest possible actions and policies to improve legislation, interpretation and

implementation (Rehman and Alharthi, 2016:57). Recommendations seek to strengthen the planning of open spaces on a local level when development strategies are implemented.

2.4 Methodological approach for empirical investigation

This study uses a mixed-method approach to gather and interpret the data collected. A mixed method approach is practical for using both quantitative and qualitative data (Johnson *et al*., 2004:15). Combined research methods will assist with complicated questions that a single set of data will not be able to answer (Johnson *et al*., 2004:15). This approach enables engagement with data from multiple perspectives. Johnson *et al*. (2007:113) describe this method of research as using information from both qualitative and quantitative research methods to find a middle solution for problems.

A mixed method approach will consider different opinions, perspectives, and situations to understand data fully. If a single research approach is applied, certain viewpoints might not be included in the study (Johnson *et al*., 2007:113). Creswell et al. (2003:163) agree with these statements that mixed-method approaches seek to use the advantages of both qualitative and quantitative research methods and eliminate the disadvantages. A mixed-method approach combines case studies and theories from qualitative data with surveys and experiments from quantitative data in a single study (Creswell *et al*., 2003:163). According to Cameron (2009:141), the mixed-method research approach allows the incorporation of transdisciplinary, interdisciplinary and multidisciplinary approaches within one research method. A broad spectrum of information and data addresses all relevant questions.

Different research designs for a mixed-method approach exist. The manner in which qualitative and quantitative data are organised and the primary data set that leads to the next is different designs of mixed method approaches. For this research paper, the qualitative and quantitative data are two study components. The mixed method design will follow a complementary research approach because this study's qualitative data is more than the quantitative (Cameron, 2009:144). A complementary approach is conducted when one of the data sets is more dominant than the other, in this case, the qualitative data set. The results of the quantitative data set will be used to clarify the findings of the qualitative data set (Cameron, 2009:144). This research method is an exploratory, mixed-method design that aims first to gather qualitative research and then support said research with the quantitative data collected. (Cameron, 2009:145). The final phase of the exploratory mixed method design is the integration of the data sets to establish a possible link (Berman 2017:1).

Case study investigation, which is included in the empirical section of this dissertation, is used as a data collection method to consider previous cases. An advantage of this methodology is providing a systematic method of collecting, analysing and concluding findings (Noor 2008:1603). This data collection method relates to the Positivist research paradigm to determine a cause-and-effect relationship between underlying principles. Through an exploratory research method restrictive and supplementary principles can be identified in case studies. A possible cause-effect relationship could be identified by means of evaluating previous examples. The cause-effect relationship could provide for efficient recommendations that avoid previous mistakes. In order to substantiate findings, form case studies, legislative document containing development strategies will be evaluated to provide supporting factors and information.

2.5 Research Constraints

Research constraints were observed throughout this dissertation and have been included in Chapter 10 below.

2.6 Conclusion

The research methodology for this dissertation provides a method of examining concepts contained in the literature review, analysing case studies and providing informative recommendations. Different research paradigms allow for more descriptive investigation methods.

CHAPTER 3 URBAN STRUCTURE AND LAND USE

3.1 Introduction

The following chapter will seek to define the core components of a city or, more specifically, the urban area that forms part of a city. By understanding the components that urban areas consist of, the characteristics of urban structure can be analysed. Urban structure is more commonly referred to as urban morphology, a term that will be further elaborated on below including research on associated components. Components of urban morphology could contain physical infrastructure, land uses, and zoning. The development of these components could be the result of historical urban development, while others form part of planning approaches and strategies for the future. Physical characteristics should be defined separately, focusing on their role and attributes. Zoning and land use form a separate section as these components relate more to town planning functions and future planning. Urban dimensions and natural landscapes will be briefly discussed due to their role in urban form.

3.2 Urban Form

Essentially, "urban form" describes the physical characteristics of a city or urban area (Dempsey *et al.* 2010:21). Urban form could also be defined as the spatial configuration of fixed elements (Dempsey *et al.* 2010:21). Tsai, (2005:142) agrees with this definition when stating that urban form is the "pattern of human activities at a certain point in time." The spatial configuration of fixed elements includes land uses together with their densities as well as the design of transport and communication infrastructure (William *et al.* 1996:9).

Urban form is established when people settle in an area and engage in using the surroundings for the purpose of establishing a community. These settlements consist of artificial components such as structures or land uses together with natural components (Dempsey *et. al.,* 2010:22). Natural components include mountains, rivers, valleys and vegetation. In contrast, artificial components are restricted to structures, places and routes (Sharma, 2014:11). Urban form may be determined by historical development patterns or the most current planning strategies (Dempsey *et. al.,* 2010:22). Planning strategies develop urban form by shaping activities through movement, access and storage (Crang, 2000:306). Dempsey *et al.* (2010:21) quote Williams when describing urban form as "morphological attributes of an urban area at all scales." Scales vary from building facades to the spatial arrangement of housing types, including their layout (Dempsey *et al.* 2010:21). Urban form is the configuration of all urban components at different

scales. Sharma (2014:9) touches on the quality of urban form and how it is affected by the different components relating to urban form.

Further, Sharma (2014:9) highlights the importance of planning strategies applicable to urban form and the city planners that develop these strategies. William *et al.* (1996:7) state that urban form is primarily affected by land use- and transportation policies. This implies that both the public and private sectors are responsible for urban form and the location of infrastructure, residential- and commercial activities (William *et al.* 1996:7). In a word, urban form can be defined as being evolutionary as building and infrastructure influences the configuration of new elements (William *et al.* 1996:10).

The figure below illustrates a schematic representation of the different components included in urban form. Although these five aspects only touch on man-made components, each component is affected by the influence of the natural environment. The surrounding natural environment affects the layout and density of urban form. Restrictive components such as rivers and mountains will severely impact the layout of urban form.

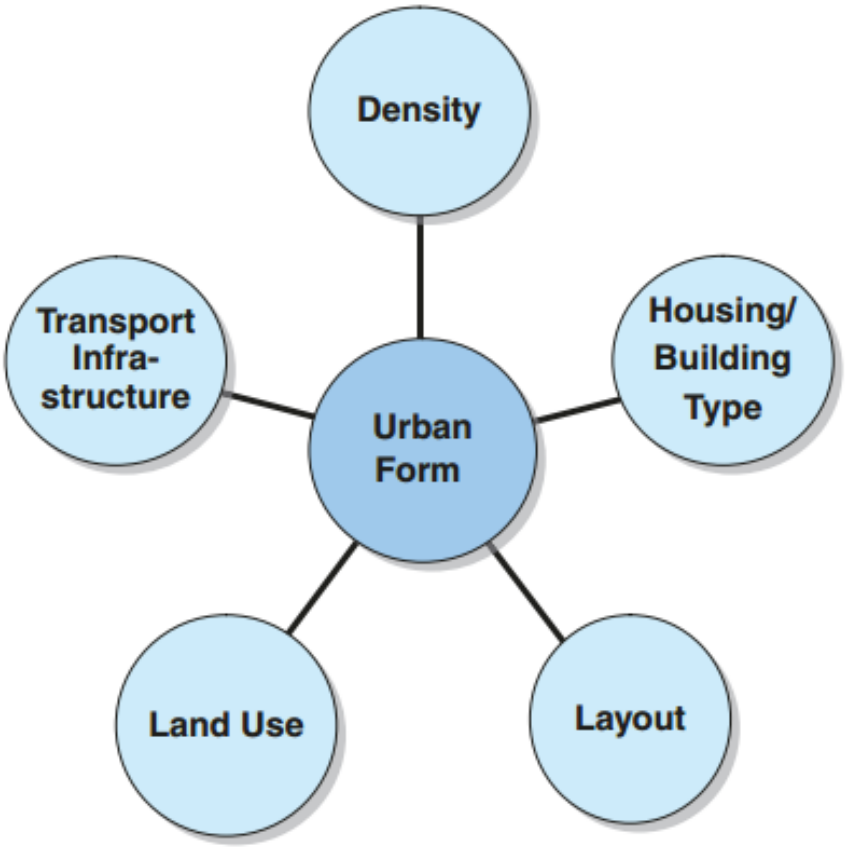


Figure 3-1: Elements of urban form.
Source: Dempsey *et. al. (* 2010:22)

Urban form has various implications for related urban factors, including the environment, services, and social- and economic functionality (William *et al.* 1996:9). Urban areas that have experienced the application of densification strategies may have lower energy demand due to the compact urban form. A more dispersed urban form, namely urban sprawl, is indicative of the loss of larger environmental areas due to development (William *et al.* 1996:9). Environmentally sensitive areas, farms and open spaces will be permanently transformed, leading to a negative impact on natural resources and biodiversity.

Urban form is not restricted to physical components as it includes non-physical aspects (Dempsey *et al.* 2010:21). Political, economic and social processes become apparent in the physical configuration of facilities, services, housing and parks. Culture plays a significant role in the development of urban areas and how their form is affected (Sharma 2014:9). With all the above considered, the urban form should be viewed as multi-dimensional, giving it a "personality" consisting of physical and non-physical elements.

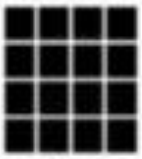
Shape	Street Pattern	Effect
	Rectangular or Chessboard	Streets are grid-like, with parallel streets intersected by perpendicular streets.
	Rayed	Streets that fan out at various angles from a given focal point and through less than 360 degrees.
	Radial	Primary thoroughfares radiate out from a central point. These streets may be extended outward 360 degrees around the central point or within an arc from a point along a natural barrier, such as a coastline.
	Radial-Ring	Loops or rings are surrounded by successively larger ones. Usually found in conjunction with larger radial patterns. Radial rings incorporate the elements of both radial and ring/concentric designs.
	Contour Forming	Pronounced terrain relief influences construction of roadways along lines of elevation. Primary streets run parallel to contour lines, with intersecting roads connecting them.
	Irregular Pattern	Irregular street patterns have been specifically engineered without geometric patterns for aesthetic or functional reasons. An American subdivision with curving streets and cul-de-sacs is an example.
	Combined Pattern	Any combination of the above and is best demonstrated by the development of high rise and business districts in Medieval or pre-Medieval cities.
	Linear Pattern	A primary thoroughfare radiates down the center with buildings on either side. American strip malls and main shopping districts are patterned this way for ease and convenience.

Figure 3-2: Urban space designs.

Source: Alvin Chua (2019)

Figure 3-2 illustrates the different classifications of urban form according to the street pattern. Later in this chapter, reference is made to different urban structure models such as the concentric, sector and multi-nuclei models. A clear comparison is evident between the shape of urban forms,

street patterns and urban structure models. For example, the Radial and Radial-Ring street pattern has an urban form similar to the concentric structure model. A centre point, possibly the Central Business District (CBD), that develops outward in a ring-based land use pattern.

Further, the Rayed street pattern illustrates the sector urban structure model. Triangular-shaped urban land uses that expand outwards from the central point (CBD). The multi-nuclei urban structure model represents an irregular pattern emerging from multiple central points created through time. As mentioned above, the rayed, radial, contour and irregular street patterns may be affected by the natural components of the urban form. These may components restrict the development of infrastructure, buildings and roads. A street pattern such as a rectangular or grid-like shape seems less affected by the natural environment as a parallel street pattern can be accommodated. The implementation of different street patterns will be further discussed in the Urban Morphological section below.

The following section of this chapter will seek to define and understand the term urban morphology. Defining urban morphology will allow the identification of separate components that make up the urban form. Lastly, the chapter will focus on the land uses and the zonings ascribed to different areas.

3.2.1 Urban Morphology

The study of urban morphology emerged in 1899 when a geographer, Otto Schlüter, envisioned the city as part of the broader landscape. Schlüter produced several maps of towns in European cities that represented the towns' historic cores and growth spatially (Whitehand 2007:2). The mapping of the historical development of urban form was referred to as the morphogenetic approach and became the primary feature of urban morphology (Whitehand 2007:2). The morphogenetic approach refers to the mapping of different physical forms included in urban areas (Whitehand 2007:2). From this point forward, several academics have studied the term urban morphology to understand its characteristics.

Urban morphology describes the physical composition and the characteristics that form part of any built environment (Kropf 2009:107). A definition by Larkham, as cited by Marshall & Caliskan (2011:412), describes urban morphology as an approach to theoretically understand the complexity of urban form. In a paper by Adolphe (2001:184), reference is made to urban morphology being defined as urban fabric comprised of the built environment and dimensions of the city. Urban morphology could be used to analyse the principles or rules of urban design (Gebauer and Samuels, 1981) cited in Marshall & Caliskan (2011:412). Kropf (2009:10) describes urban morphology as the tool that assists individuals in "reading" or understanding the urban form

of cities. This tool is used to identify characteristics and factors of a built environment to understand "human habitat" (Kropf 2009:10). Moudon (1997:3) agrees when stating that urban morphology is the study of the built environment as a human habitat. Different scales of urban morphology may be investigated to increase the depth of understanding of human habitat to determine the interrelationships between structure and character (Schirmer and Axhausen 2016:101). From investigation, two distinct aspects can be used to represent urban morphology: physical form and land use (Kropf 2009:108). Cozen, as quoted by Pinho & Oliveira (2009: 110), identifies three main elements of urban morphology, namely: the town plan, building fabric, and land use. The town plan is the city's topographical character comprising streets, plots and blocks (Pinho & Oliveira 2009: 108). The building fabric examines the three-dimensional composition of buildings and land uses, describing the utilisation of these buildings (Whitehand 2007:3).

Kropf (2009:109) categorises the primary approaches to examining urban morphology as (i) spatial analytical, (ii) configurational, (iii) process typological and (iv) historical-geographical. Marshall & Caliskan (2011:412) add spatial organisation investigation, a diagnostic of component relations and identifying types of urban form.

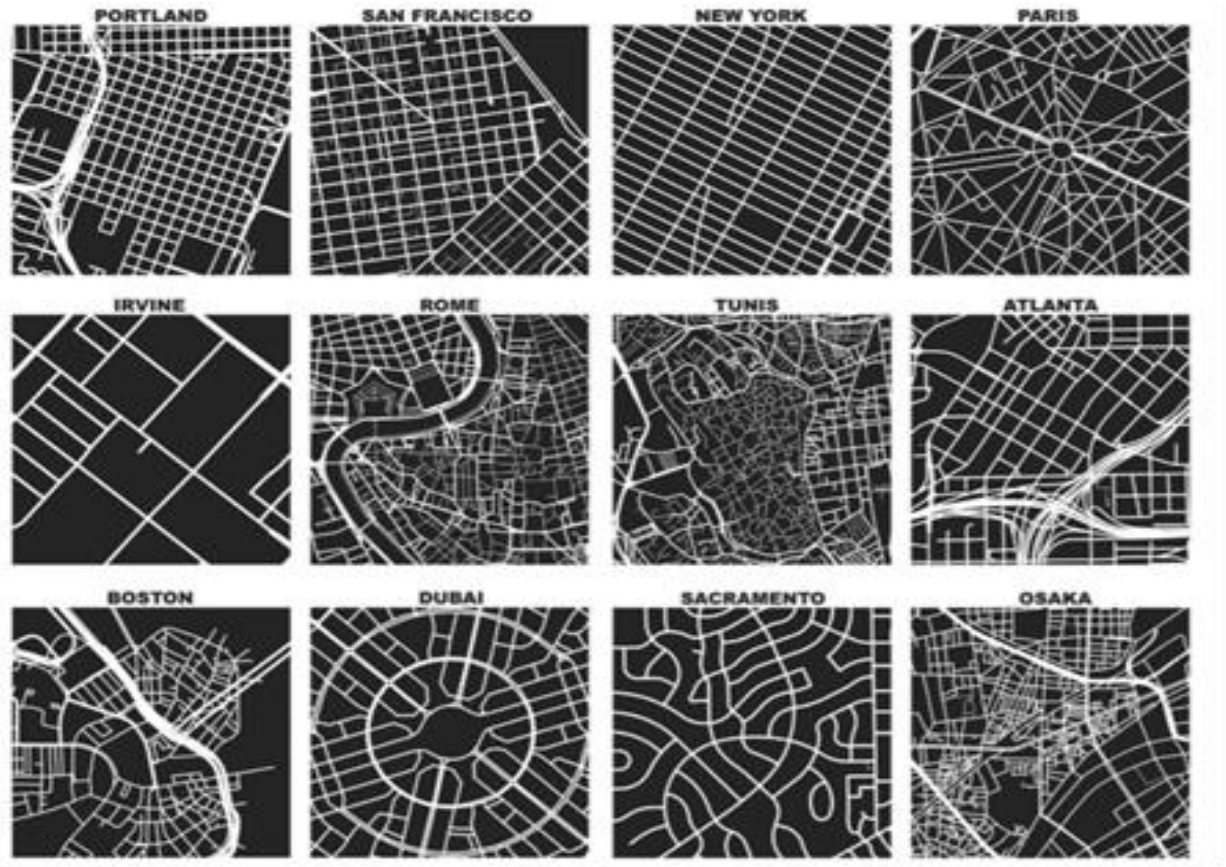


Figure 3-3: Layouts of urban form.

Source: Dempsey *et. al.* (2010:22)

Figure 3-3 illustrates the street networks of different cities around the world. Figure 3-2 above includes specific street patterns that are clearly illustrated in Figure 3-3. Different factors impact cities' street layout, including planning strategies, historical development patterns, natural components and urban structure. The following section will highlight a few examples to discuss the similarities between street network patterns, urban morphological attributes and urban structure models.

Tunis is the capital and the largest city of Tunisia. The city layout as indicated in Figure 3-3 provides a clear example of how the historic planning influences modern-day planning strategies. While the historic street layout illustrates an irregular street pattern, the surrounding area demonstrates the application of urban planning policies. A similar development pattern is noted in the capital city of Rome in Italy. An irregular historic street pattern is surrounded by a grid-like planning strategy following a more efficient urban form. Figure 3-4 below is the street layout of Tunis according to Google Maps. Note is to be taken of the historic street pattern on the left and the more recent grid-like street pattern on the right.

Figure 3-4: Tunis urban street layout

Source: Google Maps 2022.

New York, San Fransico and Portland in the United States of America are not affected by the historic urban form. A clear grid street pattern is evident in all three cities.

Lastly, the city of Dubai in Figure 3-3 illustrates a Radial-Ring development pattern due to planning strategies. Streets lead from a central point in concentric rings towards surrounding land uses and offer an example of a Concentric urban structure model that will be discussed below.

3.2.2 Components of Urban Morphology

The following section will define the three components that make up urban morphology: town plan, building fabric, and land use. Providing clear definitions of the components makes their roles more apparent and the interrelationships perceptible.

The first component is the town plan, also referred to as the ground plan, for a city. As previously defined, different scales create a built environment ranging from single structures to cities. Marshall & Caliskan (2011:413) state that these scales can range from buildings to metropolitan areas as they are all included in the urban fabric.

The analysis of the town plan consists of various components included in the built environment including properties, buildings, streets, parks and monuments (Moudon 1997:3). The connection between these components describe the linkages, access and restriction of the urban environment (Marshall & Caliskan 2011:413). This relationship between components provides the critical element to understanding the development of the urban area and the densification thereof (Pinho & Oliveira 2009: 108). Factors affecting this relationship are demographic, cultural and economic changes that may alter this relationship in either a constructive or deconstructive manner. The following physical components all form part of the town plan.

3.2.2.1 Buildings

Buildings can be defined as single structures consisting of hardened surfaces such as roofs, walls and floors (Dempsey *et al.* 2010:25). Buildings form the basis of any urban environment by providing necessary enclosed spaces for homes, offices and stores (Burgess 2015:14).

3.2.2.2 Blocks/plots

The term refers to a group of buildings consisting of recreational spaces and natural areas enclosed by surrounding streets. Schirmer and Axhausen (2016:104) describe blocks as long-lasting structural components that create the built environment and may consist of large areas of undeveloped land near the city's edge.

3.2.2.3 Streets

Streets can be identified as hardened surfaces used to transport and move vehicles, bicycles, trains and pedestrians. Streets are vital representations of an urban environment that create a connecting network based on their configuration (Schirmer and Axhausen 2016:101). Clifton et al. (2008:32) classify streets according to capacity and speed limit, identifying local roads, collectors and highways.

3.2.2.4 Fringe Belt

As defined by (Pinho & Oliveira 2009: 108), the fringe belt is an area containing land uses created at the edge of the city area to stop residential growth. In modern planning, this belt is referred to as the urban edge and is used to protect the surrounding natural or agricultural land from urban development.

3.2.2.5 Topographical Character

Topographical character refers to the natural area in which a city is located. As mentioned above, it refers to the mountains, rivers, vegetation and valleys within and surrounding an urban area. The spatial distribution and relation of physical natural features, for example, topography, geology and hydrology, affect the urban morphology of a city (Kropf, 2009:114). These elements are unaltered by human activity and create the basis of urban form.

3.2.3 Urban structure models

Different urban structure models have been developed since 1920, with the first being the Concentric Zone Model by Ernest Burgess (Burgess 2015:71). The model is based on the development of Chicago in the early 1900s as observed by Burgess. As illustrated in Figure 4, the concentric zone model is viewed as a series of concentric rings ranging from the inner city to the urban periphery (Burgess 2015:71). The inner city's centre is characterised by the Central Business District (CBD). The CBD consists of different businesses, offices and commercial activities. The second concentric ring is defined as the transition area, including the encroachment of businesses and deterioration of residential opportunities (Burgess 2015:73). The following three concentric rings are characterised by residential land uses that vary in density. The independent workers are closest to the CBD, followed by the zone of better residence and the commuters' zone. Although characterised by density, the residential concentric rings also relate to income levels for different workers. Independent workers characterised by lower income tend to reside closer to the CBD and work opportunities (Burgess 2015:73). A decrease in density is experienced in the zone of better residence for middle-income groups. Lastly, the commuter

concentric ring consists of low density of single-family dwellings that can afford to live further from the CBD and commute to work.

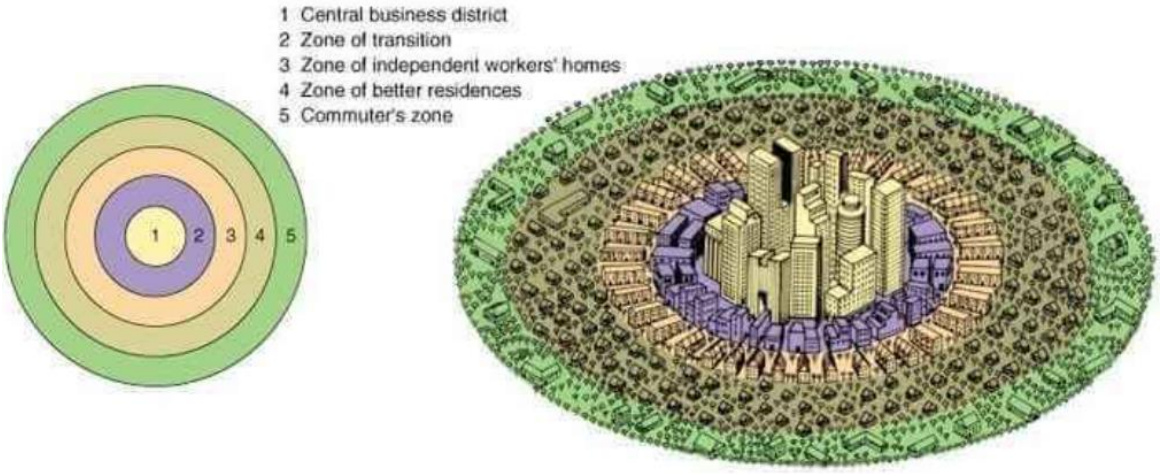


Figure 3-5: Concentric urban model.

Source: Mandich (2019:4) as cited by Rubenstein,

Following the Concentric urban model is the Sector urban model developed by Homer Hoyt in the 1930s. Figure 3-6 shows a concept design of the sector model, illustrating the development of a triangular-shaped urban model. These triangular shapes are defined as different sectors of the urban area (Anon 2020). The sector model consists of mostly the same areas as the concentric model, including the CBD, transportation and industry, and the three residential zones. These residential zones consist of low-, middle- and high-income groups. The model shares the same principle as the concentric model, as the CBD remains within the city's centre with the industry (transition) zone located adjacent to the CBD. The -income groups are primarily located close to the industrial zone to reduce transit costs and attract industrial workers (Anon, 2020). The lower income areas are characterised by high density and lower inadequate living conditions. The middle-income group tends to be able to afford better living conditions and reside further from the industrial areas. These areas have increased linkages to the CBD as activities are not primarily focussed on industrial work. The high-income group resides the furthest from the CBD, as travel costs are not a determining factor for the place of residence. The area is characterised by corridor development from the CBD to the urban edge and has the best living conditions. These areas also experience low residential development, less traffic, and a clean environment (Anon, 2020).

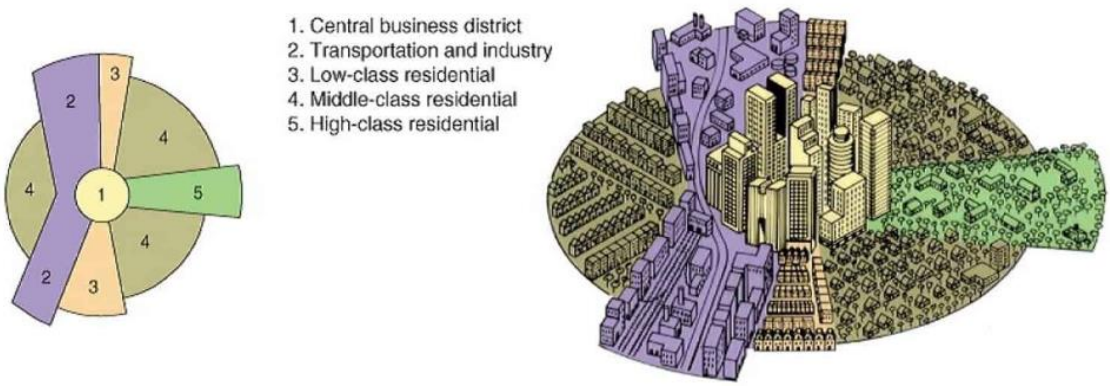


Figure 3-6: Sector Urban Model.

Source: Pearson Prentice Hall, Inc (2008).

A third urban model is the Multi Nuclei Model developed by Harris and Ullman (Meyer, 2000:263). The significant difference between the Multi Nuclei model and the previous concentric and sector models is the number of growth points. This model focuses on more modern cities taking into account the complexities and growth of the urban area over time (Anon, 2020). Urban areas may develop with a single CBD however, as the urban area expands and experiences development, the activities decentralise. As activities are decentralised, the surrounding property values are influenced, and economic opportunities are not concentrated within a central place.

Further, residents' living quality is improved as industrial areas are located away from residential areas. The figure shows that the CBD is still located centrally in the urban environment. Only light industries are located between residential neighbourhoods, and heavy industries are located at the periphery of the urban area. A clear difference between residential income groups is still noticeable in the urban model.

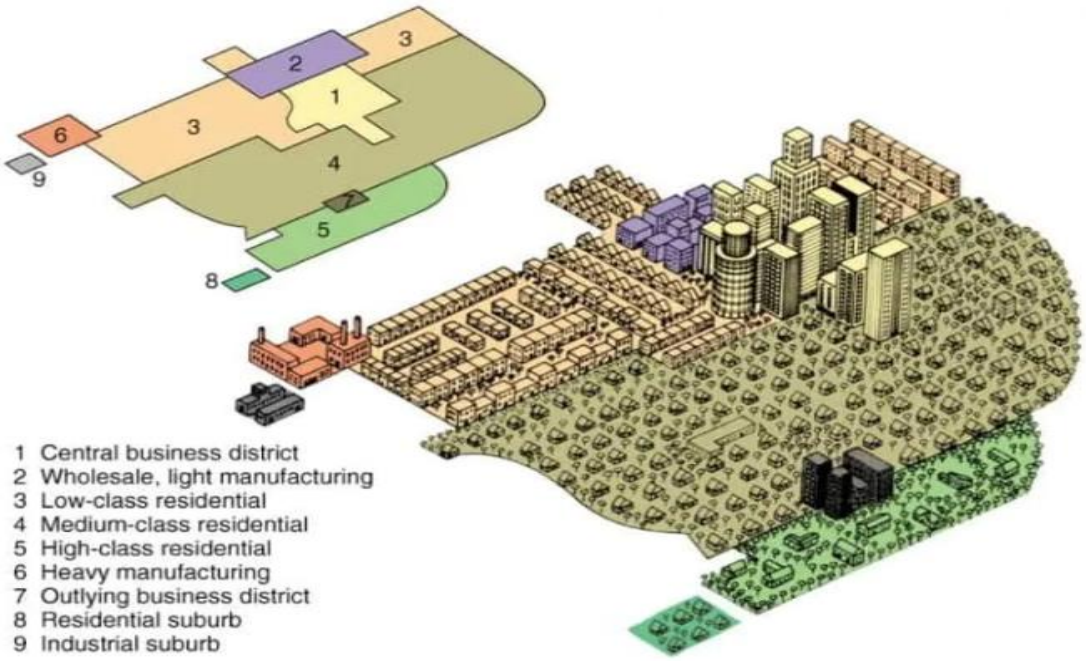


Figure 3-7: Multiple Nuclei Model.

Source: Pearson Prentice Hall, Inc (2008).

The final urban structure model is the Apartheid urban model that was specifically applied to urban areas in South Africa. The model was implemented to develop a segregated urban structure and to divide different racial groups (Maharaj 2020:39). This planning tool was used to control ownership, use and occupation of land and buildings. Separate social, educational and residential amenities were provided based on race. More than 1 million hectares of land were rezoned according to race and led to black residents being located on the periphery of urban areas (Maharaj 2020:43). The apartheid urban model reflects the same design as the sector urban model. The CBD core area is located in the centre of the urban area. The industrial area is developed linearly and directly connects with the CBD. Residents of lower-income groups and lower-racial status are located adjacent to the industrial area (Maharaj 2020:43). Middle and high-income groups are located furthest from the industrial area due to the poor quality of the urban environment surrounding it. (Maharaj 2020:44). The post-apartheid city is subject to discontinuous land uses and settlement patterns reflected in an inefficient spatial distribution of urban areas. Population distribution is mainly low-density residential development with higher low-income densities in peripheral urban areas. The implementation of the Reconstruction and Development Programme (RDP) and Urban Development Strategy (UDS) in 1995 created a paradigm shift. (Maharaj 2020:48). These development strategies focused on rebuilding the urban environment by creating employment opportunities, reducing travel distances, developing underutilised land and providing urban amenities (Maharaj 2020:48).

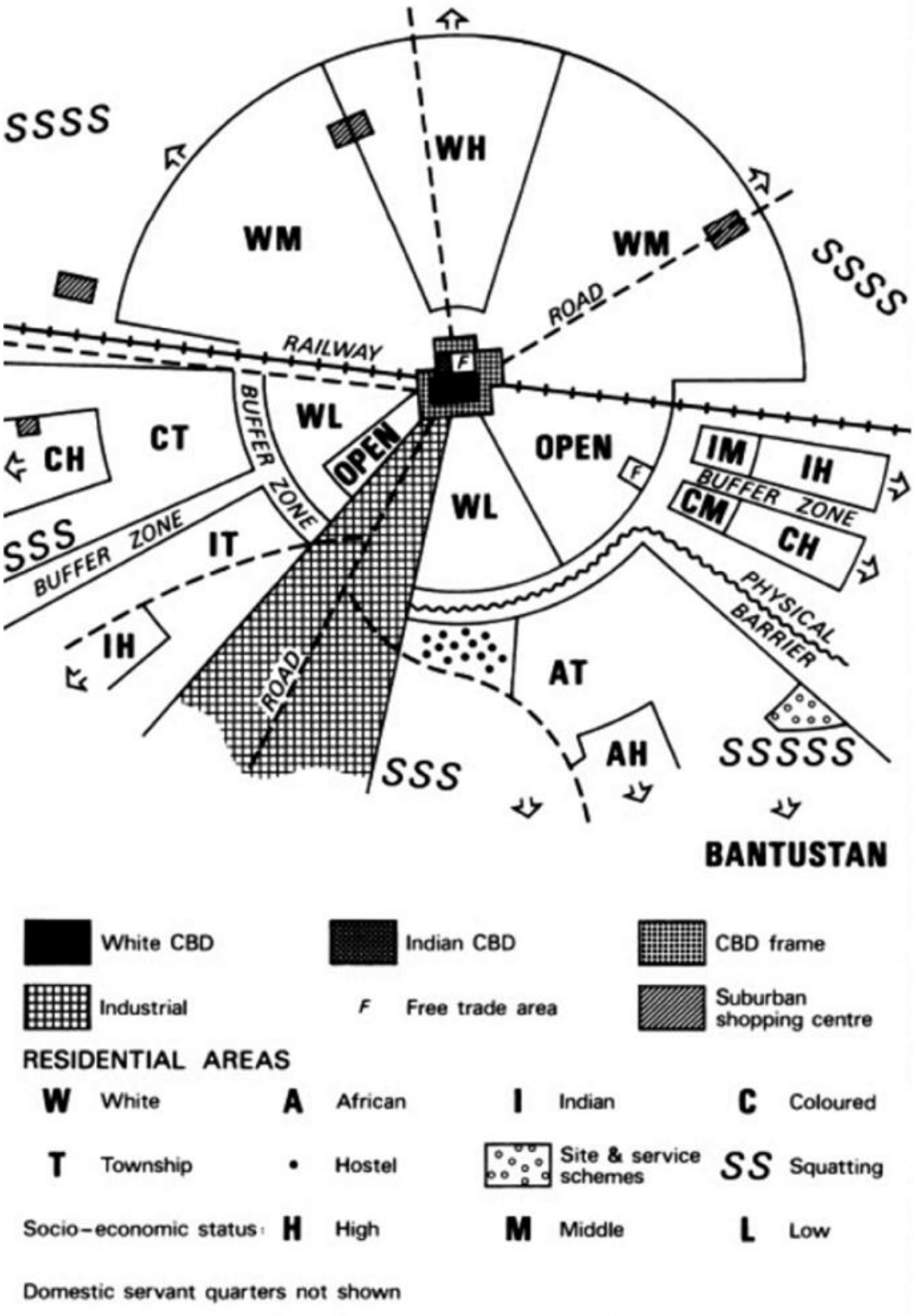


Figure 3-8: Apartheid Urban Model

Source: Maharaj (2020)

3.2.4 Conclusion

From the above, it is evident that the historical development of a city primarily determines urban areas. Components included in urban morphology provide a means of understanding the structure of urban form. The components identified will be used to define the urban form of the study area below. In a South African context, it is evident that the Apartheid urban model has had a detrimental impact on the urban form of cities. Although urban areas are not an exact representation of this model, a segregated urban form could be evident in the study area analysis in the following chapters. The location of different racial groups and the placement of industrial areas may prove valuable during this research paper as it could have affected the layout of the study area.

CHAPTER 4 URBAN DEVELOPMENT STRATEGIES

4.1 Introduction

The following chapter will evaluate how cities are developed according to the strategies implemented on a spatial scale. As highlighted above, different components of urban morphology could be placed strategically to modify a city's urban form. The relationship between these components will illustrate a "trend" in urban form which patterns create two distinctive spatial forms. The first is a fundamental urban form characterised by the fringe belt's outward expansion. This urban form consists primarily of low intensity land uses and population densities. It creates a segregated city with residential opportunities located in peripheral suburbs (Williams *et al.* 1996:12). This urban form is called urban sprawl. Long travel distances and a lack of urban containment characterise this urban form. The lack of urban containment results in the loss of rural areas and may negatively affect agricultural land uses and the environmentally sensitive natural area (Breheny, 1992, as referenced by Williams *et al.* 1996:12).

The second fundamental urban trend is an increasing concentration of economic activities and people. This trend is more spatially clustered and includes a combination of residential, social and economic activities in close proximity to each other (Williams *et al.* 1996:12). For this paper, further in-depth literature investigation will be conducted on this trend. Primarily the focus will be on the development strategies associated with intensification and densification. Their constraints and components will be critically evaluated to determine the appropriateness of implementing such a development strategy. After that, different development strategy approaches will be evaluated, for example, the compact city approach. Lastly, an evaluation of what is considered a "sustainable city" will be conducted to assess the associated characteristics. To conclude this

chapter, a possible intersection between intensification strategies and the sustainable city will be identified. This intersection will assist in possible approaches for development strategies to be proposed during the final section of this paper.

4.2 Urban intensification

Urban intensification is defined as having a compact urban form that includes high residential densities, a mixture of land uses, social- and economic diversity and efficient transport An and Gu (2018:898). Williams (2004:1) supports this statement by explaining that a compact city is an intensified urban area containing the abovementioned characteristics. The purpose of urban intensification is to functionally develop land to reduce urban sprawl and preserve the countryside. Both authors agree that the purpose of urban intensification is to create functional urban areas for residents. Functional urban areas include places where residents can live, work, shop, relax and interact, creating a high-quality environment (An & Gu, 2018: 899) (Williams, 2004:1). A high-quality built environment includes accessibility, safety, character and connectedness within the intensified urban area (Brunner and Cozens 2013:231). Carmona (2002:54) refers to Intensification as a method of revitalising downgraded urban environments by providing access to central places.

The development strategy of urban intensification aims to lessen the pressure of urban sprawl by increasing the density of urban areas and activities (An & Gu, 2018: 898). However, should communities protest against intensification strategies such as infill development and urban consolidation, a significant loss of surrounding landscapes and character is inevitable (Brunner and Cozens 2013:231). By creating intensified urban places, social cohesion is increased, and cultural development may be achieved. A diversity of facilities and amenities becomes highly accessible for residents (Williams, 2004:1). Economically, by achieving higher accessibility, the increase in population density may sufficiently support local businesses and services (Williams, 2004:1). Jabareen (2006:38) states that urban consolidation seeks to promote sustainable urban environments in light of energy-dependent lifestyles and climate change.

4.3 Urban Densification

Densification is described as quite similar to intensification, focusing on increasing urban activities and residential densities. Haaland and van Den Bosch (2015: 762) highlight approaches to densification, namely the establishment of new buildings in previously not built-up areas, redevelopment of built-up areas that previously had another purpose and areas with lowdensity being rebuilt by high-density structures. Densification promotes co-using existing land, buildings and services to restrict urban sprawl (Brunner and Cozens 2012:233). Commonly densification

pursues to reduce capital expenditure on infrastructure by ensuring efficient use of land and services (Brunner and Cozens 2012:233). Reducing development pressures may contribute to preserving environmentally sensitive areas and biodiversity (Brunner and Cozens 2012:233). Densification may enhance the social factors of urban areas and contribute to providing affordable housing accessible to residents (Brunner and Cozens 2012:233). Consolidation policies apply to densification by promoting increased population densities to establish viable living environments (Brunner and Cozens 2012:233).

Densification is subject to planning policies that guide development, for example, the Compact City approach implemented in numerous European cities (Skovbro, 2002:518). Densification policies are more sustainable when combining the quantitative concept of density with parameters and requirements that ensure high-quality urban environments (Wallin *et al.,* 2018:2; Haaland and van Den Bosch, 2015: 761). Densification should focus on quality urban environments by considering present and future scenarios concerning the environmental and social conditions of the area. Haaland and van Den Bosch (2015: 760) agree that creating resource-efficient urban systems should include good urban design. This will assist in determining interventions according to capacity and the possibility of improving the quality of the urban area and the quality of life (Wallin *et al.,* 2018:2; Haaland and van Den Bosch, 2015: 760). Jenks *et al.* (2000:15) agree with this statement when explaining that social and economic factors, for example, demographic growth, economic development, income inequalities and environmental infrastructure, have a serious impact on the effectiveness of densification policies instruments.

4.4 Development strategy opportunities.

Fatone et al. (2012: 219) touch on an undoubtedly important factor of urban development strategies by stating that each city has unique constraints and opportunities which require consideration. An and Gu (2018:899) highlighted possible opportunities that may be considered when development strategies are formulated. The first opportunity is infill development, specifically, the utilisation of vacant land in a built environment. This opportunity focuses on the revitalisation of urban areas by providing a high quality of life (Williams, 2004:2). The second opportunity is the renewal or revitalisation of urban development by rebuilding and restoring old structures (An and Gu, 2018:899). Williams (2004:2) refers to this opportunity as redeveloping urban areas at higher densities and exploring new development with compact forms on green field developments.

A complex relationship exists between densification policies and the loss of green space. This green space includes open spaces and rural land along the urban periphery. Haaland and van

Den Bosch (2015: 760) emphasise the importance of sustainable urban development through densification that includes urban green spaces and does not negatively impact natural spaces.

4.5 Constraints to development strategies

The section below elaborates on the possible negative implications when development strategies relating to urban Intensification are promoted. A fundamental statement is made by Williams (2004:2) that urban Intensification could not result in the sustainability of densities and land use due to the urban context. The implication is how development strategies are managed and if they will result in an efficiently functioning compact city. Managed intensification strategies could achieve the goal of maximising the benefits and minimising the negative impacts on the urban environment (Williams, 2004:2). Burgess (2000:15) emphasises that densification strategies may be critically affected by weak economic growth, lack of infrastructure, degraded natural environments, high demographic growth, and shortages of basic services.

4.5.1 Transport

A paper by Melia *et al.* (2011:1) emphasises the effect that intensification may have on an urban environment, especially transport systems. With the increase in residents and activities, the amount of traffic and motor vehicles is also bound to increase. This increase in traffic in urban areas causes negative externalities, for example, traffic congestion, pollution and a spectrum of health and social problems (Melia *et al.,* 2011:1). Fatone *et al.* (2012: 218) agree with these negative impacts when stating that high-density development could contribute to higher traffic congestion, an increase in air and noise pollution, and create conflicts between land uses.

4.5.2 Character and Social settings

As intensification focuses on the optimal use, the intensity of land use could result in negative conflicts with the character of an urban area (An & Gu, 2018:1). Maintaining unique urban characteristics is important for the community and sustainable urban development, especially when planning for densification in the future (An & Gu, 2018:898). The decrease in public places has a detrimental impact on a city's character and residents' social interaction. These spaces are commercialised and tend to lose their meaning and purposes. Public places include parks, squares and streets that are lost due to residential and commercial land uses (Carmona, 2002:53).

4.5.3 Environment

Densification policies may negatively impact urban green spaces and cause open space removal when development strategies are implemented (Haaland and van Den Bosch, 2015: 760). Developing cities could result in the degradation of the surrounding natural environment and the depletion of resources, including land, energy, water and minerals (Jenks et al., 2000:2). The development of low-density suburban areas on the periphery of cities may consume more resources that densified urban city areas Mitlin and Satterthwaite (1996) as referenced by (Jenks et al, 2000:2). Undeveloped land surrounding urban areas may be required for agricultural purposes and the loss of such land would negatively affect residents (Williams, 2004:3). Haaland & van Den Bosch (2015) examine different strategies and challenges relating to planning for urban green space during densification approaches. It is evident in this paper that densification processes, including infill development, may threaten green spaces. Urban densification is associated with high residential development, mixed land uses and functional public transport systems. The issue arising during densification is the lack of green space and the removal of these spaces during densification. Urban green space includes all spaces with vegetation in an urban environment, for example, open spaces, parks and residential gardens. Green spaces in urban areas contribute to the sustainability of development by providing multi-functional spaces relating to social and environmental functions.

4.5.4 Communities and Health

As living environments densify, the exposure to pollution and toxins increases resulting in damage to human health (Richardson et al. 2002:33). The risk of spreading diseases is increased in denser urban environments from overloaded sanitation infrastructure, contaminated water supplies or increased air pollution.

A recent example is the spread of the COVID-19 virus in cities around the world. Cities with higher densities, large populations and limited access to healthcare facilities experienced the impact of the virus more extremely. Due to the airborne nature of the virus, communities that interacted near each other were more affected. Countries such as India and China, with compact urban forms and large populations living in high densities, experienced high infection rates (Lone and Ahmad 2020:1303). African countries were expected to be the most vulnerable to health concerns due to the lack of required healthcare facilities (Lone and Ahmad 2020:1303).

Further, communities living in dense urban areas could be exposed to overcrowding. Suppose the goal is to densify urban areas in cities with high populations. In that case, a constraint to available space may result in an overcrowded living environment (Williams, 2004:3). This

constraint is increased further by population growth, leaving restricted space for other required uses. Although other required uses could refer to a sustainable mixed-use development area, it may result in a poorer quality of life due to health and safety conditions (Williams, 2004:3).

Burgess & Jenks (2002:15) quoted (Hardoy et al., 1990) when stating:

> *"What is the sense, it is frequently asked, of further densification given that densities are already high and associated with a range of problems, including infrastructure overload, overcrowding, congestion, air pollution, severe health hazards, lack of public and green space and environmental degradation? The sustainability gains from further densification will be limited under conditions where densities are already high. Under these circumstances, the merits of urban densification postulated for developed country cities seem far less convincing in the context of developing countries."*

4.6 Sustainable urban development

Sustainable development's primary goal is to ensure that today's decisions do not compromise future generations' development. (Jenks 2000:3). Haaland and van Den Bosch (2015: 760) found that the sustainability of development is associated with urban form and how policies guiding its development are implemented. Promoting increased sustainable urban forms include the Compact city approach, prioritising urban containment and implementing SMART city principles. Smart city principles include high-density developments, preserving open spaces and city centres (Clifton *et al.*, 2008:36). The implementation of sustainable urban forms aims at counteracting the negative effect of urban sprawl, urban expansion and fragmentation (Haaland and van Den Bosch, 2015: 760). Williams et al. (2000:) stated that in order to achieve a sustainable urban form development strategy guided by global sustainable goals should be underpinned in legislation. However, consideration should be given to implementing solutions together with local formation. Solutions focusing on inclusive and adaptive decision-making could be crucial for objectives relating to sustainability. Objectives relevant to sustainable development include promoting social justice, protecting environmental resources and inclusive decision-making procedures (Jenks 2000:3). Components with the potential to influence sustainable urban forms include densities, intensification, compact development, mixed land uses and open spaces (Jenks 2000:03). Sustainability could further be promoted in urban areas by reducing automobile dependence and preserving the ecological footprint (Richardson et al. 26:2000).

Factors negatively affecting sustainable development could include the unregulated growth of peripheral urban areas resulting in urban sprawl. This form of growth is characterised by a lower quality of life and environmental degradation (Jenks 2000:05). Urban sprawl further includes the

encroachment of urban development on prime agricultural land (Richardson et al. 33:2). The income level of residents determines the use of automobiles in cities and this, in turn, decreases the use of public transport.

Jenks (2000:05) refers to the viability of sustainability and compaction of South African cities, although significant plans are in place. These plans encourage higher-density development along transport routes and provide citizens access to cities' opportunities.

4.7 Compact City

Haaland and van Den Bosch (2015: 760) define the Compact City as an urban area consisting of high-density residential, mixed land uses efficient public transport and promoting walkability and cycling. The compact city further increases in density closer to the city centre due to the prevalence of mixed-use urban areas (Richardson et al., 25:2000). (Burgess 2002:24) further elaborates on the definition of a compact city by stating that an increase in population density and built area, together with intensifying economic, social and cultural activities, are related to a compact urban form. These methods seek to manipulate urban form, size and structure to gain social and environmental sustainability benefits by concentrating urban functions (Burgess 2002:24). Compact cities advocating higher densities perceive more positive perception, especially in developing countries (Williams et al., 1999). The compaction of urban areas may result in more sustainable service provision, education facilities, public transport systems and healthcare facilities (Jenks 2000:3). Compact cities further offer a richer street life and vitality than those of sprawl and segregation (Richardson et al. 26:2000).

Strategies such as densification and intensification are introduced as planning controls to promote the compact city approach. Williams (2004:2) states that for cities to develop according to the compact city model, a process of intensification is implied. One commonly used planning tool is the implementation of a fringe belt surrounding the urban areas. The tool aims to restrict outward urban development and contain it within the urban edge. This planning tool may result in higher densities due to a reduced land supply for residential and commercial land use development. The result could further increase land prices resulting in a more vibrant economy (Richardson et al. 26:2000).

In turn, compact urban areas could potentially have negative factors associated with increased densities and land use. Richardson et al. (25:2000) argue that a negative impact, such as severe traffic congestion, could potentially occur in urban areas undergoing a compact urban development strategy. However, traffic congestion may be a by-product of street design, resource constraints in transportation infrastructure investment and lack of land allocated for roads. This

inadequate allocation of land for transportation purposes reflects poor planning- and design guidelines and the absence of traffic management and parking regulations. Traffic congestion is less a consequence of compactness and high densities than transportation infrastructure design. Population density and motor vehicle ownership have a positive relationship for cities with higher densities and a more negative relationship for low-density cities (Richardson et al. 30:2000). Another potential negative impact of the compact city model is the pollution of air and water resources, which, in turn, leads to environmental degradation and loss of biodiversity in natural areas. However, environmental degradation can be related to poor environmental regulations and weak enforcement rather than the implementation of a compact city model. The view of Hardoy and Satterthwaite, as referenced by Richardson et al. (2000:30), argues the compact city's negative impact on the environment. Compact cities offer an advantage by reducing infrastructure costs and providing services in terms of waste management, pipes, sanitation and stormwater management. They argue that the lack of institutional capacities for service delivery causes a negative impact on the environment rather than the increase in densities in compact cities.

The question asked by Williams (2004:2) is if the compact city model could create more sustainable cities globally. For compact cities to be sustainable, efficient management will be required. To merely increase the density of urban areas and provide a mixture of land uses may not result in a sustainable urban context (Williams 2004:5). Provision of high-quality infrastructure and management of public transport systems will be required. Efficient access to basic services such as water, electricity and sanitation is required. Standards should be set to maintain noise and air pollution. Public facilities, including health care and education, should be accessible to most urban residents (Williams 2004:5). Urban areas need to be maintained as safe, clean and liveable environments for all residents. Williams (2004:6) concludes by stating that high levels of investment will be required together with efficiently managed urban development strategies to attain a sustainable compact city.

4.8 Conclusion

Development strategies appear to be how the future development of urban areas is spatially coordinated and expressed. Urban densification and intensification focus on more compact urban development. Clustering facilities spatially increases residential opportunities and allows transportation linking urban components to be incorporated into these strategies. Development strategies are progressively refined to overcome observed constraints, specifically components impacting community health and safety. A clear relationship is observed between sustainable development and the compact city development approach. Both seek to limit urban sprawl by containing development and increasing urban functionality. These development strategies seek

to rectify previous urban form and structure shortcomings. An apparent focus is placed on protecting the remaining natural environment and increasing ecological functionality within and around urban areas.

CHAPTER 5 OPEN SPACE

5.1 Introduction

The following chapter will analyse one of the components of urban morphology in more detail: open spaces. An extensive literature review was conducted to grasp the extent of this component. The component will be firstly defined according to different definitions from academic papers. Following this section, the component's function and services will be investigated to determine its role within urban areas. In order to incorporate open spaces within urban areas, the methods of planning and managing these spaces will be critically evaluated. This chapter will then highlight potential shortcomings in the empirical investigation. Extensive literature may prove valuable when findings are elaborated, and potential recommendations are suggested.

5.2 Open Space Defined

One of the core components impacting urban configuration is open spaces. The term "open space" refers to a wide variety of spaces throughout and surrounding urban areas. Haq (2011: 601) defined open spaces as either public or private spaces containing vegetation and being available to users. Open spaces are characterised by low levels of intervention in these areas' natural aspects to maintain their uniqueness. The low levels of intervention help to ensure the continuous functioning of ecosystems without the intervention of developments that can harm this natural aspect (Maruani *et al*., 2007:2). These spaces, however, exist inside and around cities towards the rural landscapes. To better understand the wide range of spaces forming part of urban open spaces, Shi *et al*. (2014:5) mentioned that parks, woodlands, corridors along rivers, institutional grounds, sports grounds and walkways all form part of open spaces. These open spaces form part of planning as boulevards, plazas, streets and squares within and around cities (Shi *et al*., 2014:5). Open spaces within and around cities contribute to the environmental aspect of cities and the quality of life of communities in cities. The importance of these aspects of open spaces is becoming more recognised in the planning and development of cities (Faizi *el al*., 2011: 4000). Thus, open spaces can have two functions, either providing recreational and other services to communities living in cities or being used as a tool to conserve natural values (Maruani *et al*., 2007:2).

Integrating open spaces by linking them through other urban components could create an urban open space system.

5.2.1 Open Space Services

When open spaces provide recreational services for cities, they provide a broader range of leisure activities for people visiting these spaces. These activities can either be passive (observing scenery) or active (playing sports). However, planning for recreational activities in open spaces requires a diverse system that suits the needs of different population groups (Maruani *et al*., 2007:2). When planning for recreation, different parameters should also be met, such as the size and distribution of open spaces, how these spaces are integrated into the urban environment, accessibility of these spaces and the sustainability for the future (Maruani *et al*., 2007:2). Abbasi (2015:196) said that four primary aspects encourage people to visit open spaces namely, activeness, accessibility, comfort and sociability. By using nature in the planning of recreational spaces, certain aspects are added to this open space, namely, psychological (relaxation and stress relief), moral attitudes (relationship between humans and nature), social (interactions between people and social integration) and scenic (promoting green environments in cities) (Maruani *et al*., 2007:2 & Brander *et al*., 2011:2763).

Open spaces form the green lungs of cities, and they contribute to the communities' psychological and physical health by providing areas for breathing space in an urban environment (Shi *et al*., 2014:5). This breathable environment impacts the quality of life by adding value for people through educational and aesthetic characteristics. Open spaces also contribute to the quality of life through the reduction of the negative aspects of living in an urban area by regulating temperature, controlling pollution and reducing noise pollution (Shi *et al*., 2014:5 & Czembrowksi, 2016:17). These factors encourage the usage of open spaces in cities as well as people contributing to the maintenance of these spaces.

For open spaces to be efficient in people's everyday lives, they have to be accessible for people throughout the city, and proximity enables accessibility. If these spaces are well designed, they encourage walking and cycling for communities within the urban area (Faizi *et al*., 2011: 4000). Wu and Plantinga (2003:289) explained that migration decisions of people are influenced by open spaces as they would prefer living close to such spaces. Another major aspect contributing to how people use open spaces is the integration of open spaces within the urban environment. Open spaces connected through walkways also promote open spaces between buildings (Van Herzele & Wiedemann, 2002:110). The overall size of these open spaces also determines their significance for communities using them. Larger open spaces may be used for weekend recreational purposes, while smaller open spaces, such as parks, form part of people's everyday

lives (Van Herzele & Wiedemann, 2002:110). As open spaces are planned for delivering services to communities in the urban setting, they also hold a natural aspect in the urban environment which is discussed below.

5.2.2 Natural aspect of open space

Cities face different urbanisation rates, leading to the expansion of urban areas. Expansion brings issues regarding the sustainability of these cities and the natural environment surrounding them. The built environment of cities represents higher levels of human intervention in the ecosystem and interferes with natural processes. Intervening in natural environments can lead to irreversible damage to irreplaceable natural assets (Maruani *et al*., 2007:2). There must be low levels of human intervention to ensure the environment's quality. Open spaces are able to support urban ecology and provide needed services in a natural manner (Shi *et al*., 2014:5). In this manner planning for open spaces becomes a form of conservation and protection of the natural environment against human intervention (Maruani *et al*., 2007:2). Natural areas have unique characteristics which include dynamic ecosystems processes that can be influenced by external inputs (Maruani *et al*., 2007:2 & Czembrowksi, 2016:12). These characteristics provide the communities of cities with services that are ecological (conservation of biodiversity) and environmental (maintaining water and air quality) (Geoghegan, 2001:91). These types of services can indirectly lead to economic benefits however determination of benefits remain restricted. (Maruani *et al*., 2007:3 & Czembrowksi, 2016:12). To be able to conserve these natural aspects through planning, priorities must be set in the form of vulnerability, diversity and the uniqueness of ecosystems (Maruani *et al*., 2007:3 & Brander *et al*., 2011:2765). However, the location of these open spaces can only be determined by their spatial location in the urban environment

(Maruani *et al*., 2007:3). These open spaces act as boundaries for cities' urban fringes and separate different neighbourhoods (Shi *et al*., 2014:5).

Figure 5-1: Open Space System

Source: Hill, A. (2013).

Figure 5-1 above spatially illustrates how an open space system can be developed within an urban environment. The larger open spaces are connected by green corridors that run along the streets of the city. The map demonstrates how an open space system can by integrated in cities that provide both services to communities and a natural aspect the urban environment needs to help sustain the ecosystems in the city. Hill (2013) described this as being a "ecological Innovation" for the urban environment.

5.3 Multifunctionality

Multifunctionality is a term used to describe areas with more than one function. This mixture of functions makes areas much more efficient within the urban context. As space is limited within

urban areas, making areas multifunctional contributes to the development of mixed land use and promotes inclusive living environments (Shi *et al*., 2014:9). The difference between multifunctional and mixed land use is that multifunctional areas are created by integrating different functions into the existing landscape in an effective way (Ling *et al*., 2007:286). In figure 5-2, Shi (2014:10) provides five functions in multifunctionality, namely, ecological, economical, socio-cultural, historical and aesthetic. These five functions all contribute to designing a practical and multifunctional area. When considering open spaces, these functions help integrate the open space with surrounding urban environments and supply different characteristics to the city.

Table 5-1: Functions of open spaces

Multifunctionality					
Function	Ecological Functionality	Economic Functionality	Socio-cultural Functionality	Historic Functionality	Aesthetic Functionality
Community Perception	An "area for living"	An "area for production"	An "area for recreation and identification"	An "area for settlement and identity"	An "area for experiences"

Source: Own construction based on Shi *et al*. (2014:10)

Table 5-1 briefly illustrates the types of functionality and the type of area it creates within an urban area. These area types relate to how communities will perceive open spaces and their function. With the combination of these functions into an open space, the area will have succeeded in being multifunctional and providing different purposes for the community. Even with a good understanding of multifunctionality in open spaces, without an effective planning approach, these open spaces are not integrated and managed in the city system (James et al., 2009:66).

5.3.1 Ecological Functionality

Ecological functionality refers to the landscape elements required to accommodate natural processes within the urban area (Ling *et al*., 2007:289). These natural processes supply cities with biodiversity and regulate urban climate throughout the city. The urban heat island effect occurs in cities because the built environment increases temperatures by absorbing heat. This phenomenon can increase city temperatures by up to five degrees Celsius (Haq, 2011:602). Cities also produce large amounts of pollutants within the urban area, which can harm citizens. Air pollutants such as carbon dioxide and nitrogen dioxide are highly toxic to humans. Ecological

functions help maintain this pollution through plants and trees absorbing these harmful gasses (Haq, 2011:602 & Czembrowksi, 2016:17). According to Haq (2011), the amount of air pollution can be reduced by 85% if filtered through parks and vegetation. Noise pollution is also common in cities with their immense number of cars, but this pollution can be reduced with the implementation of ecological functions. Lastly, ecological functionality also contributes to biodiversity and nature conservation in cities (Thompson, 2002:62). By planning for a functional network of open spaces, the ecological aspects of cities become more sustainable and contribute ecological services (Haq, 2011:602). Ecological services include regulation of urban climate by reducing wind speeds, absorption of solar radiation and regulating temperatures (Haq, 2011:602 & Grose, 2009:60). This functional network also contributes to the distribution of animal species throughout the city by providing a type of natural corridor (Thompson, 2002:62).

5.3.2 Economic Functionality

Economic functionality can be either a direct or indirect part of open spaces. Direct economic functions refer to the capacity of products that can be produced in an open space. Indirect economic functions refer to the benefits of providing non-commodity outputs (Ling *et al*., 2007:289 & Abbasi *et al*., 2015:195 & James *et al*., 2009:72). Directly, open spaces can have economic functions such as agricultural properties that produce goods for the economic benefit of communities. Haq (2011:602) identified two ways economic functionality could be indirectly functional. Firstly is the amount of electricity saved due to lower cooling instrument usage in the city environment. Trees and plants improve air circulation within cities to help regulate the heat created by the built environment. They also provide shade for the buildings around them (Haq, 2011:602 & Bengston *et al*., 2003:273). This effect can be detected in the surrounding areas of open spaces. The second indirect economic function is the increase in property value. The number of open spaces surrounding residential areas contributes to the value of properties. This financial value can be increased up to five per cent for land developers (Haq, 2011:602 & Van Leeuwen *et al*., 2011:21). Wu and Plantinga (2003:289) supported this statement when saying that an inverse relationship exists between distance to open spaces and housing prices

5.3.3 Socia-cultural Functionality

The socio-cultural functions that open spaces can provide are mainly reflected in the use of open spaces as recreational grounds for social activities between citizens (Wendel *et al*., 2012:280). The provision of recreational activities, possible food security and interactive spaces also taken into account of socio-cultural functions (Ling *et al*., 2007:289 & Groose *et al*., 2009:62). Open spaces provide a sustainable proportion of outdoor leisure opportunities for communities living

near these open spaces. These opportunities enhance the well-being of people by providing a source of relaxation. Haq (2011:603) stated that Chapultepec Park in Mexico City receives up to three million visitors weekly. Regarding human psychological health, people exposed to open spaces and natural environments experience rapid levels of stress relief compared to people not exposed to this natural aspect. Thus, the connection between humans and a natural environment is needed for mental health, work productivity and a decrease in stress (Haq, 2011:603 & Czembrowksi, 2016:17).

5.3.4 Historical and Aesthetic Functionality

Both historical and aesthetic functions are associated with the uniqueness of open spaces, the traditional rural features and the non-fragmentation of landscapes. When assessing the historical function of open spaces, there can be a clear link between the open space and historical events of the urban environment. Open spaces can be placed to conserve historical grounds and preserve areas that contain traditional value. Regarding authentic functions of open spaces, the built environment is also taken into consideration based on the integration of buildings into the natural landscapes (Ling *et al*., 2007:289 & Leeuwen *et al*., 2011:23). Historical features found outside city boundaries act as a place for solitary recreation (Thompson, 2002:69).

Figure 5-2 below illustrates the different functions of an open space combined into a multifunctional open space. The figure was part of a workshop to gain input from the public interactively. Students from pre-tertiary facilities were allowed to generate possible design ideas for the area. These inputs generated a collective design proposal for a more sustainable urban area for future development. Playgrounds and recreation spaces with seating are provided for people to interact socially. Stalls are set up along pathways to sell goods and promote economic activity. Although not clearly illustrated, different tree species, lawns and gardens are combined to achieve increased ecological functionality. A clear integration between the open space and surrounding buildings is evident in the figure below. The urban area's development seeks to include the open space as a functional component to provide necessary amenities and facilities.

Figure 5-2: Multifunctional Open Space Design
Source: Sondarajan, G (2020:1)

5.4 Open space planning

Open space planning refers to the way open spaces are designed, their size and the location of these spaces (Wendel *et al*., 2012:281). Maruani (2007:3) defines two ways in which the planning of open spaces can be approached. In figure 5-4 below the two approaches to planning open spaces are based on a supply/demand approach (Maruani *et al*., 2007:4). The most typical approach is used by urban planners and geographers as it is focused on satisfying a demand for recreation by the communities living in urban areas. These planned open spaces consist of gardens and parks found within cities (Maruani *et al*., 2007:3). This form of planning for open spaces links to the approach of demand mentioned in figure three below. Attributes of the targeted population directly influence this approach. Overall this will influence the distribution of open spaces, the size of open spaces and the demographic values (Maruani *et al.,* 2007:4 & Wendel *et al*., 2012:281). Attributes of nature will also be considered in the means of topography and how accessible these open spaces are for communities. Abbasi (2015:195) emphasises the importance of knowing the communities' needs towards open spaces to attract them and motivate them to spend more time on activities they can enjoy.

Planning aspect	Examples of guiding planning principles	
	Demand approach	Supply approach
Site selection	Proximity to users Accessibility (e.g. mild topography, no obstructions) Visibility Relation to other open spaces	Presence of high-quality natural values Uniqueness of natural values Sensitivity or vulnerability of natural values Visual quality Integrity of ecosystem Vital ecological processes
Quantitative measures	Size of each open space unit Total amount of open spaces	Preferably defined by natural features or ecosystem boundaries (e.g. drainage basin)
Types of activities	A variety of recreational activities Activities fit for different groups Suitability to special needs and preferences	Limited outdoor recreation (e.g. hiking) Activities compatible with conservation goals
Site design	Design for intensive use High maintenance Wide selection of facilities	Minimal intervention Limited access Few facilities Low maintenance

Figure 5-3: Demand and supply approaches to open space planning.

Source: Maruani *et al*. (2007:4)

Conservationists and ecologists are typically involved in the second approach regarding planning for open spaces. This approach focuses on conserving existing natural landscapes and ecological systems (Maruani *et al*., 2007:3 & Brander *et al*., 2011:2771). This form of planning focuses on supplying natural aspects for cities, such as biodiversity, as mentioned in figure 5-3. This conservation of natural aspects relies on ecological, spatial and visual attributes to determine the areas to be included in planning. This type of planning contributes to making open space functional in terms of ecological aspects that contribute.

5.5 Challenges for open space planning

When planning for open spaces, a few challenges restrict the planning process and result in possible constraint. Open spaces are used more frequently when they are accessible to people. For open spaces to be accessible, they have to be within reach of people living in the urban area who do not have access to transport. To promote open spaces out of reach of people, public transport that frequently passes by open spaces helps in promoting these spaces (Thompson, 2002:60). Wendel et al. (2012:280) agree with the issue of accessibility. They also mention the impact of usability on residents regarding their individual preferences. Thus, the implication of user preferences, the distance to open spaces, and the time consumed at open spaces were the

leading issues regarding the use of open spaces (Wendel et al., 2012:208 & Wolch et al., 2014:236). Implications of a country's planning history may also hold issues in planning for open spaces. Segregated cities and cities experiencing urban sprawl can find it harder to place the location of their open spaces as the spatial distribution of open spaces will affect the frequency of use. Planning history of cities has another implication towards open space planning, which is the city's existing parks and framework (Koohsari et al., 2015:80 & Bengston et al., 2003:280). These parks may struggle to accommodate the growing number of people in cities, and they do not function with modern complexities (Thompson, 2002:60 & Wolch et al., 2014:235).

The next challenge focuses on the development, maintenance and quality of open spaces that has a financial implication. The amount of funding required for planning efficient of open spaces could impact its quality. Lack of funding can also be related to a country's government that lacks the money needed to develop open spaces within the urban area efficiently. One issue from open space planning is how open spaces are integrated with different city functions. This issue focuses on the multifunctionality of open spaces and how ecological, economic, historical, social and aesthetic functions are attained and integrated with the urban setting (Shi et al., 2014:19 & Bomans et al., 2009:197). The lack of knowledge in integrating these functions' into the complex nature of open spaces may be a concern. The last issue concerning the planning of open spaces is the sustainability of these spaces (Shi et al., 2014:4 & Bomans et al., 2009:204). Planning for open spaces can become tough when the open spaces must be able to accommodate future trends and cope with the frequency of visits. All the issues discussed have implications for sustainability and can revoke sustainability as a whole. Shi et al. (2014:5) state that green infrastructure and multifunctionality help achieve sustainable open spaces.

5.6 Open Space Management

The management of open spaces becomes most important when assessing their effectiveness. This aspect is ensured by high levels of maintenance and the range of facilities and activities provided in the open space (Shi *et al*., 2014:12). These activities can include music, natural beauty, educational programmes and leisure enjoyment to ensure the main goal of open spaces is being met (Shi *et al*., 2014:12 & Abbasi *et al*., 2016:196). Planning and design of open spaces cannot solely achieve total efficiency, but the management of open spaces can maintain high quality. Open spaces management goes beyond keeping high-quality open spaces for communities. Effective management helps enhance biodiversity and ecological processes (Shi *et al*., 2014:13). Faizi *et al*. (2011: 4000) state that open spaces cannot just consider the needs of communities but must incorporate the natural aspect in open spaces. This raises the problem of integrating community activities into an ecologically sensitive landscape (James *et al*., 2009:70 &

Shi *et al*., 2014:13). The management of open spaces cannot be dependent on a single discipline as the multiscale approach needs a multidisciplinary collaborative approach to be effectively integrated(James *et al*., 2009:70). The use of open space management is key in providing multifunctionality in open spaces by integrating different functions (Bononberg, 2015:1722 & Shi *et al*., 2014:13). Thus, by ensuring multifunctionality, the functions are enhanced. Communities can benefit from these open spaces. Management alone cannot ensure the park's physical condition, but regular upkeep of the open space will maintain its quality.. Management of open spaces can be seen as combining open space maintenance and development in an integrated approach. The management of open spaces can include an adaptive aspect to help maintain an ever-changing natural area (Shi *et al*., 2014:13). As nature is a changing aspect the way people understand and interpret nature can change, making the management of open spaces dependent on the knowledge of people. The issue arising from management is the lack of communication to maintenance in day-to-day activities and operations (Van Herzele & Wiedemann, 2002:110). By minimising this gap, these services will gain the same priorities, and overall goals will be much easier achieved (Abbasi *et al*., 2016:196). This integration of services helps satisfy community needs and sustain the open space's natural aspects. Communities feel safer in an environment that is well maintained and has lighting to ensure security and is linked to the well-being of communities (Irwin *et al*., 2004:709).

Regarding the natural aspect of open spaces, integrating management and maintenance can help improve bio-diversity, not just conserve it. Thus, the role of managers and authorities should be to enhance biodiversity and improve the quality of communities and the urban environment. The changing nature of the natural environment and the communities must be evaluated to best manage and maintain open space quality (Shi *et al*., 2014:13 & Siregar, 2014:16).

Bengston *et al*. (2003:271) stated that open spaces can be better managed and protected against development with a wide range of policies regarding urban sprawl. Bengston *et al*. (2003:274) identified policy instruments for managing open spaces and urban growth. One of these policies is the public acquisition of land to protect open spaces. Furthermore, this policy is also used as an instrument to help shape the form of metropolitan areas (Bengston *et al*., 2003:274). The investment in green infrastructure helps to shape city areas in modern times with parks, and urban fringes such as the investment in grey infrastructure shaped the form of urban areas in terms of roads and waterlines (Bengston *et al*., 2003:274 & Ling *et al*., 2007:291). Another policy is the restriction of annual building permits to restrict the growth of communities. Governments regulate this restriction to satisfy the growth in needed public facilities and the amount of built environment (Bengston *et al*., 2003:275 & Leeuwen *et al*., 2011:25). The oldest policy stated is the acquisition of land that has to be protected in the form of open spaces. This type of policy is relevant in

different governmental spheres, local and regional, to ensure diverse landscapes such as parks, wildlife reserves and forests Bengston *et al*. (2003:277). The only negative aspect of this type of public acquisition is that it is expensive to implement and maintain the protected open space (Bengston *et al*. (2003:277).

5.7 Conclusion

Concepts discussed in the above literature review form part of open space management, design and functionality. Each aspect contributes to the efficiency of open spaces and how open spaces are perceived by residents of the urban area. By effectively planning and managing open spaces, they could become integrated into the urban setting in which they are located. Increasing the number of functions can further enhance the perception of open spaces. However, the opposite may also be apparent as negative factors influencing the perception of residents could negatively on open space utilisation. The crucial part of the above is that open spaces should be planned and managed during the development of urban areas to ensure their perseverance.

CHAPTER 6 EMPIRICAL INVESTIGATION

6.1 Introduction

This investigation will be conducted to obtain the information and data contributing to the empirical investigation. The empirical investigation will consist of three phases that was conducted in order to assess the analysis of open spaces in the George city area. The George city area is currently undergoing increased densification, and a need for adequate open spaces may prove to be evident. The first phase is determining an adequate research methodology that will be used to conduct the empirical investigation. This methodology will determine the data types that will be collected and evaluated. Secondly, case studies from international examples will be examined to determine factors involved in open space planning and management and how to incorporate these spaces into development strategies. From these case studies, different factors will be determined, which will form part of the empirical analysis of the George city area. Thirdly development policies and guidelines will be assessed from international, national, provincial and local documents. This part of the empirical investigation will establish the different policies implemented to incorporate, protect and develop open spaces. From these case studies, policies and guidelines, the approach to developing open spaces in the George city area will be assessed. A critical analysis will be conducted to determine if efficient planning has been used for the densification of the George urban area. The empirical study will conclude with examining and assessing George's open spaces in terms of the factors found in the case studies and policies set out by the spatial development framework of the city.

6.2 Empirical Research Methodology

As stated above, a complementary mixed-method research approach will be conducted to understand the incorporation of open spaces in development strategies. Qualitative data will be generated primarily through evaluating legislation on both international and national levels. Research creates the basis of policies on all government spheres guiding economic system development (Kothari 2004:5). Policies and guidelines contained in legislation will create the foundation for proposed recommendations in the sections below. As international legalisation is applied to specific cities and countries, only broad policies will be included in this paper. In South Africa, different legalisation applicable to development strategies and open spaces is available in multiple spheres of government. Legislation from a national perspective provides the overarching guidelines for development in South Africa. As the spheres of government become localised, the guidelines and policies focus on the specific character of the province, district and municipality. An in-depth evaluation was conducted on a local level, including the municipal spatial

development framework and local spatial development frameworks applicable to the study area. International case studies that have observed open space development in urban areas were evaluated to add qualitative data to the empirical investigation. Case studies provide a careful observation of social aspects related to open spaces. The needs, dislikes and requirements of open spaces were identified in case studies and assisted with informative recommendations.

Quantitative data collection will be included in the study area of this paper. The analysis was conducted on the areas of interest, including land uses, open space sizes and functions. Observations were conducted on the use of areas together with the relevant development strategies. Possible opportunities for improvement of functionality are crucial to the success of recommendations. Understanding the current social need towards open spaces and accompanying development assists in considering real-time scenarios.

6.3 International Legislation, Policies and Guidelines

This section will investigate international policies/guidelines/legislation directed at developing compact- and sustainable urban development strategies. Development strategies, especially in first-world countries, indicate a strong focus on sustainable development as a critical guideline for the compact urban design. The Sustainable Development Goals 2030 will provide key factors relating to sustainable development. These goals provide the pillar on which new policies may be focussed to increase the functional development of communities worldwide. Following the international perspective, an in-depth analysis of the legislation and policies in South Africa is conducted.

6.3.1 Transforming our world: The 2030 Agenda for Sustainable Development

The 2030 Agenda for Sustainable Development provides a set of actions for people, prosperity and the planet (Desa 2016:5). The plan seeks a collaborative partnership between countries and stakeholders. A total of 17 goals and 169 targets are set for sustainable development over a 15-year timeline (Desa 2016:5). The agenda acknowledges countries' different circumstances and capacities. Each government should set their national targets guided by the agenda, taking into account national circumstances (Desa 2016:16). National governments should recognise the important link between sustainable development and environmental, economic and social processes (Desa 2016:17). For this paper the following sustainability goals and target have been included:

Goal 8: “Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all”:

- “Achieve higher economic growth through diversification, upgrading and innovation.” (Desa 2016:5).
- “Promote development-orientated policies that support productive activities and employment opportunities.” (Desa 2016:5).

Goal 9. “Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation” (Desa 2016:5).

“Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human wellbeing, focusing on affordable and equitable access for all.” (Desa 2016:5).**Goal 11**. “Make cities and human settlements inclusive, safe, resilient and sustainable” (Desa 2016:5).

- “Ensure access to safe, affordable housing and basic services.” (Desa 2016:5).
- “Provide access to affordable, safe, sustainable and accessible transport systems. Expand public transport systems and access for vulnerable communities.” (Desa 2016:5).
- “Enhance inclusive and sustainable urban development by integrating human settlements planning and management.” (Desa 2016:5).
- “Protect natural and cultural heritage.” (Desa 2016:5).
- “Provide universal access to safe, inclusive and accessible, green and public spaces.” (Desa 2016:5).
- “Support economic, environmental and social linkages between urban areas by strengthening development planning.” (Desa 2016:5).

The goals and targets above touch on the sustainable development of urban areas. Development planning should incorporate social, environmental and economic aspects. A target for open spaces development is also included.

6.4 Case Studies

For this empirical study, three case studies were identified to be evaluated on their chosen areas, methods used, and the results drawn from their study. These studies were selected through a purposive sampling method. The sampling methods criteria were based on the type of study conducted and the inclusion of open spaces in the study. Their results reflect specific problems tied to open spaces and the factors that improved how open spaces are perceived by the public. Each case study is situated in different cities around the world. These case studies also reflect the differences between First- and Third World cities. Each case study selected an area that consists of urban and open spaces. The selected open spaces are evaluated by their functions, and people of the community are approached to gather their perceptions of the open spaces. The case studies identify and evaluate why open spaces become dysfunctional using this information.

International case studies were selected due to the lack of adequate case studies of a local level. Each selected case study included a unique component relating to the provision of open space and the perception thereof by the local community. These components included multifunctionality, design and location.

6.4.1 Case study 1: Use of small public urban green spaces (SPUGS)

Figure 6-1: Location of Copenhagen, Denmark.

Source: Google Maps. 2019.

This case study is set in the city of Copenhagen, Denmark. The purpose was to evaluate how open spaces are used and perceived by residents of this city. The goals were to determine the people who use these open spaces and their main reasons for using them (Peschardt et al., 2012:239). The frequency of use of these open spaces is compared to the distance people need to travel to reach these open spaces.

Other factors, such as modes of transportation and the age of residents visiting these open spaces, were also included in the study (Peschardt et al., 2012:239). Data was collected by visiting these open spaces. During these visits, the observer observed people visiting the open spaces and handed out questionnaires to these people (Peschardt et al., 2012:240). The goal of the questionnaires was to gather needed information for the case study. This information included the purpose for visiting the open spaces (activities), the age/gender, types of users, time and distance travelled to the open space and mode of transportation (Peschardt et al., 2012:240).

Results were used to assess the linkage between residents and open spaces. The results indicated that people visiting the open space had different reasons for coming to the open spaces (Peschardt et al., 2012:241). Almost 60% of people came to the open spaces for sociocultural functions provided by the open spaces. These functions included socialising, relaxing and recreational purposes (Peschardt *et al*., 2012:242). The other main reason for visiting these open spaces is an economic function, such as a café found in the open space. This factor contributed to an additional 40% of people using the open space (Peschardt *et al*., 2012:242). The case study further determined the mode of transportation respondents used to travel to this open space. The

case study shows that 60% of people visiting the open spaces had travelled by foot, with 20% travelling by bike and the rest by private automobile or public transport. This factor contributed to the accessibility of these open spaces for city residents (Peschardt *et al*., 2012:243). To further assess the accessibility of open spaces in the city, the distance travelled to the open space was considered. 65% of respondents travelled no more than 300 meters to reach the open space, and more than 27% travelled more than 1 kilometre (Peschardt *et al*., 2012:240). The average distance residents were willing to travel is 500 meters to open spaces (Peschardt *et al*., 2012:240).

The case study found that people enjoyed open spaces for sociocultural reasons and that economic functions contributed to their reasons for visiting the open space (Peschardt *et al*., 2012:241). Changing factors such as means of travel and distance to open space had played a role in the frequency of use. As the open spaces had multi-functionality, the frequency of use increased. This is a result of policies set out by the municipality to increase the functionality of open spaces.

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Figure 6-2: Location of Copenhagen, Denmark. Source: Google Maps. 2019.

6.4.2 Case study 2: Achieving design guidelines of neighbourhood open spaces through user's characteristics in different times.

Kalad is an urban area situated in the city of Tehran, Iran. This area was selected due to the availability of open spaces in the urban area. This case study reflects on the importance of planning, designing and managing open spaces in city areas. Users were approached to evaluate how they perceive open spaces and what characteristics of open spaces played a role in their perception (Faizi *et al*., 2011:4004). These open spaces consist primarily of natural aspects and playgrounds for younger users. The evaluation of this study compares the number of users of open spaces with boundaries that the users identified. This acts as a performance indicator for existing open spaces and can provide guidelines for future developments (Faizi *et al*., 2011:4005).

The case study approached people of different ages, gender, marital status, education level and income levels visiting the open space (Faizi *et al*., 2011:4005). The data collection was carried out at different time intervals to ensure the diversity of the respondents approached.

Respondents were also randomly selected for this study (Faizi *et al*., 2011:4006). A correlation between the age of respondents and time of use was identified, indicating that older respondents would visit open spaces during the morning hours and late afternoon (Faizi *et al*., 2011:4006). Families visited the open spaces during the afternoon when children could play outside and use the playground. The case study of Kalad found that the most significant factor in the frequency of use is the distance travelled to the open space and back (Faizi *et al*., 2011:4006).

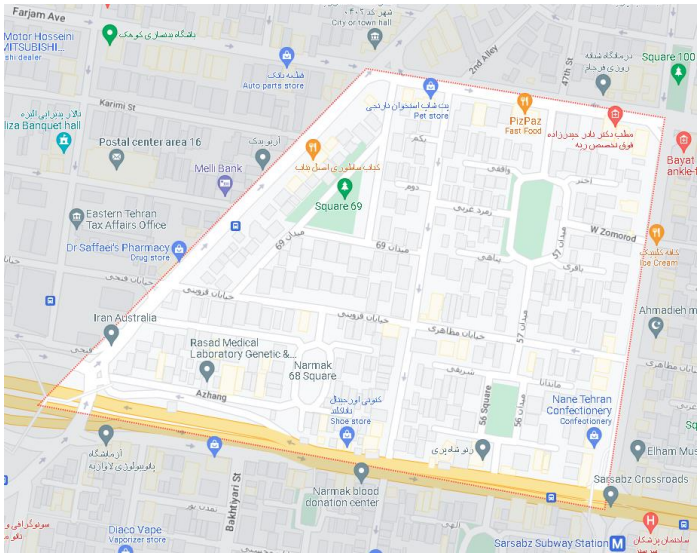


Figure 6-3: Location of Kalad, Tehran

Source: Google Maps. 2019.

The case study concluded that people within a one-kilometre radius were more likely to visit the open space. People within a 250-metre radius would visit open spaces up to 4 times a week compared to people who lived more than a kilometre away, visiting once or twice a week (Faizi *et al*., 2011:4005). Focusing on the characteristics of the open spaces, the location and design of the open spaces played a significant role in the number of people visiting the open space. The people who visited the Kalad open spaces made use of the open space mostly for sociocultural functions provided by the open spaces. These functions included spending time with friends and family in a natural area that gave them peace and relieved stress. The environmental functions, trees, plants and landscapes also played a role in making the open spaces more attractive for people in the city (Faizi *et al*., 2011:4006).

Respondents were also asked how satisfied they were with the open space and its functions. 65% of the respondents were satisfied with the open space, but all agreed on room for improvement (Faizi et al., 2011:4006). Respondents were satisfied mainly with the environmental aspects, such as the nearness to water and a peaceful atmosphere. People are mainly dissatisfied with the open spaces because of poor community services (toilets) and lack of economic aspects (cafés). These factors contributed to people feeling unsafe in these open spaces. Dissatisfaction was increased due to the municipality's lack of maintenance of the open spaces (Faizi et al., 2011:4006). Respondents also asked for a more cultural aspect to be added to the open spaces, such as a library service that examines unique plants. The respondents also said that warm temperatures during the afternoon and inclement weather become a boundary when visiting open spaces (Faizi et al., 2011:4006). The study shows that vegetation, distance and facilities/functions correlate with users' outdoor activities.

Figure 6-4: Location of Kalad, Tehran.
Source: Google Maps. 2019.

6.4.3 Case study 3: Accessibility and usability: Green space preferences, perceptions, and barriers in a rapidly urbanizing city.

This case study was conducted in Santa Cruz, Bolivia. With this being a prominent city, the city experiences rapid urbanisation with uncontrollable development in and around the city (Wendel *et al*., 2012:274). This case study assesses and compares two types of open spaces to determine the open spaces preferences, barriers and perceptions. According to their size, these spaces were divided into urban and neighbourhood parks (Wendel *et al*., 2012:274). Urban parks are enormous parks with more functions, but there are fewer than the number of neighbourhood parks people can visit.

The case study uses observations and semi-structured interviews to collect necessary data. Users were approached to gather different perceptions of the accessibility and usability of open spaces in the city (Wendel *et al*., 2012:278). The first factor was the accessibility to the two different open spaces. The findings suggested that neighbourhood parks were 90% accessible to the total population of the city, and urban parks were 60% accessible to the total population of the city (Wendel *et al*., 2012:278).

Figure 6-5: Location of Santa Cruz, Bolivia.

Source: Google Maps. 2019

These findings were not based on usability and desirability but used a radius metering approach. As the neighbourhood parks outnumber the urban parks, the distance used for neighbourhood parks is smaller than the urban parks. The subsequent response was focused on the preferences of users. In this case, urban parks show a more popular user preference (Wendel *et al*., 2012:279). This is because users are more attracted to larger open spaces with more diverse amenities and functions. The urban parks also contained a more significant number of environmental aspects, such as landscapes and water features. This difference is better explained through the benefits provided by urban parks and neighbourhood parks. Users explained what they desire in open spaces and which type of open spaces benefits them more (Wendel *et al*., 2012:279).

Respondents explained that urban parks provide a better atmosphere, have more functions, and have a more considerable amount of vegetation. Respondents also explained that they would spend more time at the urban parks because of the different amenities that provided an escape from their city lives. Users had a more negative opinion of neighbourhood parks because of their smaller size and fewer functions (Wendel *et al*., 2012:279). However, neighbourhood parks are located closer to users making the distance a preferred option compared with the larger urban parks. Neighbourhood parks also provided amenities for children making it desirable for women to take their children to open spaces. The usability of open spaces also played a role in user

preference due to the availability of transportation to open spaces. Users that rely on public transport to reach an urban park had travel times of 30 minutes up to an hour (Wendel *et al.,* 2012:279). People were willing to walk to open spaces but not for far distances, thus making a neighbourhood park a better option for users.

However, users were willing to travel further distances to reach urban parks because of their preferred factors and multi-functional nature. The last factors influencing user preference are barriers associated with open spaces (Wendel *et al*., 2012:280). Urban parks receive much more improvements than neighbourhood parks. These improvements add factors such as better landscaping, more security and new amenities to the open space. The overall maintenance of these open spaces also played a role in the frequency of users. The respondents described neighbourhood parks as lacking amenities, having poor maintenance and environmental aspects and being unsafe (Wendel *et al*., 2012:280).

Figure 6-6: Location of Santa Cruz, Bolivia.
Source: Google Maps. 2019.

6.5 Conclusion

The three case studies above identify precise components that impact the perception of residents towards open spaces, especially parks. The availability of different and a variety of amenities (functions) plays a impacting role in how the areas are perceived. Residents enjoyed having social interaction at these spaces, while economic functions, such as a Café, further contributed to their enjoyment of the park. Throughout all three case studies, the natural aspects of the open spaces had been critical in the overall satisfaction of residents utilising these spaces. Ecological functionality increased residents' health, mental well-being and calmness, making it a fundamental factor in overcoming the observed constraints of urban development.

CHAPTER 7 SOUTH AFRICA PLANNING LEGISLATION AND POLICY

7.1 Legislation and Policies

The following section will identify and determine the different legislation levels that may impact how urban development is guided within South Africa. Legislation and policy aimed at open space planning will be analysed to determine how it is incorporated into development strategies. National legislation will be studied, including the National Development Plan, Spatial Planning and Land Use Management Act, and the National Spatial Development Framework. From these documents, a South African approach to intensification and sustainable development will become more apparent. The investigation will highlight the approaches to incorporating open space planning into policies and legislation. A more in-depth investigation will be applied to examine the legislative documents applicable at the provincial level.

The Western Cape Province of South Africa is unique in its approaches towards developing an integrated province on national and regional levels. The integration of the province on national scale relates to the interconnectivity with abutting provinces and linkages with South Africa as a nation. The last level of legislation investigation will be purely focused on the George Municipality. The development strategies within the Municipal spatial development Framework will be evaluated, followed by the different Local Spatial Development Frameworks. To further zoom into the urban context, the Pedestrian Network Development Framework applicable to the Central Business District will be evaluated together with the George Open Space System, 2008. Although these documents were not formally adopted, the approach to open space management and compact city guidelines are valuable.

7.1.1 National Development Plan 2030

The National Development Plan sets out Vision 2030 to guide South Africa's development towards a better future and the roadmap to achieve it. The document also shows what the country would have to achieve by 2030 to grasp the long-term national economic, spatial and social objective (SACPLAN, 2013:2). With the goal of spatial transformation, several challenges must be faced in a more environmentally sustainable manner (NDP, 2012:198). The guideline to build sustainable communities is focused on well-structured planning processes, therefore assisting in optimally managing natural resources (NDP, 2012:203). This will contribute to reducing environmental risk while sustaining economic and social goals (NDP, 2012:203). The development of human settlements should be guided by environmental performance as a critical

requirement in sustainable development (NDP, 2012:203). The implication of effective planning provides an opportunity to lessen the impact of providing services on the environmental footprint by applying urban densification (NDP, 2012:203). These services include infrastructure, public transport, access to social services and education. Building vibrant, sustainable communities includes reducing the carbon footprint of transport by locating housing opportunities in close proximity to job creation and implementing urban greening programmes. These factors seek to promote quality living environments for residents located in urban areas (NDP, 2012:203). A holistic approach may be considered by locating housing together with recreational facilities, services and access to retail opportunities (NDP, 2012:204). Transformation zones may act as urban compact initiatives implemented by municipalities to promote densification and urban integration (NDP, 2012:282). The NDP refers to spatial compacts based on the principles of the compact city and urban containment. Principles include "public transport systems", "inner-city regeneration", "measures towards environmental sustainability", and "infrastructure maintenance". The public transport system and infrastructure work together in management systems to provide required services along mobility corridors allocated for densification (NDP, 2012:283). One of the initiatives mentioned in the NDP is to promote densification by considering a subsidy or allowance for such strategies .

Strategies include promoting better-located settlements by developing resource allocation and densification strategies for housing projects. Densification strategies in the NDP seek to strengthen the link between land-use management and public transportation to support mixed-use development. Mixed-use development is characterised by high-density residential opportunities within walking distance of services and transit stops (NDP, 2012:286). On a social scale, the compact environment strives to promote economic and social inclusion, achieve social cohesion and address redress (NDP, 2012:458). The direct mention of open spaces throughout the NDP is limited and mainly focused on providing public facilities for communities. However, the NDP refers to transforming human settlements by increasing access to facilities such as schools, public transport and parks. Increasing parks in urban areas will benefit green infrastructure in cities, enhancing the natural aspect of open spaces. Public health is the responsibility of all residents of urban areas, especially city planning officials (NDP, 2012:335). By providing city functions related to open parks, cycling lanes and pedestrian walkways, the health of residents is improved.

7.1.2 Municipal Systems Act, Act No 32, 2000 (MSA)

The Municipal Systems Act (MSA) adopted in 2000 seeks to provide processes, principles and mechanisms that allow municipalities to develop more resilient social and economic communities.

Access to affordable services for members of the community is promoted. The Act provides an enabling framework for resource mobilising, planning processes, and development of human resources. Social and economic upliftment of communities is sustainably integrated with the local natural environment. The part of the MSA highlighted in this paper focuses on establishing a spatial development framework. Section 25 in the MSA relates to municipalities adopting an Integrated Development Plan (IDP) to create an inclusive and strategic plan focused on the Municipality's development. Section 26 (e) of the MSA dictates the core components of an integrated development plan, including a spatial development plan providing the Municipality's basic guidelines for land use management. A spatial development framework seeks to provide a spatial representation of the core principles contained in the integrated development plan. The planning undertaken in the Municipality must be aligned and complement the development strategies of other state organs. These strategies include the National Development Plan and the National Spatial Development Framework adopted by the national Government of South Africa.

7.1.3 Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013

According to SPLUMA (2013:21), in South Africa, a hierarchy of spatial development frameworks should be prepared in different spheres of government. These SDFs guide the spatial development vision of each more localised sphere of government. The national SDF provides guidelines on a national scale focused on developing South Africa towards an efficient and more sustainable country. The NSDF is informed by the long-term spatial development vision and seeks to guide provincial departments and municipalities in taking decisions (SPLUMA 2013:21). The following level is the Provincial Spatial Development Frameworks (PSDF) developed following the unique characteristics of the different provinces.

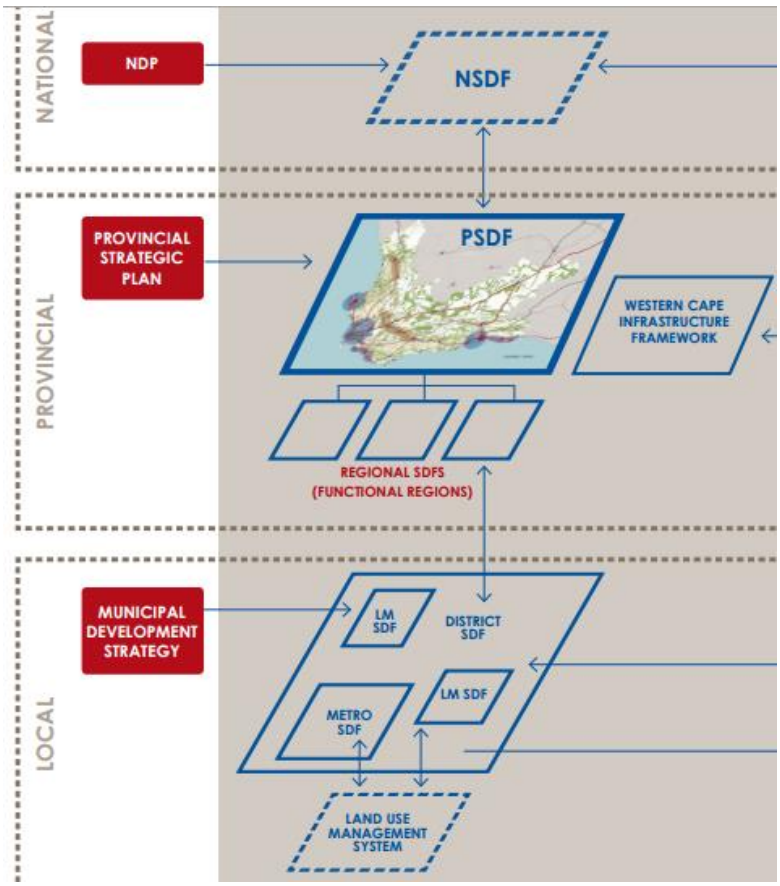


Figure 7-1: Context of different spheres of Spatial Development Frameworks.
Source: Western Cape Provincial Spatial Development Framework, 2014

This paper examines the Western Cape PSDF to gain insight into the uniqueness of the Western Cape as a province and how development is addressed. On a smaller scale , the District Spatial Development Framework is applicable to guide the development of the Garden Route. The Garden Route is located towards east of the Western Cape Province and is also referred to as the Southern Cape. Further, a Spatial Development Framework (SDF) is developed on the municipal level, focused solely on the Municipality's development and integration with surrounding municipalities. The municipal SDF must align, integrate and coordinate policies and plans from different spheres of government (SPLUMA, 2013:23). According to SPLUMA (2013:24), SDFs "must outline specific arrangements for prioritising, mobilising, sequencing and implementing public and private infrastructural and land development investment in the priority spatial structuring areas identified in spatial development frameworks."

In George, a further in-depth Spatial Development Framework is implemented, namely the Local Spatial Development Framework. These LSDFs aim to develop the urban areas within the George Municipality and the George city area.

7.1.3.1 National Spatial Development Framework (NSDF) 2020

The NSDF is a strategic long-term spatial plan for development in South Africa. This document is currently aimed at reaching goals by 2050. The NSDF is legally mandated by the Spatial Planning and Land Use Management Act, 2013 (SPLUMA) (SACPLAN, 2013:1). The document must be aligned with the abovementioned National Development Plan in order to achieve the principles and goals stated therein. When adopted, the NSDF will become South Africa's primary spatial development policy representing the desired spatial configuration of the country (SACPLAN, 2013:1). Spatial directives, together with strategic spatial areas, seek to focus the investment of infrastructure on targeted sectors and areas. Figure 7-2 below provides an ideal spatial pattern for South Africa with National Urban Regions connected by Key National Roads. National protected areas are indicated to ensure safeguarding, while corridors and innovation belts seek to promote further development. The map clearly shows the national priority areas, and George is indicated as a Regional Development Anchor. A Regional Development Anchor is used to describe urban areas with services and facilities that serve the surrounding region.

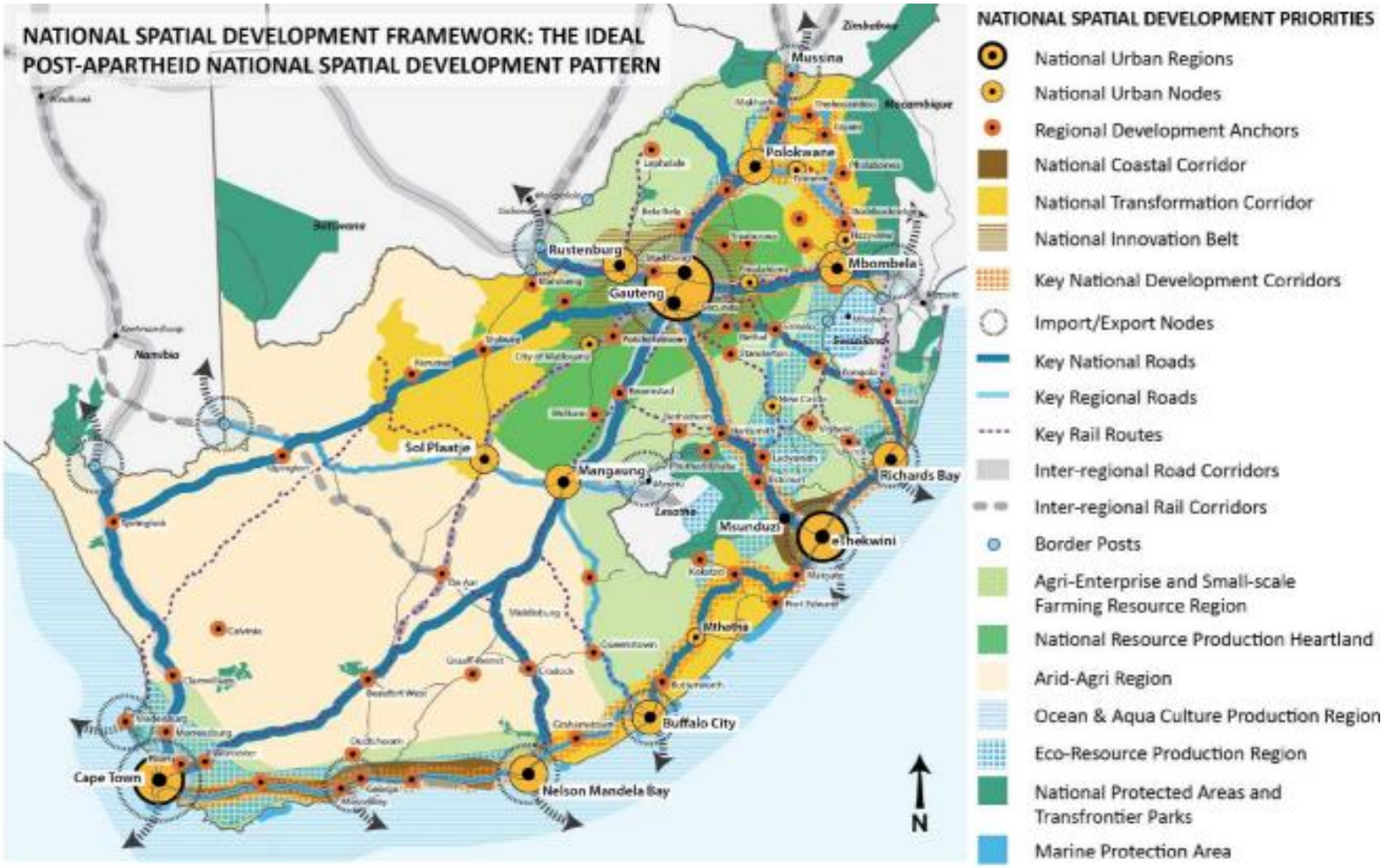


Figure 7-2: The Ideal National Spatial Development Pattern
Source: NSDF (2019:111)

The NSDF defines densification as "The process of increasing the number of people living in a specific area to ensure that (1) better use is made of movement infrastructure, services, ICT networks and amenities by a greater number of people, and (2) the need for expansion of existing grids, networks and services is reduced." NSDF, 2019:15)

Although the NSDF does not particularly define intensification, the word "Diversification" is frequently used and relates to the same objectives. Diversification is defined as "The process of introducing and allowing a greater mix of land uses in an area, (1) to boost local people-to-people service economies, stimulate co-production of knowledge innovation and create jobs, (2) to reduce the need for travel and travel distances, (3) to bring more vibrancy and life to an area; (4) to enhance social interaction and cohesion, and (5) make better use of available land." (NSDF, 2019:16).

Throughout the NSDF several references are made to both densification and diversification as a means to develop both the urban and regional functions of South Africa. The first reference to both these terms is highlighted to create urban and regional areas as engines for inclusive economic growth, national transformation and innovation (NSDF, 2019:93). These factors accelerated growth and development through urbanisation that strives towards a sustainable and shared South Africa. The benefit of urbanisation is related to integrated areas of the country that builds on the resilience of settlements. Large-scale economic growth in urban and regional areas contributes to employment opportunities close to other functions. On a more detailed scale, densification and diversification may create quality public places and more effectively support municipal basic- and social services. Further, the catalyst of nodal development is emphasised to achieve affordable, effective and equitable social service delivery. Nodal development reduces transportation costs and supports urban containment by limiting urban sprawl (NSDF, 2019:96).

The NSDF has little reference to the development of open spaces and how to incorporate them when planning for densification. However, guidance is provided on planning, protecting, and enhancing natural resources and ecological infrastructure. Reference is made to the "system" of natural resources that enables all human life and activities in the country. This system could include all natural areas of biodiversity and ecology, for example, parks, forests, undeveloped land, and water bodies. Emphasis is placed on this system when it states that natural resources should be wisely used, managed and protected (NSDF, 2019:136). In order to protect this system, urban growth and land use of settlements should not compromise or threaten natural areas. Rural areas surrounding urban settlements create a border for natural land and provide important social functions. The rural or undeveloped areas create places of retreat for citizens where they can rest and connect with nature. These areas may hold cultural significance and

create a space away from the fast-paced urban living environment (NSDF, 2019:53). Great caution is emphasised around development that disregards the natural base and damages natural resources to achieve economic development. Industrial and other economic development activities may contaminate water bodies, pollute the air, impede on agricultural land and cause irreparable damage to ecosystems, including biodiversity (NSDF, 2019:54). The NSDF suggests that a choice is made to either cause irreversible damage to the natural environment to promote economic activity and increase national income. Or to protect the natural environment that sustains us and promotes a future that is not harmful to human life. The economic functionality of natural areas can be enhanced by growing the domestic/international tourism destinations and increasing ecosystem health and integrity. These natural areas contribute to the well-being of all residents of urban areas and should be acknowledged and demarcated (NSDF, 2019:54). Municipalities should focus on land use management that protects natural areas, contributes to environmental management and restores disturbed areas.

7.1.3.2 Western Cape Provincial Spatial Development Framework (PSDF), 2014

The Western Cape Provincial Spatial Development Framework will be assessed as the study area of George is located within this province. The provincial spatial development framework (PSDF) of the Western Cape is a long-term spatial framework that is informed by the NDP and includes the strategic context of the province. It seeks to convey the spatial agenda to national and provincial departments to ground sector plans in sound spatial logic (PSDF 2014:14). The PSDF further conveys the agenda of the Western Cape to municipalities to ensure that spatial development frameworks and land use management plans are aligned.

The PSDF sets out three interrelated themes to guide the province's development in different sectors. The three themes are:

- Sustainable use of the Western Cape's spatial assets,
- Opening-up opportunities in the Provincial space economy, and
- Developing integrated and sustainable settlements.

From these themes, a strong emphasis is placed on sustainability in the proposed spatial development strategies. The PSDF recommends incentives to attract economic activity utilising brownfields development focused on densification and mixed-use development (intensification) (PSDF 2014:71). Together with this incentive, the development of a safe public transport system that incorporates densification is emphasised (PSDF 2014:81).

However, achieving densification is complex and clear direction will be required (PSDF 2014:82). The spatial implication of a lack of urban compaction and densification in the Western Cape has negative impacts on livelihoods, the environment and the economy (PSDF, 2014: 83). Policies included in the PSDF that are specifically applicable to this paper are Policy S1 and S3 that include the following (PSDF 2014:84):

- Policy S1: PROTECT, MANAGE AND ENHANCE SENSE OF PLACE, CULTURAL AND SCENIC LANDSCAPES
- 1. “Prevent settlement encroachment into agricultural areas, scenic landscapes and biodiversity priority areas, especially between settlements and along coastal edges and river corridors. (PSDF 2014:84):”
- 2. “Promote smart growth ensuring the efficient use of land and infrastructure by containing urban sprawl and prioritising infill, intensification and redevelopment within settlements. (PSDF 2014:84):”
- Policy S3: PROMOTE COMPACT, MIXED-USE AND INTEGRATED SETTLEMENTS
- 2. “Promote functional integration and mixed use as a key component of achieving improved levels of settlement liveability and counter apartheid spatial patterns and decentralisation through densification and infill development” (PSDF 2014:84).
- 8. “Municipal SDFs to include growth management tools to achieve SPLUMA's spatial principles. These could include: a densification strategy and targets appropriate to the settlement context; an urban edge to protect agricultural land of high potential and contain settlement footprints; and a set of development incentives to promote integration, higher densities and appropriate development typologies” (PSDF 2014:84).

In the PSDF, reference is made to public open spaces (POS) and guidelines are provided on how open spaces can contribute to strengthening the space economies. Appropriate social services, infrastructure and facilities should be provided in regional economic centres by promoting non-motorised transport, different housing typologies and public open spaces (PSDF 2014:71). Further the PSDF (2014:39) seeks to preserve natural landscapes and their unique typologies by capitalising on character and sense of place. An interdependent relationship between natural and social capital is emphasised as one cannot be substituted by the other.

The PSDF refers to George as a Regional Centre in the Western Cape, as illustrated in Figure 7-3 below. Reference is made to implementing an integrated urban space and public transport program in the George city area. Both public transport infrastructure and the importance of investing in complementary non-motorised transport infrastructure are highlighted (PSDF 2014:63). The importance of George as a regional economic node is emphasised throughout the

document. Guidelines support its potential for further development (PSDF 2014:59). Emphasis is placed on managing the protection of valued resources and landscapes in the face of urban growth pressures in the George area (PSDF 2014:91).

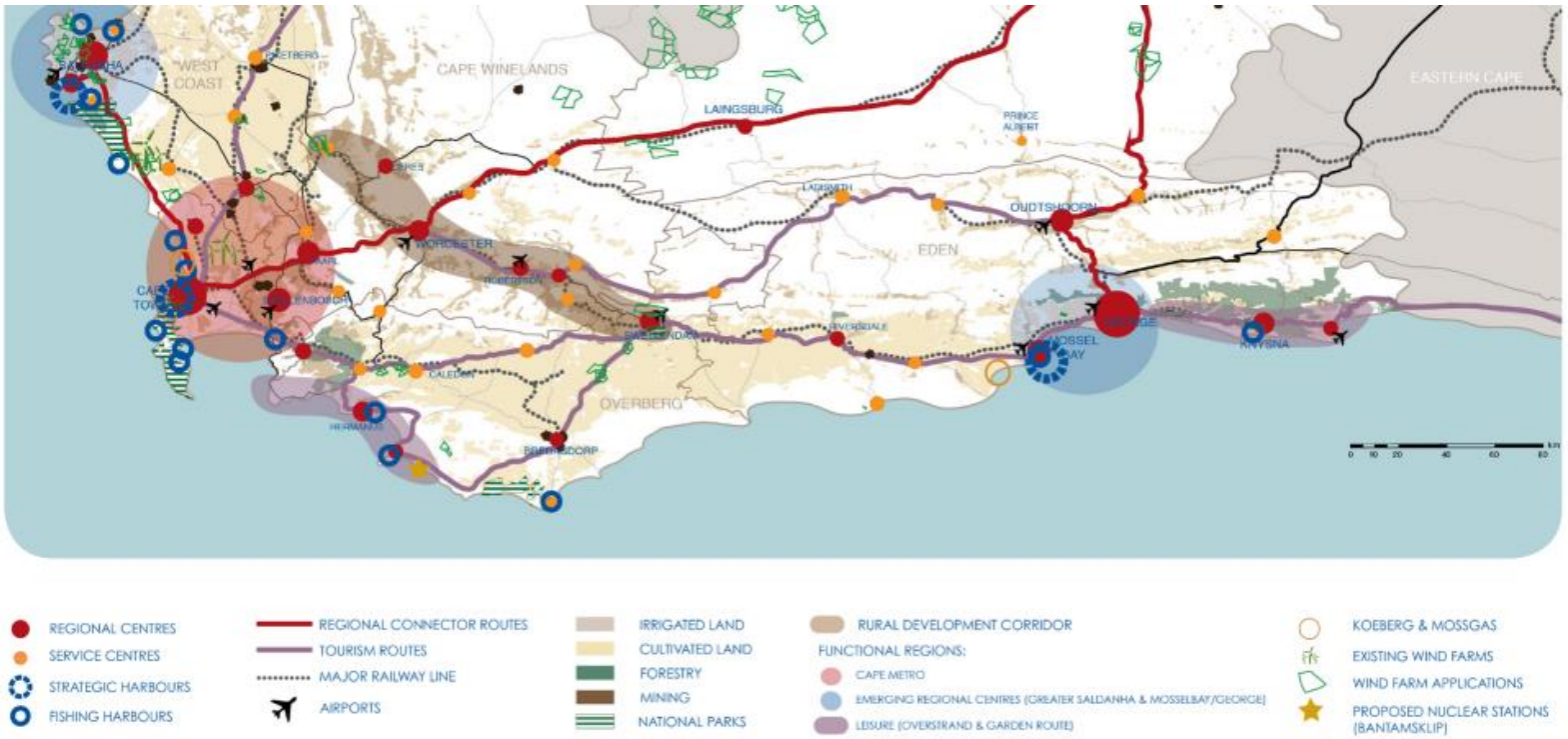


Figure 7-3: Western Cape Space-Economy Synthesised

Source: Provincial Spatial Development Framework, 2014:73

7.1.3.3 Garden Route (Southern Cape) Regional Spatial Implementation Framework, 2019

The regional spatial framework was created to give effect to the PSDF spatial plans for urban priority areas in the Southern Cape, also referred to as the Garden Route. The Garden Route district stretches from Hessequa Municipal boundaries up to the boundaries of Bitou local Municipality. Including large towns such as Heidelberg, Mossel Bay, Oudtshoorn, Knysna, Plettenberg Bay and finally, George. The Spatial Framework of the Garden Route (GRRSIF) sets out core objectives to increase inter-municipal growth and development opportunities (GRRSIF 2019:1). These opportunities focus on an integrated regional approach to sustainable development and management strategies. One of the framework's values (Regional Value 3) is people-centred quality development with equitable access, spatial justice and efficiency. This vision is achievable by integrating and densifying settlements, promoting compaction and mixed-use quality urban environments (GRRSIF, 2019:40). A fundamental resource applicable to regional value 3 is the natural environment resulting in a Key Regional Issue C(3). Due to increased demand for water and degraded river and wetland areas, the region's water security

has decreased (GRRSIF, 2019:36). The poor management of natural environments in urban areas has a further negative impact on the economic and social development potential (GRRSIF, 2019:36). Due to poor quality open space systems in urban areas inadequate access to environmental resources is provided. Environmental resources facilitate economic development and growth (GRRSIF, 2019:36). A further statement by the GRRSIF (2019:40) is the poor quality of public open space in "most" urban areas. This poor quality results from population growth pressures and historic apartheid planning that provided little investment in poor areas (GRRSIF, 2019:36).

Regional Value 3 of the GRRSIF (2019:69) sets out several policies that promote a sustainable and compact urban environment for people-centred development. The following are included in the people-centred regional policy:

- PC1): Regional public transport access & connectivity
    - Develop and implement an affordable inter and intra-regional public transport service for the Garden Route
- PC2): Town revitalisation & commercial incentivisation
    - “Develop and implement town centre revitalisation plans with the goal of reinvigorating these places of economic opportunity and growth & improving ICT and Wi-Fi access, as well as providing other incentives for business to operate in these areas, as well as disincentives for commercial decentralisation in the region” (GRRSIF, 2019:58)
- PC3): Regional Densification
    - Develop appropriate, credible and implementable Spatial Development Frameworks for all local and district municipalities in the region.
- PC4) Regional vacant land optimisation
    - “Undertake vacant and underutilised land audits for all land within or in proximity to the major settlements of the region, and unlock well-located land, via development facilitation and property development unit, for development by providing a suite of desirable rights and all relevant authorisations and infrastructure support for development in these land parcels, incentivising spatial justice and efficiency” (GRRSIF, 2019:58).
- PC5) Mainstreaming disaster management in regional thinking

- “Embed disaster management in all planning and delivery mechanisms for land development and infrastructure, specifically as it relates to climate change risks, flooding, and fire events.” (GRRSIF, 2019:58)

Figure 7-4: Spatial Planning proposals for the Garden Route

Source: Garden Route (Southern Cape) Regional Spatial Implementation Framework, 2019

The above map extracted from the GRRSIF was also included in the Eden Spatial Development Framework, 2017. It visually illustrates the different urban centres in the Garden Route and categorises them according to growth management. On this map, George is indicated as a Grow Coastal Centre located along the National East-West Route. Throughout the document, several references are made to settlements along the coast and how they should be strategically developed. A clear strategy is refraining from coastal-strip development that contributes to the eroding of landscape character and economic vitality (GRRSIF 2019:36). As George is located along the East-West Route, opportunities exist for transport for both community and tourism purposes (GRRSIF 2019:40).

In the GRRSIF, a vision for 2040 is set out for the Southern Cape Region, including development strategies that will increase sustainability. Through promoting compaction, increasing continuity and developing mixed-use, the quality of urban areas could be dramatically increased. The quality of these urban areas depends on their efficiency, including integration and vitality (GRRSIF 2019:49). Priority should be given to urban environments with quality green open spaces that build on the competitive advantage and character (GRRSIF 2019:49). This vision includes an impact on the financial sustainability of municipalities as infrastructure use is optimised and maintenance is improved (GRRSIF 2019:49). Financial sustainability is dependent on both public and private investment focussed on integrating and densifying settlements. The approach to achieving this vision may impact the financial sustainability of municipalities (GRRSIF 2019:51). The vision's goal emphasises reversing the apartheid spatial urban form by consolidating urban environments and dignifying places (GRRSIF 2019:51).

Inappropriate urban development is highlighted in the GRRSIF (2019:58) as development that sprawls into environmentally sensitive land and diminishes prime agricultural land. One negative impact is the decrease in food security and the undermining of the Municipality's financial sustainability (GRRSIF 2019:58). Increased pressure for the development of low-density high-income housing undermines development strategies known as compaction and densification that may result in the loss of landscapes of scenic value (GRRSIF 2019:58).

7.1.3.4 George Municipal Spatial Development Framework 2019 (GMSDF)

The overall purpose of the MSDF is to guide development within the George municipality. The MSDF is a visual/physical representation of the goals and policies set out by George's Integrated Development Plan (IDP) (GMSDF 2019:8). Thus, it spatially illustrates areas where development may occur and the preferred land uses. The guidelines set out by the MSDF may not be law, but the guidelines encourage preferred types of development and promote favourable characteristics within the development (integration, sustainability, functionality). In the broader legislative context, the MSDF acts as a bridge between the policies/guidelines set out by National and provincial planning departments/councils (SPLUMA, LUPA, PSDF, Rural Guidelines.) and the implementation thereof within the George Municipality. The MSDF does not simply implement policies; it examines these policies and interprets them to make them applicable to the unique character of the George Municipality (GMSDF 2019:26). Thus, the MSDF sets out its own policies and guidelines to steer development based on national and provincial policies.

Several policies are aimed at the strategy of urban densification by focusing on the factors that promote this strategy. Increasing the number of residential opportunities per hectare is a primary policy in this strategy. Providing more opportunities within close proximity allows for more efficient

use of services and infrastructure (GMSDF 2019:62). The focus of densification is spatially centred within urban nodes and along corridors that can accommodate the increase in residential opportunities. Concerning the composite spatial development framework map indicated in Figure 7-5, the development strategies are spatially illustrated in the George city area. In this regard, the GMSDF sets out a 500m catchment zone for land use intensification along the primary corridors in George (GMSDF 2019:62). These corridors include York Street, Courtney Street, Knysna Road, Beach Drive and Nelson Mandela Boulevard. This strategy encourages increasing residential opportunities and promotes mixed land use development. These areas can act as economically viable and social interaction zones that promote increased efficiency. This efficiency is measured by walkability, affordable housing and jobs/employment opportunities for residents (GMSDF 2019:66). This area further promotes the five principles of a sustainable urban environment where residents can work, play, relax, live and shop.

A further strategy is the CBD high/medium densification zone illustrated in the CBD and George South area by a yellow hatch. As densities increase, the pressure on transport infrastructure will also increase. The relationship between densification and transport infrastructure is significant. Densification may increase the need for public transport (GMSDF 2019:30). Along the indicated activity corridors, transport infrastructure should accommodate an increase in densities. The focus is primarily on the provision and access to public transport. This is achieved by increasing the number of bus routes, and bus stops, transfer stations and access to busses (GMSDF 2019:39). To further lessen the pressure on transport infrastructure, the GMSDF sets out policies to improve walkability and the use of bicycles by providing bicycle lanes and broader pedestrian walkways. On the map below, a proposed integrated open space is indicated that promotes NMT (Non-Motorised Transport) (GMSDF 2019:39). The increase in the number of transport modes contributes to the efficiency of transport infrastructure and the viability of development strategies. The well-being of people living in areas that promoted densification and a variety of transport options is increased. A strong relationship between these factors seeks to overcome spatial barriers by increasing residents' access to social amenities and services (GMSDF 2019:47). This may promote a more liveable urban area for residents, enhancing their sense of place.

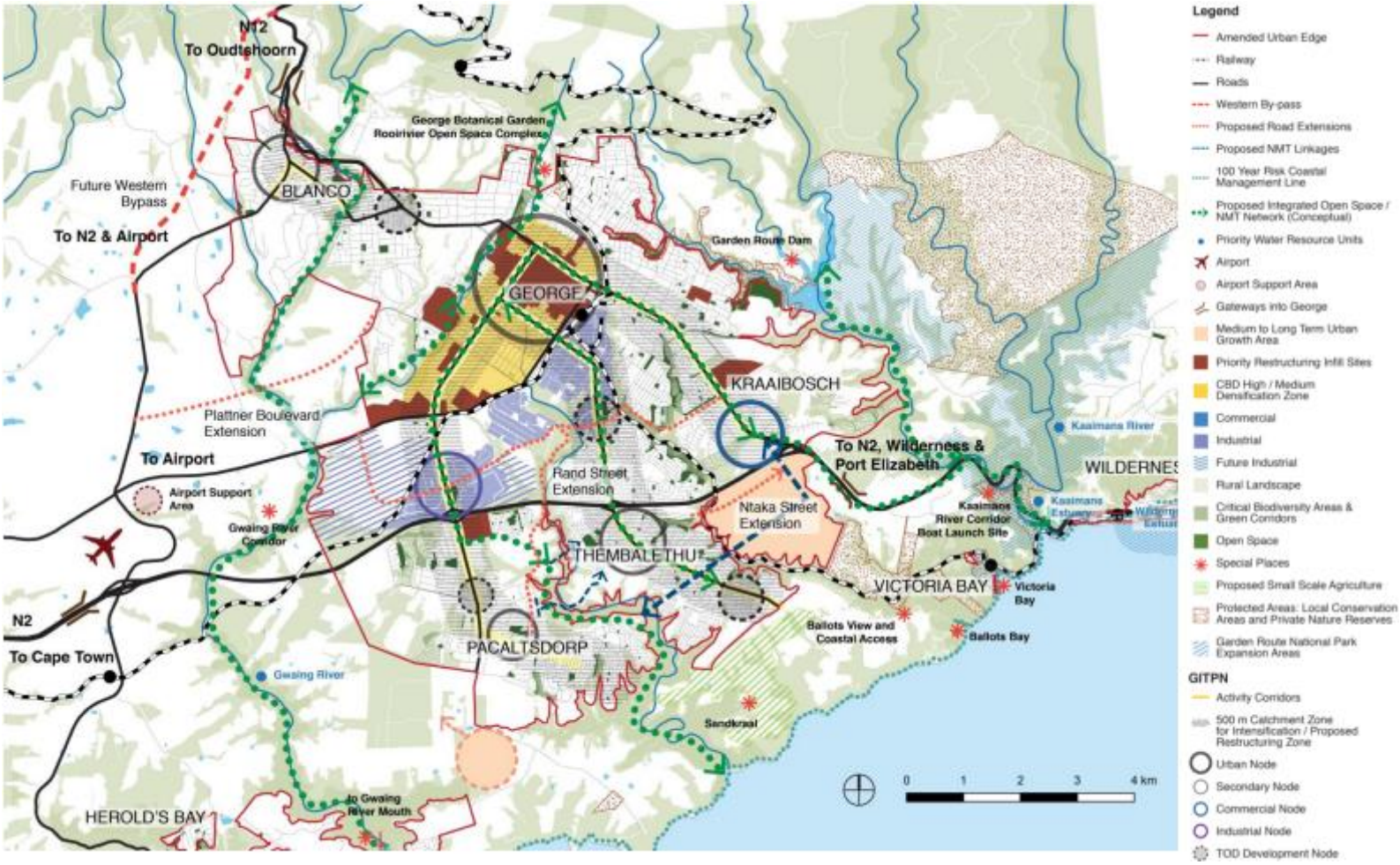


Figure 7-5: Composite Spatial Development Framework for the George City Area
Source: George Municipal Spatial Development Framework, 2019

Throughout this GMSDF, the importance of providing open spaces for residents is lacking, and without more detailed policies, their incorporation becomes difficult.

Policies contained in the GMSDF that seek to promote development strategies and protect open spaces are listed below:

- Policy A3: “Enhance public transport and non-motorised transport connectivity within and between settlements regionally and within the George city area” (GMSDF 2019:53).
- Policy A4: “Provide and maintain a high quality, safe open space system by maintaining the integrity of existing spaces and actively seek to link viable open spaces into a continuous green web that, with the public transport corridors, forms the basis for the nonmotorised transport network” (GMSDF 2019:53).
- Policy C: “Maintain a compact settlement form to achieve better efficiency in service delivery and resource use, and to facilitate inclusion and integration.” (GMSDF 2019:52).

- Policy D: “Manage the use of land in the Municipal area in a manner which protects natural ecosystem functioning and values ecosystem services, respecting that these are assets that underpin the economy and settlement and their resilience.” (GMSDF 2019:70).
- Policy F: “Manage the growth of urban settlement in George to ensure the optimum and efficient use of existing infrastructure and resources and in turn, secure the Municipality's fiscal sustainability and resilience while preventing further loss of natural and agricultural assets.” (GMSDF 2019:97).
- Policy G1: “Promote walkability within the intensification zone and especially within the priority nodes” (GMSDF 2019:102).
- Policy H: “Celebrate built heritage assets in a manner that contributes to renewal, urban quality and opportunity” (GMSDF 2019:108).

The policies included above seek to manage the development of George in a manner that promotes the liveability of the urban- and surrounding rural areas. These policies' primary goal is to promote sustainable development while incorporating natural components. Policies strive towards developing George according to the vision of "A City for a Sustainable Future" and achieving the strategic goals. The strategic goals include developing George, ensuring safe, clean, green development, affordable services, participative partnerships, and good governance (GMSDF 2019:19).

7.1.4 Local Spatial Development Frameworks (LSDF)

The LSDFs of George Municipality are used to provide more detailed approaches to development within the functional areas. These documents focus on specific policies in the GMSDF applicable to properties located in each demarcated area. The George Municipality has 12 LSDFs that guide development in areas such as Wilderness, Blanco, Central Business District and Pacaltsdorp. For this paper, only LSDFs located within the study area have been evaluated for their strategies on densification and the provision of open spaces. Primarily the LSDF for the Central Business District will be evaluated together with the Pedestrian Network Urban Design Framework Recommendations. The LSDFs focus on the core development of the George City area, relating to densification and intensification zones. The Pedestrian Network document further seeks to promote access through linkages and the use of public areas such as open spaces. An additional LSDF is the George South-East Local Spatial Development Framework document. Although this LSDF focuses primarily on residential neighbours, a section along Knysna Road applies to the study area later in this report.

7.1.4.1 Central Business District Local Spatial Development Framework, 2012

One of the key strategies to guide development within the CBD is using the Medium-Term-Business and High-Density Residential Development Edge. Figure 7-6 below spatially represents these strategies utilising a yellow and orange line. These edges are used as an urban planning tool to guide development spatially. Development of business land uses and high-density residential areas are restricted within the edges inside George's Central Business District (CBD LSDF, 2012:19). These edges protect the surrounding single residential character from intensive development that may negatively impact houses and families (CBD LSDF, 2012:19). Additionally, the strategy of redeveloping large built/urban blocks assists in increased intensification within these edges and attempts to use space more efficiently (CBD LSDF, 2012:20). This redevelopment of urban blocks provides for open spaces in-between urban blocks and improves accessibility.

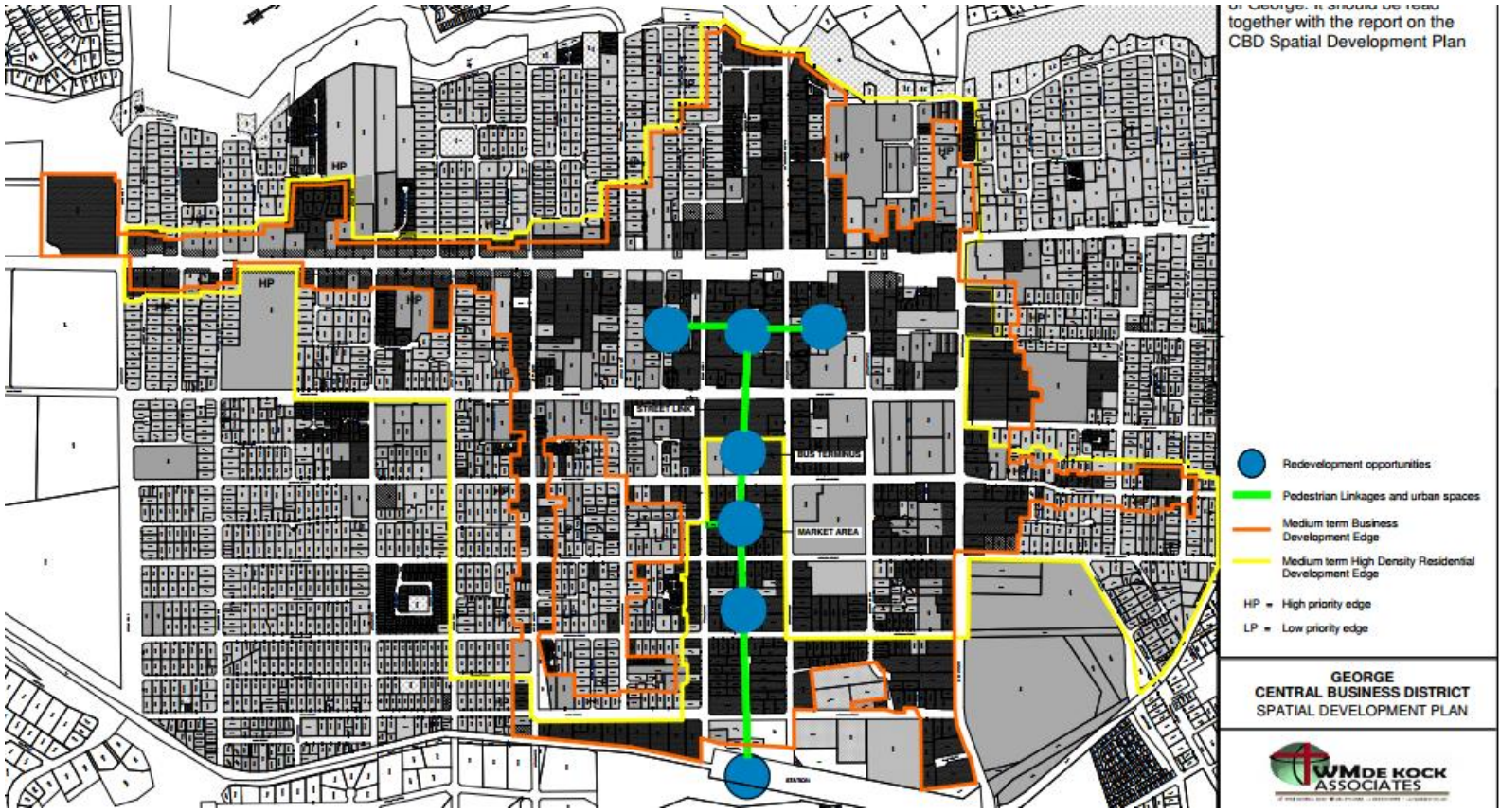


Figure 7-6: Spatial Development Plan for the George Central Business District

Source: CBD Local Spatial Development Framework, 2012

The purpose of providing these open spaces is to generate pedestrian-friendly environments for increased walkability (CBD LSDF, 2012:26). A complementary strategy is the widening of sidewalks and creating linkages through urban spaces (CBD LSDF, 2012:9). Improving walkability and promoting pedestrian-friendly streetscapes relate to corridor development in and

around the CBD (CBD LSDF, 2012:28). By increasing walkability throughout the CBD, increased access to services, amenities and facilities is being promoted and the wellbeing of residents is enhanced.

The LSDF and Pedestrian Network set out several Spatial Management Tools to support densification and the development of an open space system. One of these is identifying the business node (CBD LSDF, 2012:4). This specific tool is used to direct development towards a specified area to develop and concentrate businesses. Public and private investment could be directed to this node by demarcating a specific area for business development.

The second spatial management tool in the densification report uses planning precincts, referred to as densification zones 1 to 12 in the report (CBD LSDF, 2012:40). The tool is used to develop demarcated areas according to applicable constraints and objectives. This is a valuable tool for developing urban areas according to their character, for example, a commercial or strictly residential precinct. The third spatial management tool is the use of activity streets/corridors. This spatial management tool refers to a street or road that has a mixture of land uses and contributes to different uses (CBD LSDF, 2012:26). In these streets, different commercial, recreational and residential opportunities are located, contributing to mixed-use development. An example of an activity street is the oldest road in George, York Street. This spatial management tool ties in with the Local Spatial Plan by identifying streets promoting mixed-use development and densification. The location of these activity streets is ideal as their proximity to the CBD Core encourages integration (CBD LSDF, 2012:26). Identifying the importance of these activity streets investment may be focused here to increase efficient development.

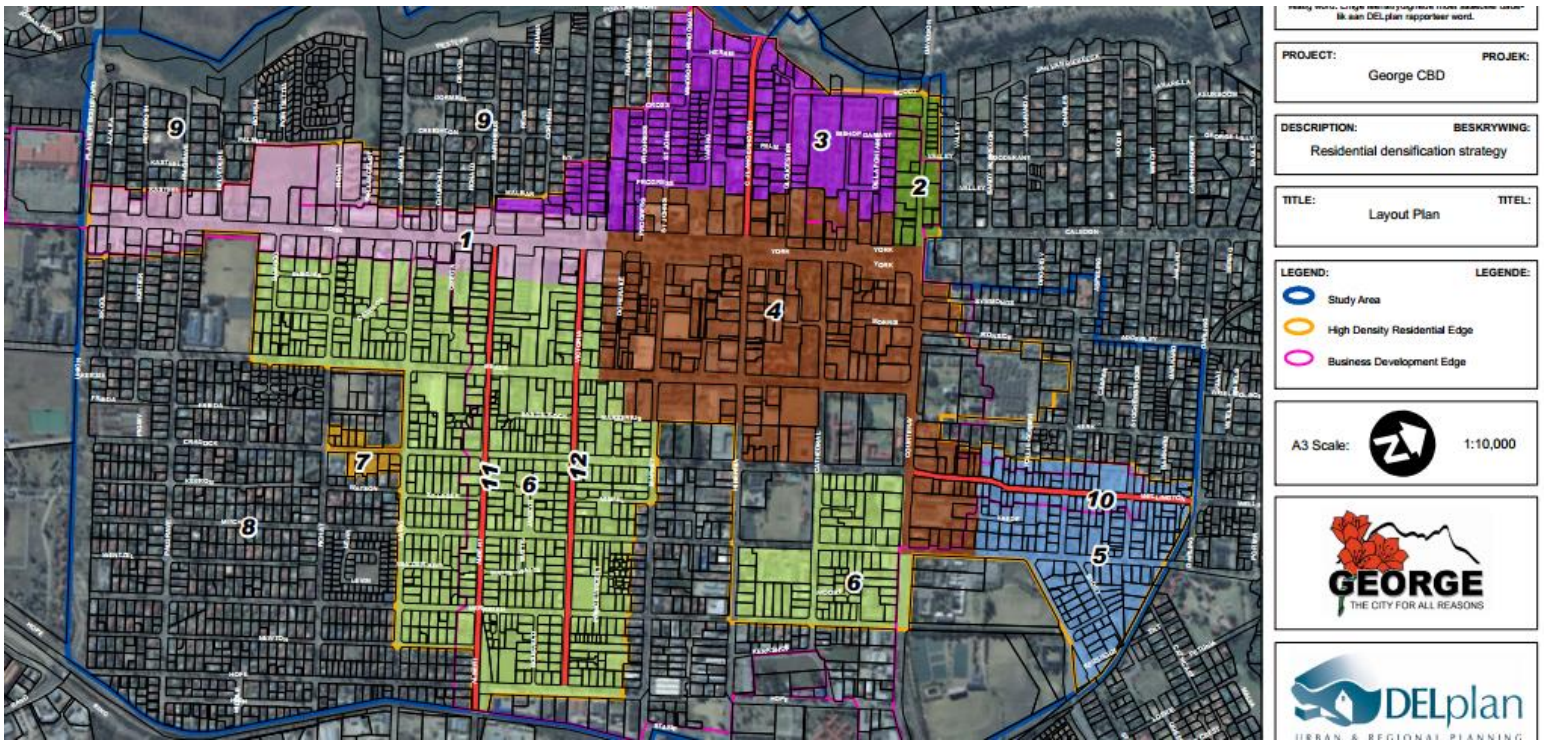


Figure 7-7: Residential Densification Strategy

Source: CBD Local Spatial Development Framework, 2012

The development of an open space system is one of the priorities listed in the CBD LSDF. This factor is crucial for a balanced, sustainable city. It will benefit both urban and natural environments (CBD LSDF, 2012:26). In terms of social aspects, an open space system will provide residents with places of leisure, relaxation and natural beauty. This system can further promote walkability in the CBD area, as residents will not have to walk along busy roads. Sidewalks could be broadened to incorporate more trees, grass and street furniture for residents to make walking through the CBD area relaxing and beautiful (CBD LSDF, 2012:26). Emphasis is placed on the natural aspects of open spaces as the essential part of having an open space system. The open space system will help mitigate climate change in and around the CBD area. The natural factors regulate the urban heat island effect and reduce stormwater runoff, air pollution and water runoff (CBD LSDF, 2012:27). This system may similarly lead to the reduction of energy consumption, as trees contribute to regulating temperature. This system could also assist in protecting water courses and river corridors. When focusing on the CBD itself, an open space system will contribute to the unique character of the CBD. It may create a more aesthetically pleasing streetscape (CBD LSDF, 2012:27). The open space system could further incorporate heritage sites to increase their unique value and character. Buildings could be designed to be integrated into the open space system to further increase biodiversity and ecological functionality. Open

spaces may further contribute towards economic vitality for the CBD. Such vitality could include attractions based on ecologically sound economic development initiatives (CBD LSDF, 2012:27). Open spaces can be utilised for informal trading markets, "boeremarkte", and restaurants can provide tables in the open spaces for customers.

The following points included in the Pedestrian Network Urban Design Framework Recommendations (PNUDFR) focus on open space and development strategies:

- The pedestrian network report identifies open spaces to be protected and enhanced for public use. Open spaces receive barriers that protect them from any built development occurring within them.
- Open spaces in midblock can be opened up to form part of a green network and benefit the community.
- Principle 1 sets out to support the vision that focuses on creating development that contributes to creating a continuous/linked network of open spaces and public streets. Streets can act as corridors that spread natural functionality (PNUDFR, 2015:63).
- Principle 2 further supports the creation of open spaces that are safe, well-used and accessible to the public. These open spaces can incorporate historical elements and other green spaces located throughout the city.
- Principle 3 emphasises the reduction of vehicular access and movement. This will increase pedestrian- and public transport movement.
- Principle 4 relates to urban form that should be fluent and respond to the surrounding area. Appropriate building heights, development edges and scaled development are encouraged.
- Principle 5 reflects the intensification strategy mentioned above as it promotes vibrant mixed land-use development. These developments should support the separate precincts' characters, roles and functions.
- The Design principles set out in this document seek to guide development within the network and provide support to the overall vision:
    - 01 Function: accommodating a range of activities and uses within squares;
    - 02 Continuity: create a continuous/ linked system for pedestrian movement that is safe;
    - 03 Legibility: to ensure pedestrians can easily navigate through this system by means of urban furniture;
    - 04 Equal Access: all residents to have access to and from the network to ensure continuity;

- 05 Interface: to integrate buildings into the system to increase pedestrian safety and provide active structures;
- 06 Planting and Landscaping: to further improve the natural functionality of the network through preserving trees and supplementing with indigenous vegetation;
- 07 Management: public space system must be managed to ensure safety, cleanliness and appeal. The possibility of a City Improvement District is stated;
- 08 Public ablutions facilities: provision of ablution facilities for residents that surrounding property owners manage;
- 09 Parking: parking to be provided in parking garages and basements in order to reduce space occupied by vehicles and to allow current parking to become parks;
- 10 Heritage: acknowledge the richness of heritage sites and the value it brings to the CBD;
- 11 Mid-block permeability: allow pedestrians to walk freely through midblock and pedestrian-orientated routes. This may provide new opportunities for businesses;

Figure 7-8: Proposed 10 Precincts of the Pedestrian Network Urban Design Framework Recommendations
Source: Pedestrian Network Urban Design Framework Recommendations, 2015

The Pedestrian Network identifies a total of 10 precincts that relate to the pedestrian network recommendations. The figure above illustrates these precincts spatially and briefly describes each. The identified precincts relate to the possible redevelopment opportunities indicated in the LSDF map in Figure 7-6 above. Each precinct has its unique recommendation on development strategies and the possibility of open space development.

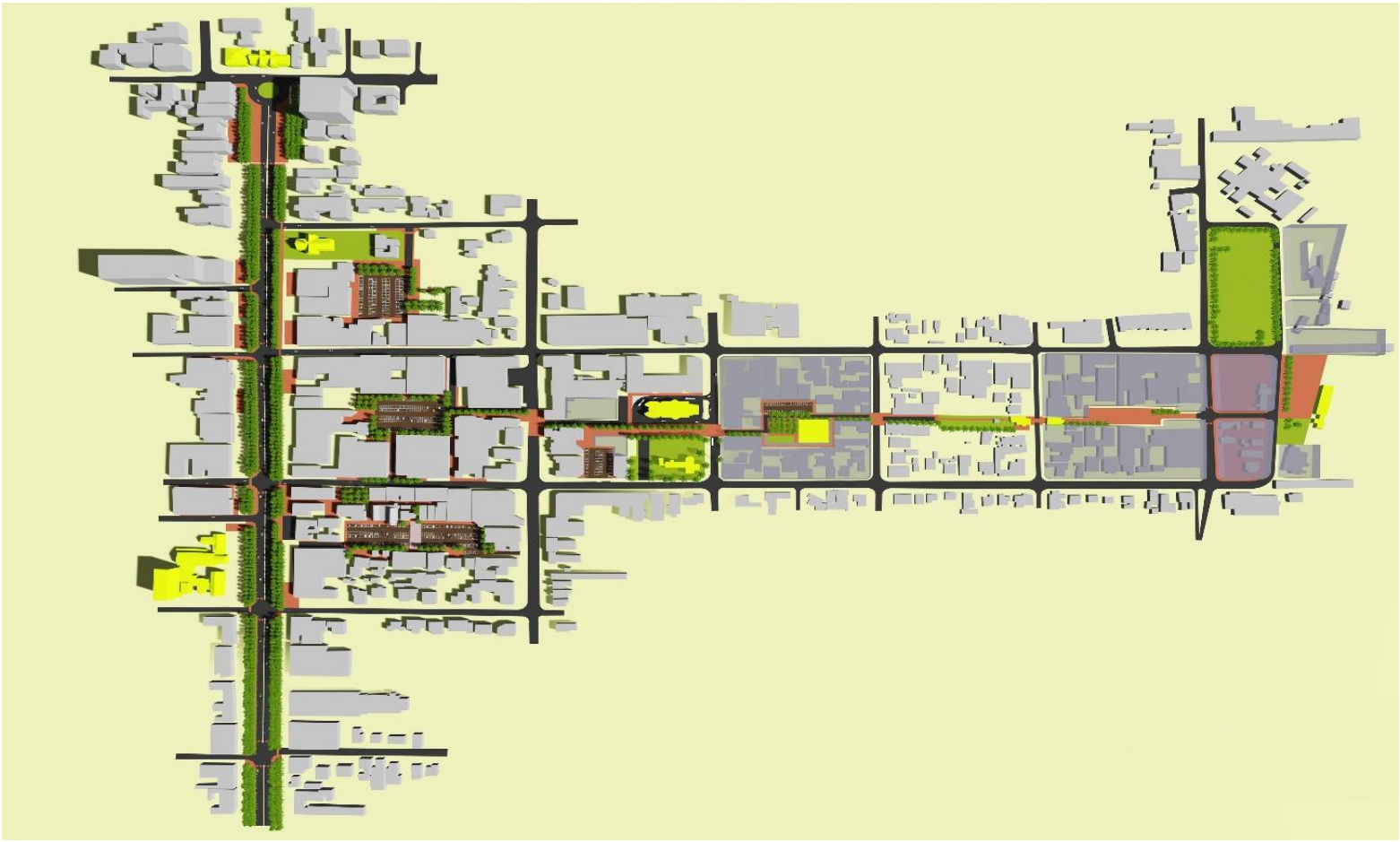


Figure 7-9: Pedestrian Network Urban Design Framework Recommendations 3D Map
Source: Pedestrian Network Urban Design Framework Recommendations, 2015

Together with the precinct map Figure 7-8 above, a 3D map has been included to provide a top-view illustration of the proposed pedestrian network. A clear indication of the different precincts is evident on the 3D map, as is the proposed greening to accompany the network. The proposed York Street boulevard is more apparent in the 3D map than in the precinct plan above.

7.1.4.2 Local Spatial Development Framework for George South-East, 2015

During public participation in drafting the Integrated Development Plan, several needs and constraints were highlighted by the community in the demarcated area. These needs included the requirement of a development strategy for the area that will lead to the establishment of the current LSDF for George South-East. The George South-East LSDF contains seven residential neighbourhoods, industrial land uses, and a large portion of vacant land known as Remainder Erf 464, George. The developable area is restricted by river valleys and steep slopes (LSDF South-East, 2015:21). Residential areas consist mainly of subsidised housing and informal settlements. A survey conducted indicated that up to 41% of the families in this area reside in shacks (LSDF South-East, 2015:23). A dire need for a variety of housing opportunities was emphasised together with an increased number of facilities and open spaces for recreational purposes (LSDF South-East, 2015:28). Lack of transport efficiency and modes of transport was highlighted, and a need for a bus system and clearly defined walkways expressed (LSDF South-East, 2015:29).

Development strategies included in the South-East LSDF set objectives to achieve the needs mentioned above. These objectives included the following:

- Creating an urban environment worthy of all people living there with opportunities for residential, economic and recreational activities;
- Increased access to land for residential and businesses;
- Provision of required services within walking distance and access to public transport;
- “Utilise the recreational possibilities of the river valleys in the area.” (LSDF South-East, 2015:30)

From the abovementioned objectives, proposals for development strategies were formulated. The first was an urban renewal proposal that focused explicitly on the George Sout-East area. Urban renewal seeks to provide integrated sustainable neighbourhoods that include relevant components (LSDF South-East, 2015:33). Components for urban renewal are directly related to the objectives as stated above, including a variety of residential opportunities, access to services and space for recreation. Promoting mixed uses is a development proposal, including a combination of different uses located in a suitable area (LSDF South-East, 2015:45). A development strategy that contributes to the objectives above is the development of an open space system. This system includes river valleys, play parks, formal squares, sidewalks and streets safe for human movement (LSDF South-East, 2015:47). Sidewalks and streets are included as residents of the demarcated area are "keen" on using these areas for social activities

(LSDF South-East, 2015:47). The guidelines to create an open space system included in the South-East LSDF are listed below:

- Areas that have not undergone development to be retained as open space and included in this integrated system.
- Open space design should be human-friendly.
- River valleys are to be developed following the Draft George Open Space Policy dated 2008 (that will be described below).

The map below illustrates the George South-East LSDF. Proposed urban Renewal projects are indicated as red-hatched areas and open spaces as two different green zones.

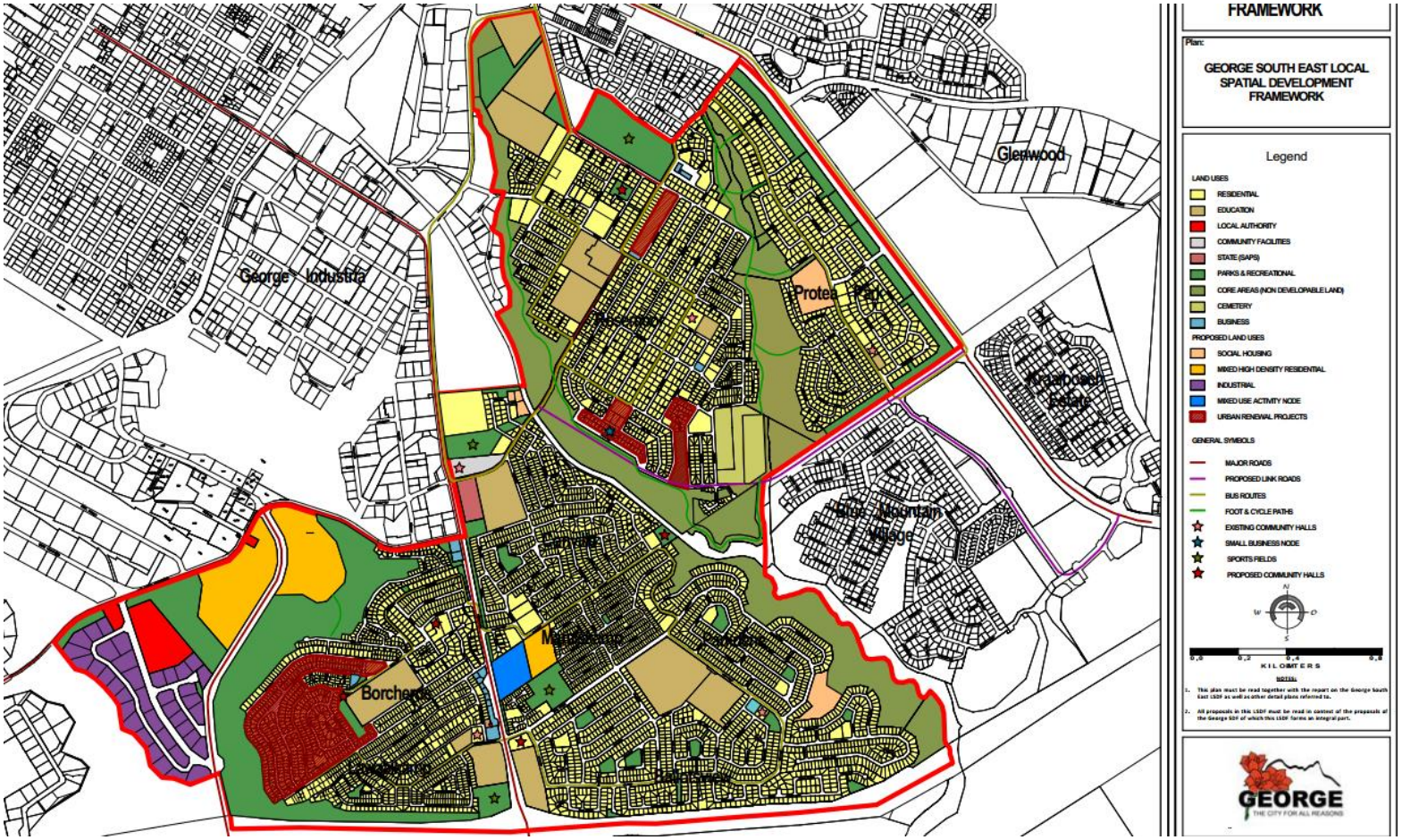


Figure 7-10: George South-East Spatial Development Framework
Source: Local Spatial Development Framework for George South-East, 2015

7.1.5 George Open Space System, 2008 (Draft)

The George Open Space System (GOSS) was drafted in 2008 as part of the George Spatial Development Framework for the George and Wilderness area. It was, however, not adopted by the council after the required research and investigation were conducted. The document contains substantial information regarding open spaces in George and proposed recommendations for

developing George as a "Garden City". For the purpose of this paper the document is evaluated on specific objectives for open spaces, together with the general objectives for open spaces in the CBD. Further evaluation of proposed projects and tasks is included to identify potential strategies in the recommendations section of this paper.

The GOSS starts by highlighting the importance of open spaces within George and seeks to create open spaces that are functional, integrated and safe. Further, the paper identifies three main issues raised by Barrie Gasson regarding the expansion of urban areas. Ecological overshoot, land consumption and loss of sense of place contribute to the depletion of resources, conversion of natural land into urban areas and qualitative deterioration of identity. A pivotal threat to open spaces is the fragmentation of natural areas within the George area.

7.1.5.1 Proposed recommendations for open space in George according to the GOSS

Chapter four of the GOSS includes recommendations focused on planning George as a Garden city, objectives for open spaces in the CBD and specific objectives for open spaces. One of the key aspects included is to develop open spaces in densification areas (GOSS 2008:25). By creating green corridors and functional linkages between open spaces, the sense of place and tourism potential is increased. Development designed with natural elements and landscaping benefits open spaces and the sense of nature in the urban environment (GOSS 2008:25).

Focussing on the CBD of George, the integration of structures and engineering services with the natural landscape creates a unified urban form (GOSS 2008:25). Ensuring aesthetically pleasing landscapes are promoted, the connection between communities and the environment is enhanced. This will improve recreational spaces and reduce pollution within the urban environment. Effective management of open spaces and natural areas increases ecological functionality and reduces carbon emissions (GOSS 2008:25). Maximising ecological benefits of the urban area by enhancing biodiversity and conservation of natural habitats. As described above, an objective of the CBD directly related to multifunctionality is ensuring that open space contributes to economic vitality (GOSS 2008:25). Such initiatives may be based on ecologically sound economic development strategies. Increase the functionality of open spaces to contribute to managing stormwater (GOSS 2008:25).

Specific objectives for existing and proposed open spaces are based on functional open spaces planning and increasing the ecological functionality of the urban area. Creating linkages between open spaces through river corridors is a primary objective highlighted in this chapter (GOSS 2008:28). Areas identified as undisturbed and consisting of indigenous vegetation should be retained and protected to enhance the sense of place. Natural areas of lower ecological value

should be considered for recreational development, including parks and sport facilities (GOSS 2008:29). The heritage avenue, Meade Street, should be improved and protected from the degradation of value and sense of place (GOSS 2008:32). The GOSS seeks to increase the value of open spaces by suggesting agriculture in open spaces (GOSS 2008:34). The possibility of creating a biodiversity node in areas of the Schaapkop River is highlighted due to heritage significance and tourism potential (GOSS 2008:35). Further emphasis is placed on rehabilitating natural areas that were disturbed and used for pine plantations (GOSS 2008:37). The Pacaltsdorp open spaces amphitheatre will include additional functions to increase vitality and use (GOSS 2008:40).

With the objectives mentioned above, the GOSS proposes recommendations regarding open spaces. The following list was proposed according to open space recommendations:

- Parks should be assessed individually and designed according to the different needs of communities. Public input will be the cornerstone of such design.
- Interactive elements must be included in open spaces with high densities surrounding the park. Landscaping is critical for incorporating activities into open space design.
- The locality of parks must be centred in residential areas and consist of various uses for different age groups.
- The use of parks is increased when:
    - They are clean and regularly maintained;
    - Vehicles are restricted from assessing parks;
    - Indigenous vegetation is protected, and alien vegetation is frequently cleared.
- Increased planting of vegetation in open spaces and green landscaping. Planting of fruit trees and food gardens to be encouraged. Community organisations are to be approached in this regard.
- Areas for pedestrians to include:
    - Increased accessibility and appearance;
    - Parking to be restricted to the backside of buildings to increase public activity in streets;
    - Buffers to be considered between open spaces and residential areas;
    - Emphasise green architecture, planning and design.
- Increase effective conservation of natural areas by:
    - Reducing pollution and littering;
    - Incorporate retention ponds to capture sediment and harmful elements.
    - Managing pedestrian movement to reduce erosion

- Wildlife corridors must be restored and conserved to achieve biodiversity, connectivity and functionality. Create sustainable green spaces for recreational, educational and conservation purposes.

With both the objectives and recommendations in mind, the GOSS sets out proposed projects and tasks to achieve an Open Space System. Including the proposed strategic planning in the IDP will assist in securing funding for open space development and management. An integrated management plan will be required to illustrate a common vision for the use and management of open spaces (GOSS 2008:46). Use of a Geographic Information System (GIS) to document existing open spaces and identify the location for proposed open spaces (GOSS 2008:46). Increase linkages between residential areas, the CBD, river corridors, the Outeniqua mountains and the coast. Identify possibilities to generate income from open spaces that will support the viability thereof and communities (GOSS 2008:48). Lastly, the proposed projects seek to rehabilitate natural areas from previous disturbance, clearing of alien vegetation and increase planting of trees.

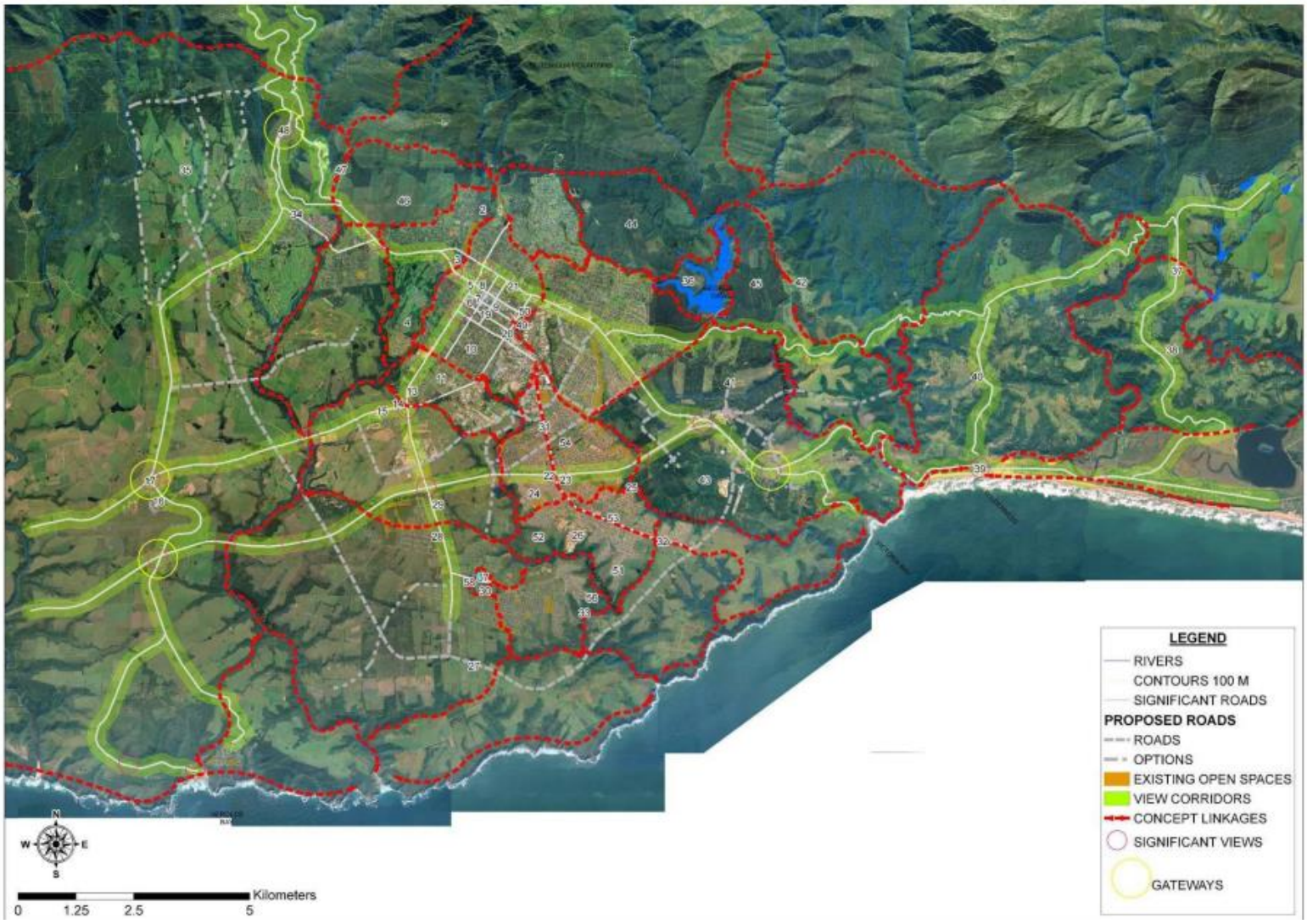


Figure 7-11: Open Space Objective Map

Source: George Open Space System, 2008 (Draft)

7.2 Conclusion

As required by SPLUMA and the Municipal System Act, a variety of SDFs are available to guide development from a national to a local level. Development strategies from a national to a local level promote densified urban areas and efficient transport systems. These factors indicate a clear relationship that was apparent in the literature review above. The provision of different modes of transport seeks to reduce the possibility of -congestion in urban areas, while densification aims to improve transport efficiency. A clear need for natural and open spaces was identified in the different spheres of government.

CHAPTER 8 STUDY AREA: GEORGE

8.1 Introduction

The city of George was first established in 1811 due to the availability of good water in the area. The city is situated between the Outeniqua Mountains towards the North and the Indian Ocean towards the South. George is the second largest city in the Western Cape Province after Cape Town. Known for its tourism and unique character, George also functions as a commercial hub for the Garden Route District. The George City area is situated within the George Municipality that covers 5191km², stretching from the Klein Karoo to the Garden Route coastline. A vast diversity of landscapes is located within the Municipal area including forests, mountains, oceans, rivers and estuaries (Draft GMSDF 2022:14). The largest asset of the George Municipal area is the exquisite calm of the natural environment (LSDF South-East, 2015:47). “a unique sense of place as a result of the visual interconnectedness of the ocean, the scenic undulations due to the steep sided indigenous forest covered river valleys, prominence of open, agricultural spaces as well as the Outeniqua Mountains” (LSDF South-East, 2015:47).The natural landscape plays a role in the “Garden Route” sense of place and should be protected against development and urban sprawl.

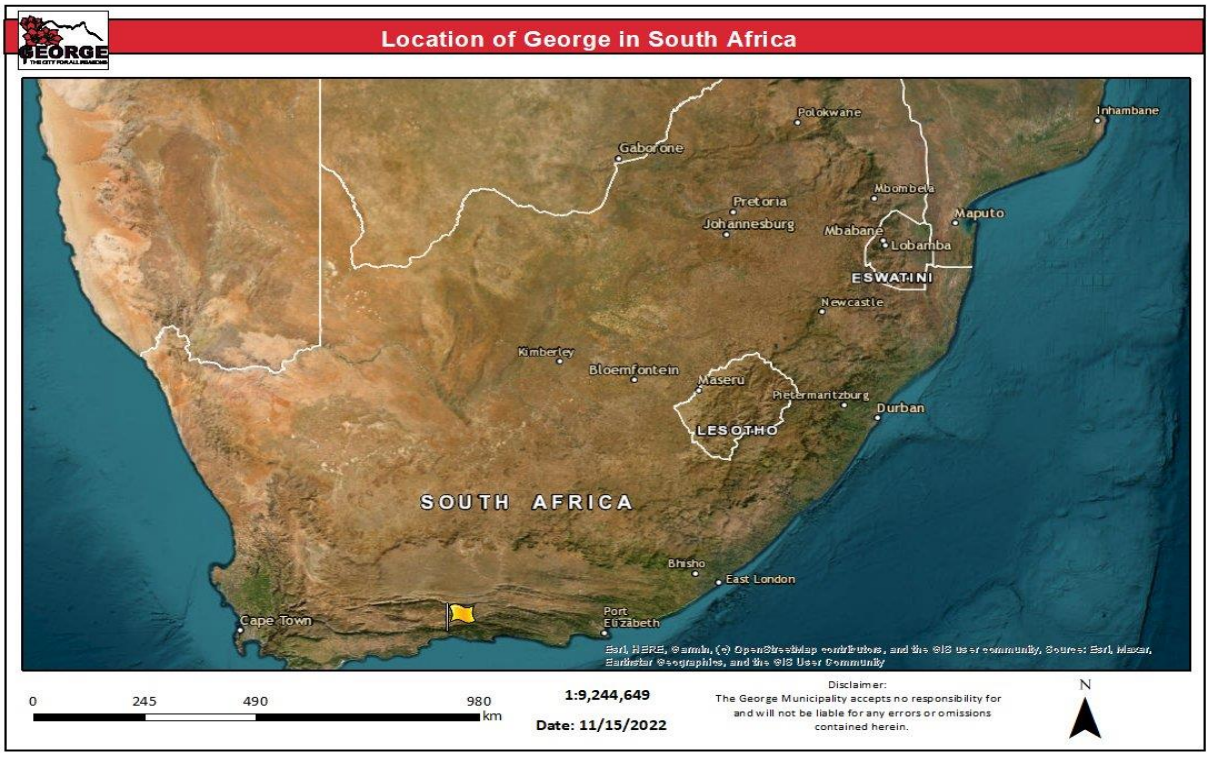


Figure 8-1: Locality of George in national context

Source: Own Compilation

Figure 8-1 above provides a national map of where George is in South Africa. A yellow flag indicates George for ease of reference.

Regarding connectivity, three national routes, namely the N2, N9 and N12, either pass through or end in George, making the city highly accessible via vehicle transportation. Together with the George Airport, which provides regional access to the surrounding area and towns, a diversity of transport modes is evident in the area. George further includes a public transport system known as the Go George bus service, which increases access in and partially around the George city area.

Figure 8-2 below illustrates the George Municipal area. From the figure, the extent of the George Municipal area is larger than the George City area indicated in Figure 8-3. However, approximately 84% of the entire population of the George Municipality resides in the city area. This statistic strongly emphasises the importance of providing functional urban areas with access to open spaces.

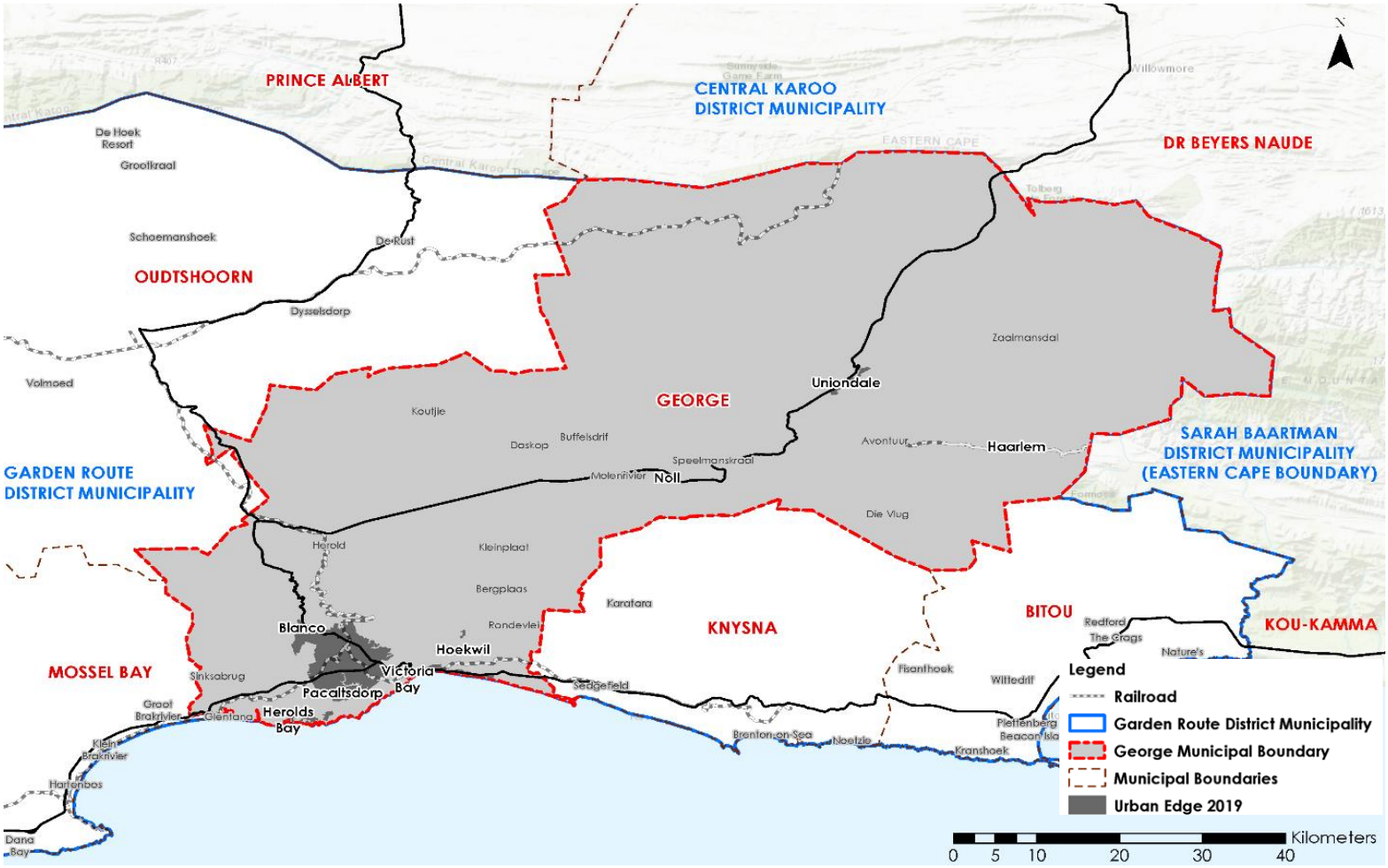


Figure 8-2: George Municipal Boundary

Soucre: Draft GMSDF 2022:16

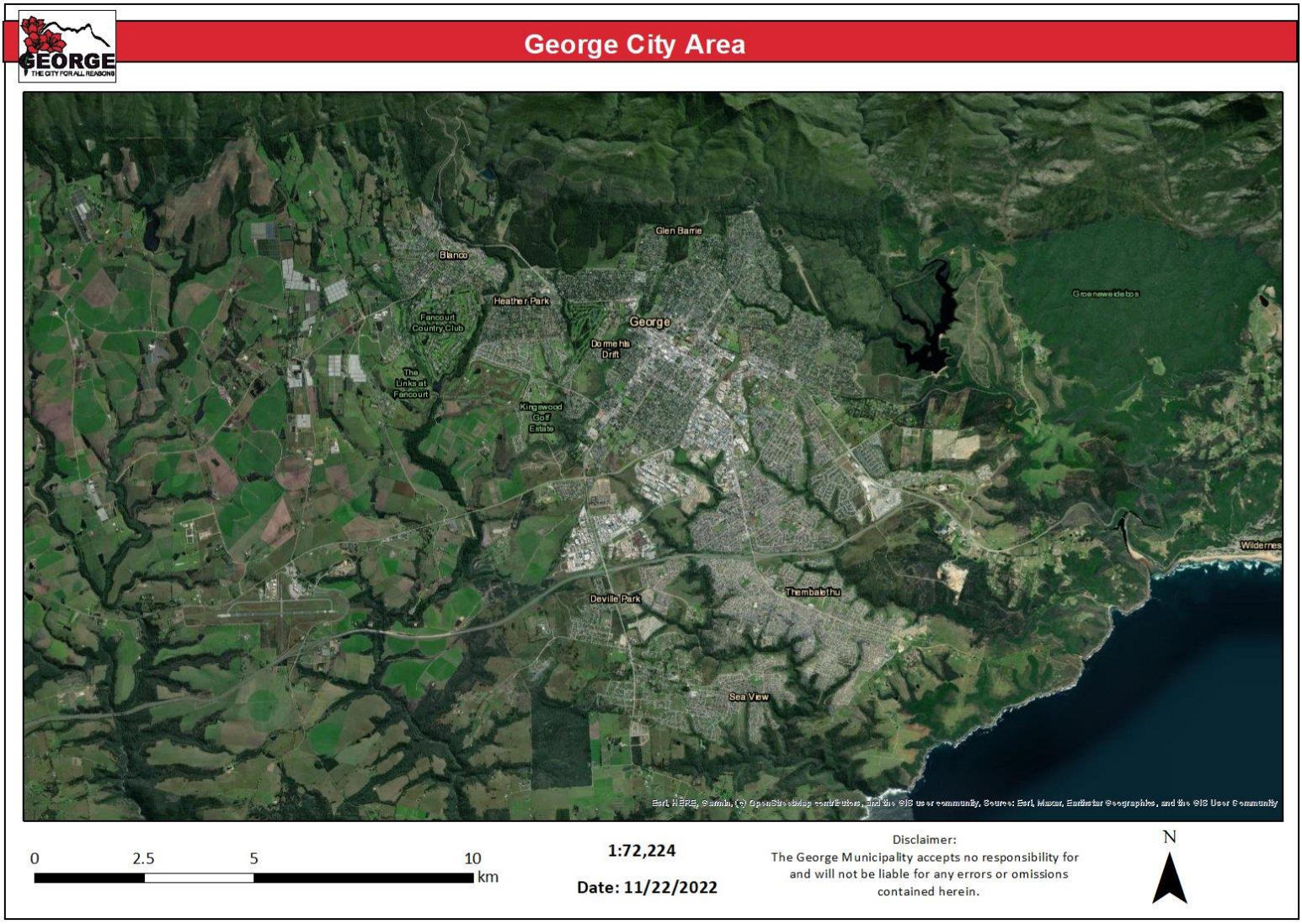


Figure 8-3: George City Area

Soucre: George GIS Viewer, Own Compilation

As the focus of this study is in the George city area, the following map is focused on the proposed study area in the chapter below. It excludes suburbs such as Pacaltsdorp, Thembalethu and Blanco. Figure 8-4 below is a map extract indicating the George city area's open spaces and river corridors. Three larger open spaces exist in the George city area: the Glenwood Golf Course/Riding club, George Botanical Gardens and the Rooirivier Rif recreational grounds. For this study, other open spaces, including the Kat Rivier, Garden Route Dam, George Golf Course and river corridors, will not be evaluated. These areas are located on the outskirts of the urban area and do not form part of the development strategies.

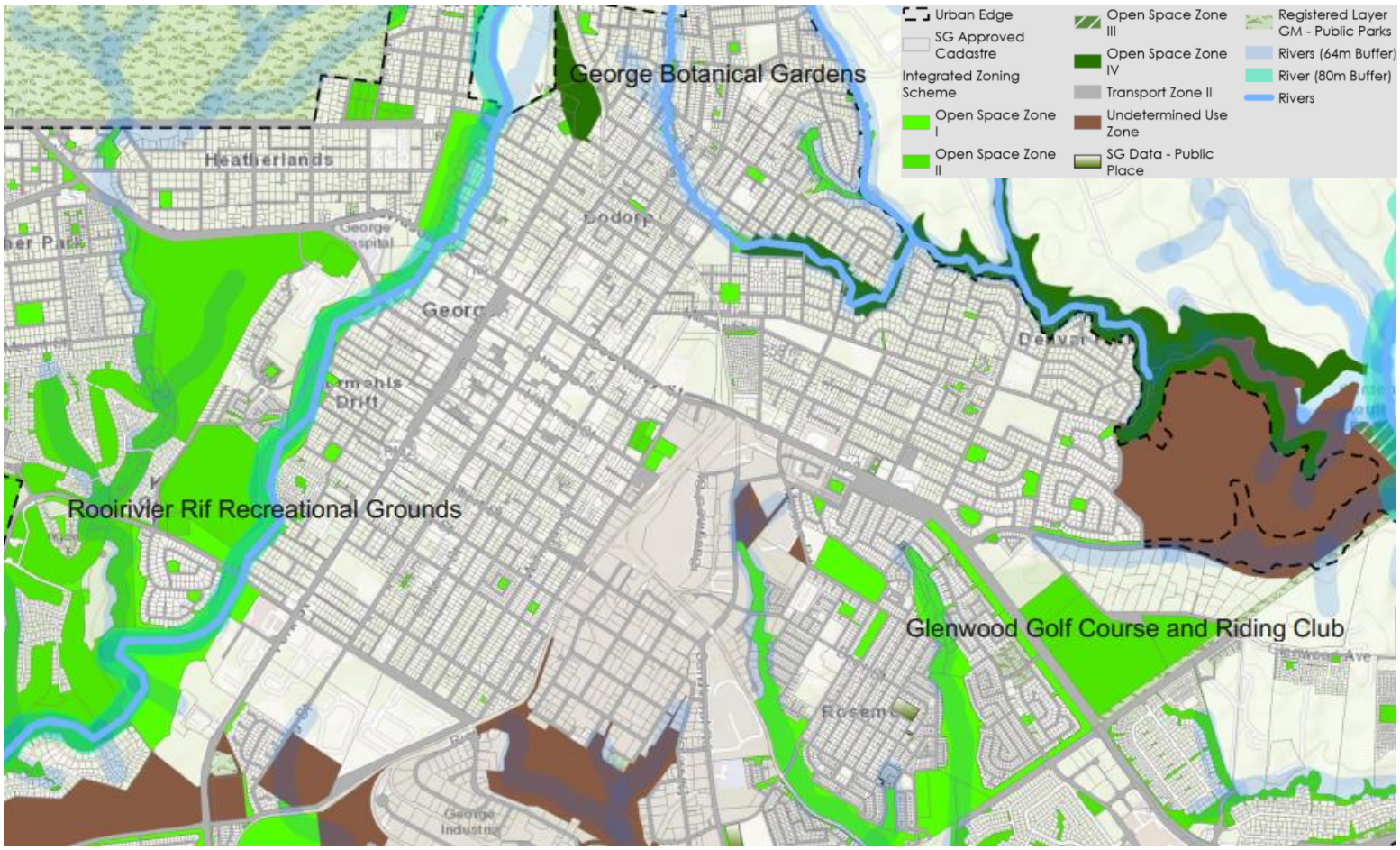
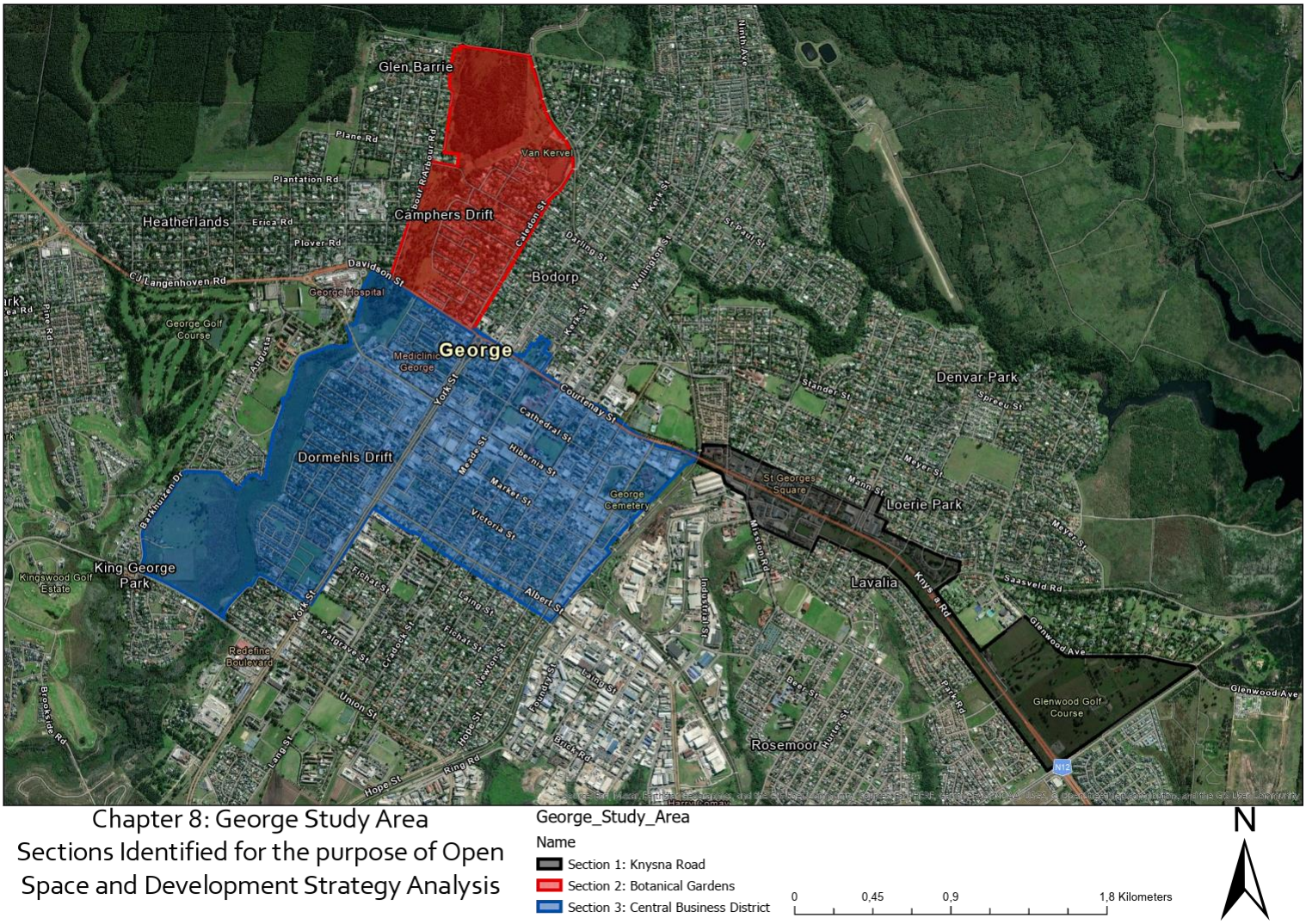


Figure 8-4: Open Spaces in George City Area

Source: George Municipality GIS Maps, May 2022

8.2 Study Area

For this study, sections included in the George city area have been demarcated in Figure 8-5 below. Related to the LSDFs evaluated in the above chapter, the sections of George South-East have been included with the George Central Business District and a portion of the Camphers Drift residential area. A total of three sections have been identified to evaluate current development strategies and the provision of open space. Each section includes unique characteristics that will be examined for site-specific features. Development strategies included in the George Municipal Spatial Development Framework are described, as is their effect on the specific study area. Open spaces to be evaluated include parks, natural corridors and public spaces. The different sections will also include the current zoning of surrounding land uses to provide an overview of the current urban fabric.



Chapter 8: George Study Area
Sections Identified for the purpose of Open Space and Development Strategy Analysis

Figure 8-5: George Municipal Boundary

Source: Own Compilation

8.2.1 Section 1: Knysna Road

Section 1 of the study area is located in the George South-East urban area along Knysna Road. The area was selected due to the availability of a large section of park and a mixture of business, commercial, and residential opportunities. The park area along Knysna Road provides a green space between Glenwood Golf Course and the CBD towards the west, acting as a natural link. Green zoning indicates the green strip and Glenwood Golf Course in the map below. Take note that a portion of the Riding Club is hatched red. Towards the west of Section 1, increased commercial activities are evident, including businesses, light industries and community facilities. Commercial activities are indicated in blue on the zoning map. An increase in residential density is apparent further along Knysna Road towards the west, including flats and group housing opportunities. These residential opportunities are indicated in orange on the zoning map.

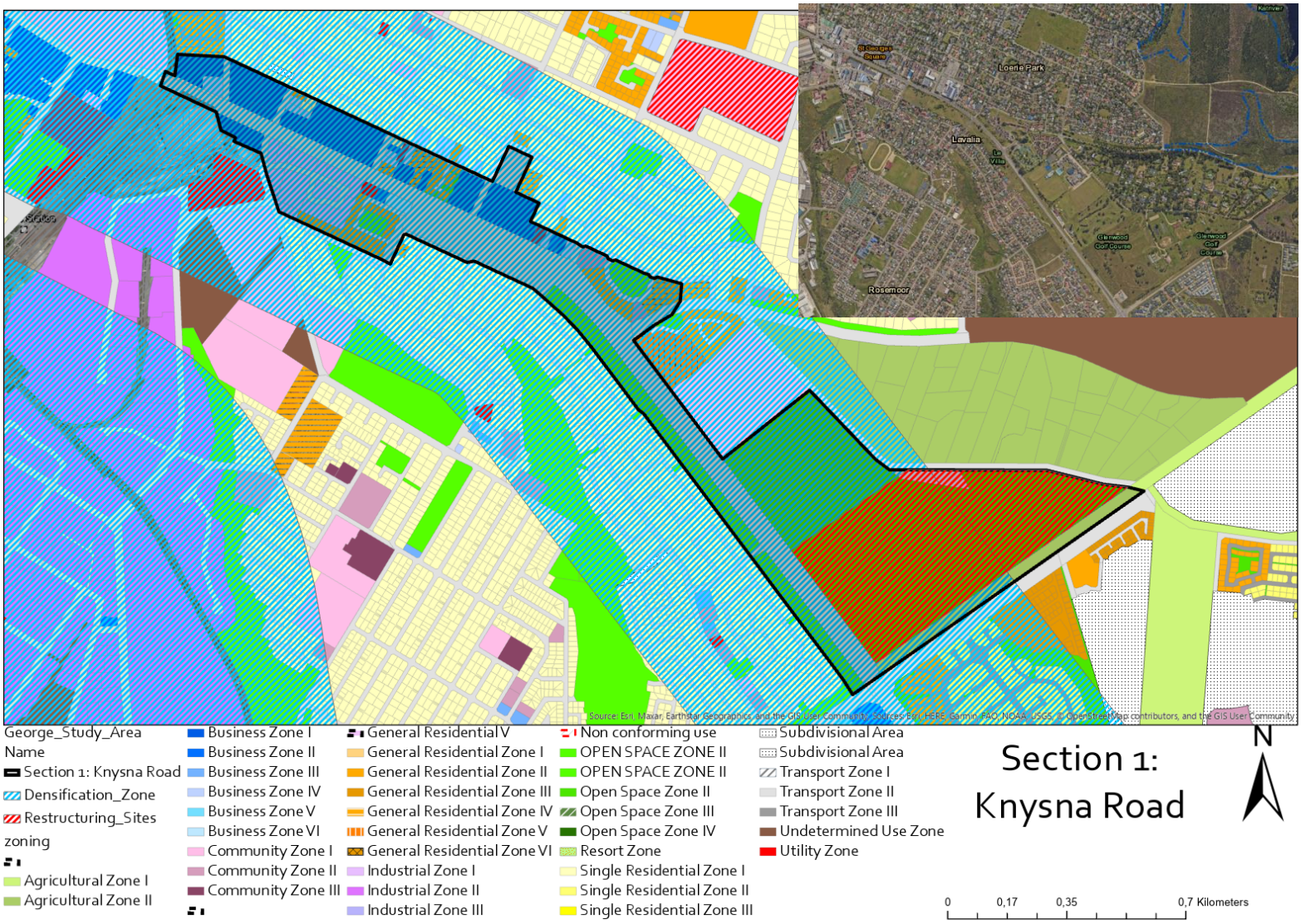


Figure 8-6: Section 1: Knysna Road

Source: Own Compilation

8.2.1.1 Development Strategies

As Knysna Road is identified as an Activity Corridor, it is subject to the 500m catchment zone for intensification (indicated as Densification Zone on Section maps). This zone acts as a buffer on both sides of Knysna Road and promotes increased densities and commercial activities. Increased densities may be promoted along the activity corridor due to high access to different modes of transportation. These modes of transportation include the Go George Bus service, private vehicles and pedestrian walkways. Knysna Road is further identified for the Proposed Integrated Open Space/ Non-Motorised Network indicated in Figure 7-5 above. Although this development strategy is only conceptual, it emphasises the importance of access to open space to increase walkability. Lastly, the Glenwood Gold Course and Riding club have been demarcated as a Priority Restructuring Infill Site. These sites are demarcated for subsidised housing focussed on increasing residential densities and providing housing opportunities for residents in a lower income bracket. According to the GMSDF of 2019, the restructuring sites may also be suitable for mixed-use development, including business and commercial activities.

8.2.2 Open Space Evaluation

Currently, the Glenwood Golf Course area provides recreational features for surrounding residents, for example, horse riding tracks, a golf course and a driving range. The green strip on the southern side of Knysna Road contains mainly ecological functions with little social or economic functionality. Various plant and tree species can be found in this green strip, including several endangered Yellow Wood trees. At the western most portion of the green strip, a play area has been provided for residents with some new outdoor gym equipment. However, due to lack of maintenance and vandalism, the play area is severely degraded therefore having almost no recreational functionality. Based on observations during a site visit, it is apparent that no park furniture has been provided, such as benches, tables, or rubbish bins.

Further, a lack of lighting makes this space unsafe during the evening and reduces the use thereof after sunset. For walkability, there is a paved walkway from the western boundary of Section 1 to the last bus stop, approximately in the middle of the green strip. From this point further east, no formal walkway has been provided, and only informal footpaths can be found in the green strip leading from the road to the residential land uses.

8.2.3 Section 1 summary

Section 1 strongly emphasises commercial development; however, the functionality of the current open spaces is undermined. Public transport and pedestrian walkways contained in Section 1 increases accessibility for surrounding residents.

8.3 Section 2: Botanical Gardens

Section 2 of the study area is located in the residential suburbs known as Bodrop and Camphers Drift. This section was selected due to the George Botanical Gardens and Van Riebeeck Gardens, which are indicated by two shades of green in the zoning map below. The primary access road for this section is Caledon Street linking Courtney Street to the south with the Botanical Gardens to the north. Caledon Street is located on the eastern boundary of Section 2 below and is also identified as a Go George Bus route promoting access to public transport for surrounding residents.

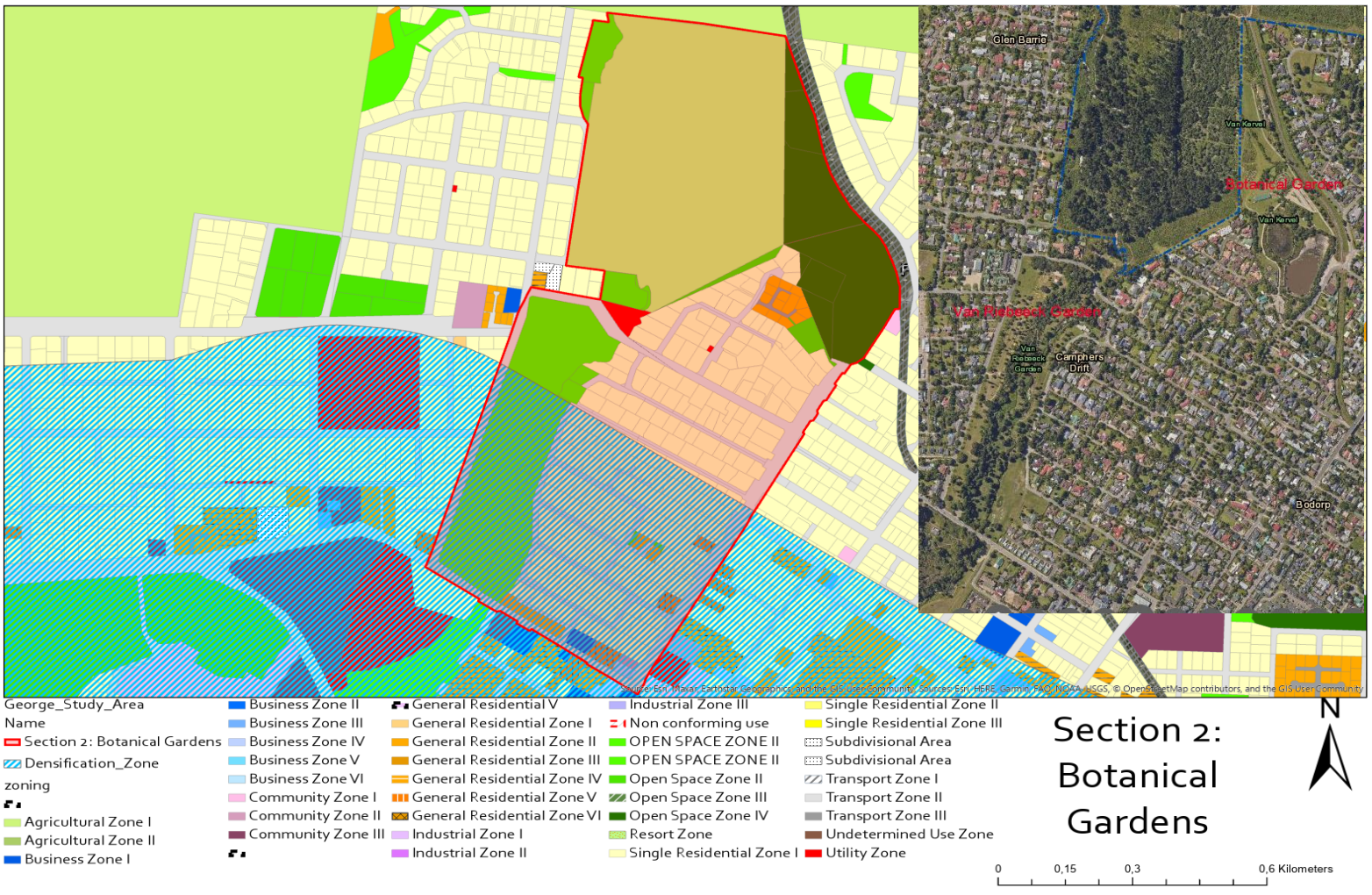


Figure 8-7: Section 2: Botanical Gardens

Soucre: Own Compilation

8.3.1 Development Strategies

The delineated Section 2 has restricted development strategies that apply to the area. The lower portion of Caledon Street is included in the 500m catchment zone for intensification (Densification Zone), promoting an increase in residential and commercial activities. Limited higher residential land uses can be seen along Caledon- and Courtney Street. The green corridor that links a portion of the CBD with the Outeniqua Mountains is also indicated as a Proposed Integrated Open Space/ Non-Motorised Network. Further, the Botanical Gardens are demarcated as a protected area for local conservation, restricting urban development.

8.3.2 Open Space Evaluation

Firstly Section 2 of the study area contains the George Botanical Gardens, known for its biodiversity and recreational functionality. The gardens contain different flora species, from small plants to shrubs and large mature trees. The botanical gardens provide access to the Outeniqua mountains towards the north via natural walkways. Economic functions in the botanical garden include a plant nursery and a coffee shop. This contributes to the multifunctional use of the open space for residents and visitors. Several areas in the botanical gardens have park furniture, such as benches and bins for residents and visitors.

Further contained in Section 2 is the Van Riebeeck Garden, located along the Camphers Drift River corridor leading to the CBD towards the south. This open space has a robust ecological function for the movement of fauna and flora from the mountains towards the south of George. This open space promotes social interaction through walkways, park furniture, play areas and new outdoor gym equipment. Economic functionality is promoted in the Van Riebeeck gardens as it contains a coffee shop with several tables for residents to enjoy. The Botanical- and Van Riebeeck Gardens are pristine examples of multifunctional open spaces as they contain ecological, social and economic functionality. These functions further build on the sustainability of the open spaces.

Lastly, Caledon Street acts as a boulevard and green link from the botanical gardens into the George CBD. The street is characterised by residential land uses that are set back from the road to provide efficient space for pedestrian movement. Broad sidewalks are provided on both sides of the street, with mature trees located along the sidewalks.

8.3.3 Section 2 summary

From the above, it is evident that open spaces contained in Section 2 of the study area promote efficient multifunctional open spaces. Development strategies in this section, however limited, are applicable to the specific area's unique character and setting.

8.4 Section 3: Central Business District

Section 3 of the study area is the George CBD and is located at the centre of the urban area. The CBD of George contains multiple features and land uses, providing a vibrant urban area. A concentration of businesses is evident towards the north of the CBD and along primary roads. These primary roads include York Street and Courtney Street, which enter Knysna Road towards the east. The CBD contains several community facilities such as schools, institutions and governmental land uses. A mixture of residential opportunities is evident in the CBD, including several housing typologies and flats.

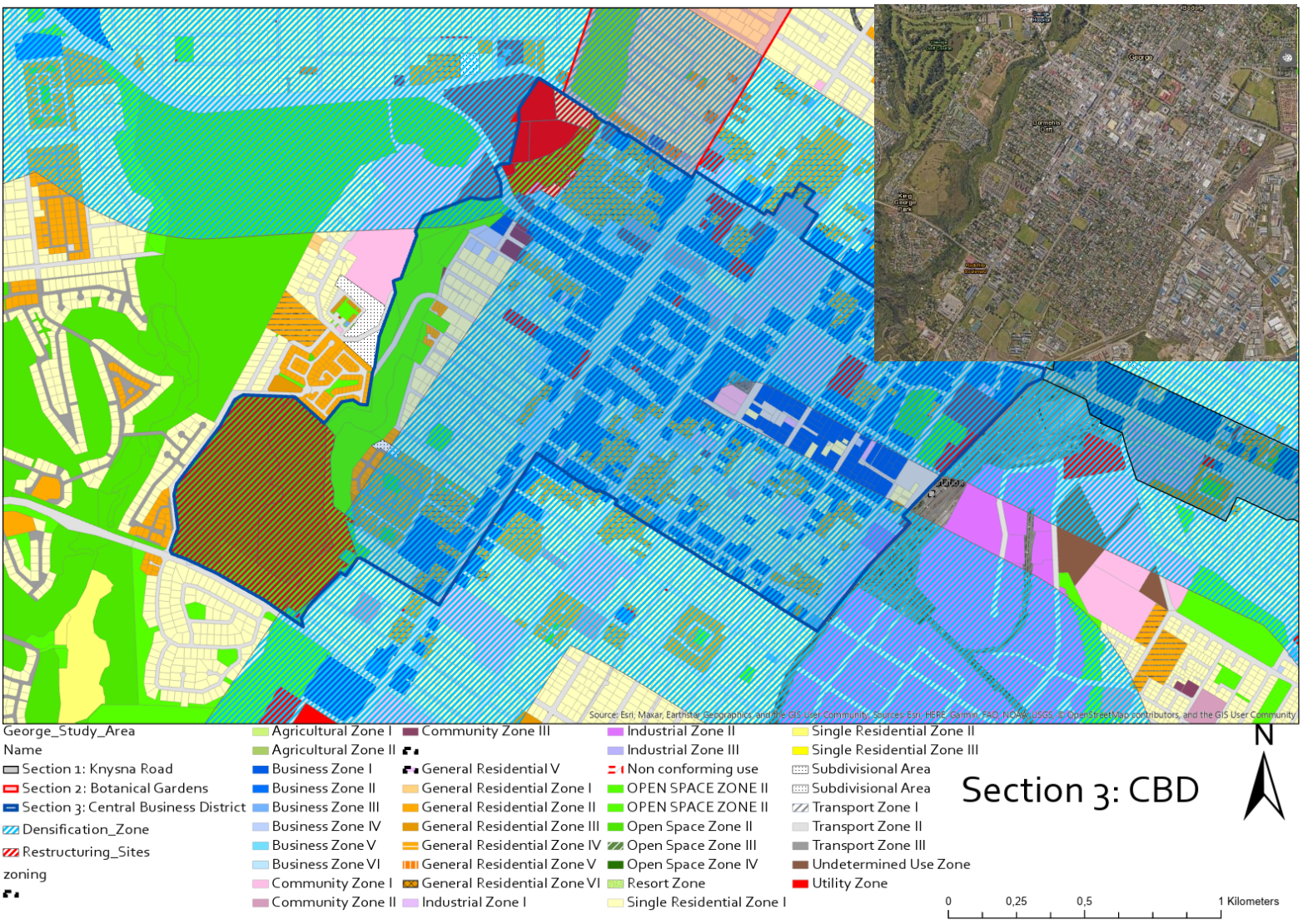


Figure 8-8: Section 3: Central Business District

Source: Own Compilation

8.4.1 Development Strategies

The CBD of George contains several development strategies focussed on the increased efficiency of the urban system. Only the development strategies mentioned in the legislation section of the paper will be discussed in the study. The first is the Densification zone included in Sections one and two above. This zone is also referred to as the 500m catchment zone for intensification, promoting increased residential densities and mixed land uses. Further, several sites in the CBD have been demarcated as restricted sites for social housing development. As previously mentioned, these sites specially promote increased densities and provide housing opportunities for residents in a lower income bracket. According to the MSDF Map Figure 7-5, the primary roads in the CBD have been indicated as Proposed Integrated Open Space/ Non-

Motorised Network. Sections one and two contain the above-mentioned development strategies unique to the CBD, the Medium-Term Business- and High-Density Residential Development Edges indicated in the map below. In chapter 7.1.4.1 above the Medium-Term Business- and high-Density Residential Development Edges are extensively discussed. In summary these edges are implemented to restrict the development of businesses and high-density residential land uses within the edges. These edges seek to protect the surrounding single residential land uses from intensive development.

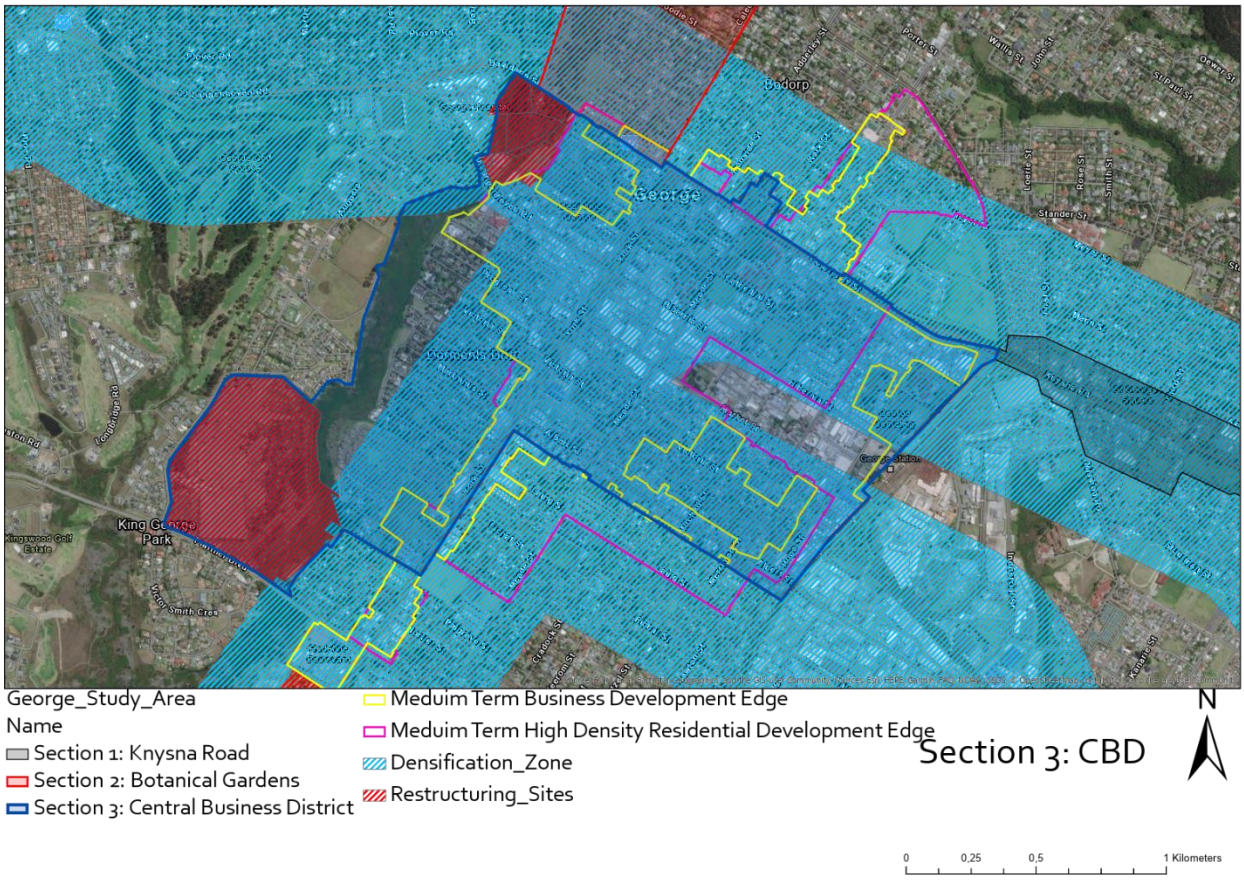


Figure 8-9: Section 3: Central Business District Development Strategies

Source: Own Compilation

8.4.2 Open Space Evaluation

From the investigation, it is evident that the provision of open spaces in the CBD area is undermined and lacking. The above zoning map indicates open spaces being provided on the eastern side of the CBD; however, this green portion is merely a cemetery and does not contain sufficient recreational activities. Aerial photos indicate several grassed areas that could be incorrectly interpreted as open spaces within the CBD. However, these grassed areas are local sports fields for several schools in the CBD of George. Smaller portions of open space are

provided at churches, municipal buildings and the York Street circle, as indicated in aerial photos below. These open spaces include different vegetation species contributing to the ecological functionality of the CBD as a whole. Further, these spaces provide park furniture, including benches, seating areas and rubbish bins.

Figure 8-10: Open Space portions in CBD
Source: George GIS Viewer, 2022

A noteworthy open space in the CBD area of George is the Camphers Drift River corridor leading from the Van Riebeeck Gardens in Section 2 of this study towards the south. The river corridor links the Outeniqua mountains with the coast and is protected against urban development. On the western side of the river corridor is the Rooirivier Recreational grounds, indicated as red-hatched green zoning. The recreational grounds include a cricket pitch, a mashy golf course and newly constructed tennis courts. Together with a cricket clubhouse providing meals and beverages, the recreational grounds include an economic function. The red hatch covering the recreational grounds illustrates that the area has been demarcated as a Restructuring Site. However, during recent discussions with Municipal Officials, the restructuring site proposal could be revoked to preserve the site for recreational activities.

8.5 Conclusion

From the above, it is evident that George consists of different urban areas with unique characteristics. Planning and development strategies should be implemented according to unique characteristics. To sufficiently incorporate open spaces into these areas, the unique characteristics should be considered, and implementation may prove complicated. Section 2 of the study area includes the most sufficient provision of open spaces while development strategies

are limited. Primarily the character of this area is being preserved by restricting development that may negatively impact natural features. Sections 1 and 3 of the study area contain the most prominent development strategies. However, the incorporation of open spaces in these strategies is limited. Several development strategies include open space provision; however, implementation is lacking.

CHAPTER 9 FINDINGS OF EMPIRICAL RESEARCH

9.1 Introduction

The following section provides the findings from the empirical research conducted. It examines the case studies included in Chapter 6 above, together with a table evaluating the open spaces in each case study. Further, this chapter will summarise the different legislative documents assessed in Chapter 7 and provide brief findings on the overlapping policies. A possible correlation between different legislative documents is identified in the findings section

9.2 Case studies

Different trends have been identified in the case studies evaluated in the empirical study. Table one below compares the trends found in these case studies. A correlation is evident between the distances travelled and the mode of transport used. Residents that frequently use open spaces live close to the open spaces and would walk to the open spaces. However, people that only had access to specific parks were more willing to travel further distances using motorised transport. The subsequent correlation was made between the number of functions available and the frequency of open space use. Residents were more attracted to open spaces that consist of multiple functions. The need for social interaction, exposure to natural environments and cultural significance increased the frequency of usage. The last finding to be drawn from the case studies is the impact that push (negative) factors have on residents' perceptions and frequency of use. Certain push factors are repeated in each case study resulting in reduced frequency of use. Push factors observed included the distance travelled to reach open spaces. As distances increase, the accessibility of open spaces is reduced, and residents report a negative experience with the provision of open spaces.

With the findings drawn from the case studies, these factors could apply to George's study area.

Table 9-1 below compares the three case studies included in the empirical research.

Table 9-1: Case Study Comparison

Urban Areas	Distance Travelled	Mode of Transport in terms of distance	Functions Available	Push Factors
Santa Cruz	100m 500m 1000m 10km	Foot up to 500m Bicycle up to 1000m Motorised Transport up to 10km	Socio-Cultural Environmental	Over Development Size Distance Unsafe Poor Maintenance
Kalad	250m 1000m	Foot up to 1000m Bicycle up to 1000m Motorised Transport 1000m and more	Socio-Cultural Environmental	Distance Location Design Poor Community services Weather Conditions
Copenhagen	300m 500m 1000m	Foot up to 500m Bicycle up to 1000m Motorised Transport 1000m and more	Socio-Cultural Economic Environmental	Policy Implications Distance

Source: Own Compilation

Table 9-1 represents a summary of the case studies evaluated. In these case studies, certain factors were repeated. The distance travelled by residents, the mode of transport they used to travel to the open space, the functions available at the open space and the factors that

discouraged residents from visiting the open space. However, the main factors discouraging visits to open spaces were distance and functions.

9.3 Legislation

During the empirical research, several planning documents were assessed to identify possible development strategies related to urban areas. The focus was placed on strategies that include open space development and the preservation of natural areas for ecological functionality.

The overarching National Development Plan provided the primary principles for development focussed on sustainability. Sustainability seeks to achieve the current social and economic requirements while reducing the adverse effects on the environment. The desired outcome is a future for South Africa that promotes vibrant communities with access to services, job opportunities and housing. The development strategy most stressed is promoting densification to reduce the costs of providing services and degrading the environmental performance. The principles highlighted in the NDP applicable to the study are achieving environmental sustainability, providing public transport systems and regenerating urban areas. This includes integrating compact urban zones to be implemented by municipalities on the local planning level. It supports the development of mixed-use zones to strengthen economic and social inclusion in all urban areas.

The Spatial Planning and Land Use Management Act requires the development of Spatial Development Frameworks at different planning levels. The National SDF is the highest level of SDF and lays down the principles for transformation and integration in South Africa. The NSDF builds on the sustainable development strategy by referring to increased densification and diversification of urban areas. These strategies seek to increase resilience and integrated urban functions. Mixed-use development is a guiding principle for development strategies that create quality public places for communities. Protecting, using and managing the natural systems on regional and urban levels is strongly accentuated. Urban development should not compromise natural areas or their ecological functionality.

Following the NSDF in more detail, the Provincial Spatial Development Framework is examined based on different provinces' development. In this study, the Western Cape PSDF was evaluated as the study area is located in this province. Three themes were included in the PSDF focused on (i) sustainability, (ii) providing opportunities and (iii) integrating communities. Two development recommendations included in the PSDF were densification and mixed-use development. The consequences of inadequate compaction of urban areas in the Western Cape could negatively impact communities, the economy and environmental functionality. Specific policies included

containing urban sprawl, promoting infill development and incorporating open spaces. Protecting valued resources and landscapes was emphasized in George.

A Regional Spatial Framework applies to the Garden Route/ Southern Cape district to give effect to the principles of the PSDF. Once more, the primary emphasis is promoting sustainable development by integrating management strategies. The Regional Framework sets out Regional Values for development strategies, one of which is people-centred development. These values promote the principles set out by SPLUMA for spatial justice, efficiency, resilience and sustainability. The people-centred regional value highlights densification, urban compaction and mixed-use development. The Regional Framework states that open spaces in urban areas are poorly developed and managed, resulting in inadequate access to environmental resources.

On the local level, the George Municipal Spatial Development Framework provides guidance and principles for the development of the George Municipality. The MSDF is a requirement of the George IDP that illustrates the desired spatial form of the municipality. In particular, the MSDF indicates the desired utilisation of land and the environmental impact of strategic objectives. Several development strategies in the MSDF relate to policies and guidelines of National, Provincial and Regional development frameworks. Spatial efficiency is promoted by policy guidelines focused on urban densification. Mixed land-use development strives to achieve economic viability and social integration for all residents. The efficiency of mixed land use is measured by affordable housing, access to required services and walkability. Access to public transport within the George City Area is a primary development strategy. Policies included in the MSDF promote open space development and the conservation of natural areas. Policy A4 of the MSDF focuses on developing high-quality, safe open spaces. Existing open spaces should be maintained and protected against development and transformation. Development strategies may actively seek to increase linkages between open spaces and promote non-motorised transportation modes.

On a more detailed level, local spatial development frameworks applicable to the defined study area were assessed. The CBD and George South-East LSDFs focused on urban densification and increasing land use. Mixed-use development was promoted in urban areas to increase access to required services and facilities. The CBD LSDF further demarcated sectors with area-specific development strategies applicable to opportunities and constraints. The establishment of an open space system was included in the CBD LSDF as a priority for the urban area. The open space system would contribute to sustainable development and enhance community benefits for all residents.

The Pedestrian Network Urban Design Framework Recommendations are built on the policies contained in the CBD LSDF. Specific guidelines and recommendations were provided applicable to precincts identified in Figure 7-8 above. The primary principles of the Pedestrian Network are increasing functionality, providing linkages, ensuring safety and protecting the area's character.

The Draft George Open Space Policy contains strategies and guidelines on how the natural open space system in the urban area of George should be managed, maintained and planned. The document aims to develop George as a garden city, including open spaces that are multifunctional safe and integrated into the urban fabric. A nature-orientated sense of place is promoted for communities protecting the ecological functionality of the urban area. One of the key guidelines suggested by the open space policy is providing open spaces in densification areas. Together with providing open spaces, these spaces should be managed, and an economic function should be incorporated.

Based on the above summary of different legislation, levels of SDF, guidelines and policies, the following is apparent:

- Densification of urban areas is promoted at all levels of legislation. Densification seeks to increase land uses within the urban context, specifically providing mixed land uses. To ensure that increased land uses are sustainable within urban areas, the number of residential opportunities should be sufficient. Only by promoting densification can communities use services and facilities more effectively.

- The provision of different modes of transport is a significant contributor to the efficient implementation of densification strategies. Access to public transport and increased walkability will increase the accessibility of urban areas.

- Several open space guidelines and policies are included in legalisation; however, a need for efficient planning and management is evident on all legislation levels. An absence of criteria for providing open space restricts how and where open spaces are developed. Guidelines on managing open spaces to improve their role in urban areas progressively are deficient.

- Land uses that could complement open space functionality are not noticeable in the different legislation levels.

- The social, environmental, economic and cultural benefits of providing open spaces are not indicated. Merely indicating that open spaces should contain economic benefits will not provide possible intervention methods.

- Input from communities regarding their detailed needs is restricted and undermined. Although the development guidelines for different legislation levels undergo a public participation process, several detailed needs are not addressed.

- The financial cost of infrastructure, services and overall maintenance could be reduced by ensuring densification is correctly implemented.

9.4 Conclusion

The above findings are directly related to the factors observed in the case studies. Different cities in different countries experience the same push factors that result in the less frequent use and enjoyment of open spaces. Legislation shortcomings were identified specifically relating to open space development and management. These shortcomings may result from inefficient open space provision on different levels of government.

CHAPTER 10 SYNTHESIS AND RECOMMENDATIONS

10.1 Introduction

The recommendations made in this part of the report are based on the factors identified in the literature review. The relevant factors identified in the case studies were used to provide recommendations. Study recommendations were created by combining lessons learned from case studies with the factors found in the literature. These recommendations included improving factors such as multifunctionality, management, planning criteria and overall design of open spaces. These factors contributed to understanding the role of open spaces within urban morphology. Applicable policies found in the case studies also form part of recommendations as the policies help increase the functionality of open spaces in cities.

10.2 Synthesis

The literature review conducted an in-depth review of the different factors contained in urban form that contribute to the understanding of urban morphology. Furthermore, the development strategies that influence urban form were assessed to increase the understanding of urban areas. As this study's primary focus, factors applicable to open spaces in urban areas were examined to provide background and context for possible recommendations. These factors included the functions of open spaces and how open spaces are planned and managed. It is evident that when identified factors are neglected, open spaces may become unfunctional and the use thereof reduced. This statement is supported by the case studies evaluated as part of the empirical study. In these case studies, factors were determined that influence residents' perceptions of open space. Negative factors are linked to planning and management principles that were neglected when designing open spaces. These factors contribute to the push factors identified in the case studies. The need for increased functions in open spaces can also be linked to neglected planning and management guidelines.

In terms of the study area, negative factors are evident in the open spaces in the George city area and result in less frequent use. A lack of open spaces in the George CBD results in residents requiring social interaction and recreational areas. The CBD, the most populated area in George, emphasises the community's need for open spaces. Thus, for visits to open spaces, residents must travel further distances, which decreases their use of open space. Another factor influencing open spaces in the study area is how the open spaces are spatially distributed. The open spaces on the edges of the CBD are not accessible to some residents in this area. The lack of public facilities in the open spaces also contributes to how residents perceive these open spaces and

could decrease their frequency of use. Unsafe areas in the green strip along Knysna Road reduce residents' peace of mind, resulting in less frequent use.

Open spaces evaluated in the George Botanical Gardens Section tend to experience more frequency of use due to the availability of multiple functions. Social interaction is promoted through play areas, footpaths and park furniture. Economic functions tend to increase the purpose of visits, ensuring that residents can enjoy different uses in the same open space. Natural beauty and the availability of ecological functions provide an opportunity for human-nature interaction.

10.3 Realisation of research aims and objectives

The main aim of the research conducted was to investigate how open space planning can be incorporated into development strategies. The literature review and the empirical investigation show that development strategies can incorporate open spaces development. Providing policies that contain the importance of planning and managing open spaces will efficiently lead to incorporation. The benefits of promoting open space development are evident in social, environmental and economic factors. The development strategies evaluated above contain deficiencies that can be addressed by providing open spaces. One main component of urban form is open and natural spaces for urban morphological functionality. This indicates that open space provision is a requirement for urban areas.

Development strategies' objectives include increasing urban areas' sustainability through policies and guidelines. These guidelines include the provision of areas for social interaction and recreational activities. Open spaces could include social functionality that will assist in ensuring the sustainability of development strategies. During the literature review of open spaces, the role and functions were identified. Community needs related to open spaces were further described in the case study evaluation in the empirical investigation. The needs of communities could be addressed by incorporating different functions into open space development. The final objective included in this dissertation was reflecting on the role of different legislative documents guiding development in South Africa. From the empirical investigation, the primary role of legislative documents is to address previous shortcomings and promote sustainability in future development. All legislative documents included development strategies applicable to South Africa with an open space component. Protecting natural areas and open spaces against excessive development is highlighted from the NSDF to the LSDF level.

10.4 Recommendations

The recommendations are based on the literature, applicable legislation and empirical findings. These factors are applied and suggested within the context of the study area within each identified section's unique characteristics. Firstly, the recommendations are based on physical aspects that can help improve residents' perceptions. Secondly, policy proposals are used to increase the development and sustainability of open spaces.

10.4.1 Physical proposals

- Open spaces should not be restricted to grassed areas or parks with limited functions. Increasing the number of open space functions will increase the area's use for different purposes. Providing economic, environmental, cultural, social or aesthetic functions in open spaces will increase the frequency of use.

- Maintenance of open spaces should be conducted frequently to ensure open spaces are clean and safe for everyday use. The safety of the green strip along Knysna Road should be increased by providing efficient lighting, and law enforcement should conduct regular checks. Rubbish bins should be provided to ensure the areas are kept clean.

- The natural aspects of open spaces should be increased in all instances. Increased vegetation, especially trees, contribute to ecological functionality. Maximise ecological benefits through preserving wildlife habitat and river corridors and enhancing biodiversity. Open spaces should be demarcated, and any development that may degrade open space should be restricted.

- Consider urban gardens on adequate land portions to increase local residents' food security. Allow communities to plant, grow and harvest additional crops for economic empowerment.

- Consider local markets on identified open spaces to increase economic functionality and community enablement. This will allow communities to trade local goods and promote social interaction between communities.

Figure 10-1: Community Gardens and Local Market Source: Google Images

- Approach communities on their specific social and recreational needs related to open spaces. Consider regular engagements with ward committees to accommodate evolving community needs.

- The layout of urban areas should be evaluated to consider possible redevelopment of underutilised spaces. Figure 10-2 below shows how parking areas could be redeveloped to incorporate open space for pedestrian movement and increased functionality. The images from Google Street View illustrate the south-eastern and north-eastern corners of the Meade- and Market Street intersection in George.

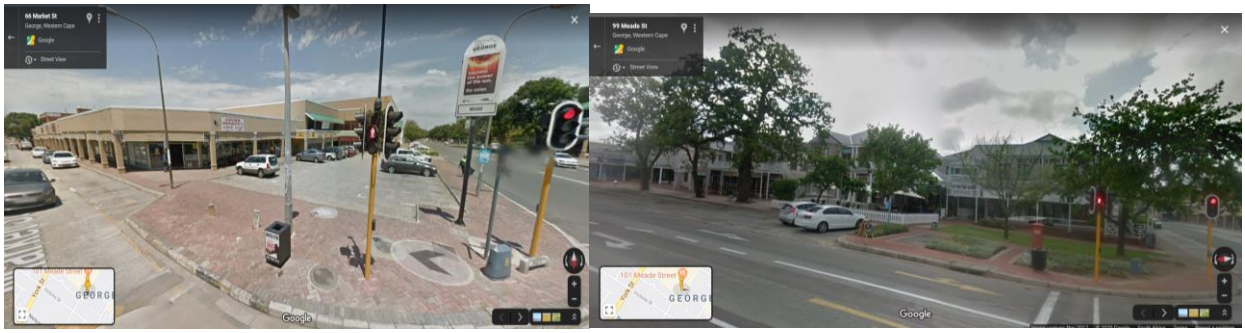


Figure 10-2: Redevelopment of Parking Area

Source: Google Street View, 2022

- Green linkages should be considered along major transport routes to increase connectivity between open spaces and urban nodes. The figure below provides a spatial illustration of possible green linkages between open spaces and the CBD. The green strip along Knysna Road could initiate a proposed linkage between the Glenwood Golf Course and the Rooirivier Rif recreational grounds. The proposed pedestrian network was also included in the figure to build on existing development strategies.

- Integrate building designs and engineering infrastructure with the natural landscape and pedestrian walkways to create unified and visually appealing urban areas. Figure 10-3 below visually illustrates a building design integrated with walkways.

Figure 10-3: Building walkway integration.

Source: Google Images

- Create landscapes that are aesthetically pleasing to increase community enjoyment of open spaces. This may increase the pleasure of everyday life and create a meaningful connection between people and the environment. The sense of place in urban areas could dramatically increase for residents and visitors.

- Incorporate heritage structures and areas of cultural value into the broader open space system. Protect landscapes with recognised special significance and scenic value.

- Promote tourism-related activities in open spaces to increase economic viability and the frequency of use. Tourist-related activities tend to increase investment in the local community, which can be utilised to increase open space multifunctionality.

- Utilise open space to reduce pollution in the urban environment. Retention dams may assist in reducing stormwater runoff and filter pollutants from roads and hardened surfaces. Vegetation can reduce air- and noise pollution generated by urban activities.

- Increase publicly accessible facilities such as ablutions for residents utilizing open spaces and parks.

10.4.2 Legislative and policy proposals

- Functional Open Space should be clearly defined in all legislative documents to avoid confusion and misinterpretation. Defining what is required in functional open spaces could assist in the planning and design of such spaces.

- Include policies within the Spatial Development Framework (SDF) that increase the importance of open spaces. During the review of the Municipal- and Local Spatial Development Frameworks, guidelines and principles related to development strategies should include open space protection and management.

- Consider providing open space size requirements in line with the number of dwelling units in the surrounding area. Should new residential areas be proposed, a fixed size of open space should be a requirement to complement the development.

- Supplementary land use should be listed according to its social, economic of ecological functions in development strategies. This will allow open space development strategies to assess appropriate land uses for different open spaces according to context and community needs. Supplementary land use could be contained within the spatial development framework or the appropriate land use and zoning scheme bylaws.

- The principles for a sustainable urban environment should be promoted in development strategies and open space planning. Providing areas where residents can Work, Play, Relax, Live, and Shop will enhance the sustainability of urban areas.

- Include a requirement for park furniture provision to increase functionality and useability of open spaces. Park furniture could include a seating area, benches, tables, play equipment and art.

- Develop an Open Space development strategy and implementation plan for the George city area to be considered and adopted by Council. This policy should protect existing open spaces and provide means of developing new open spaces.

10.5 Proposed Open Space System

For the purpose of providing a spatial illustration for this dissertation's recommendation section, the following figure illustrates a proposed open space system for George. The existing open spaces and the Camphersdrift River Corridor have been indicated and provide the basis of the proposed system. Green linkages have been proposed to enhance connectivity between these open spaces and different urban areas. Green linkages are proposed along major transport routes, as indicated in the George MSDF. These transport routes include York Street, Nelson Mandela Boulevard, Knysna Road, Hope Street and Courtney Street. The proposed pedestrian network has been included with minor roads to increase connectivity.

The proposed green linkages should incorporate the physical and policy recommendations above to increase functionality. The main focus should be efficient pedestrian movement along the proposed green linkages. The provision of park furniture should be encouraged along proposed green linkages to improve social interaction and community perceptions.

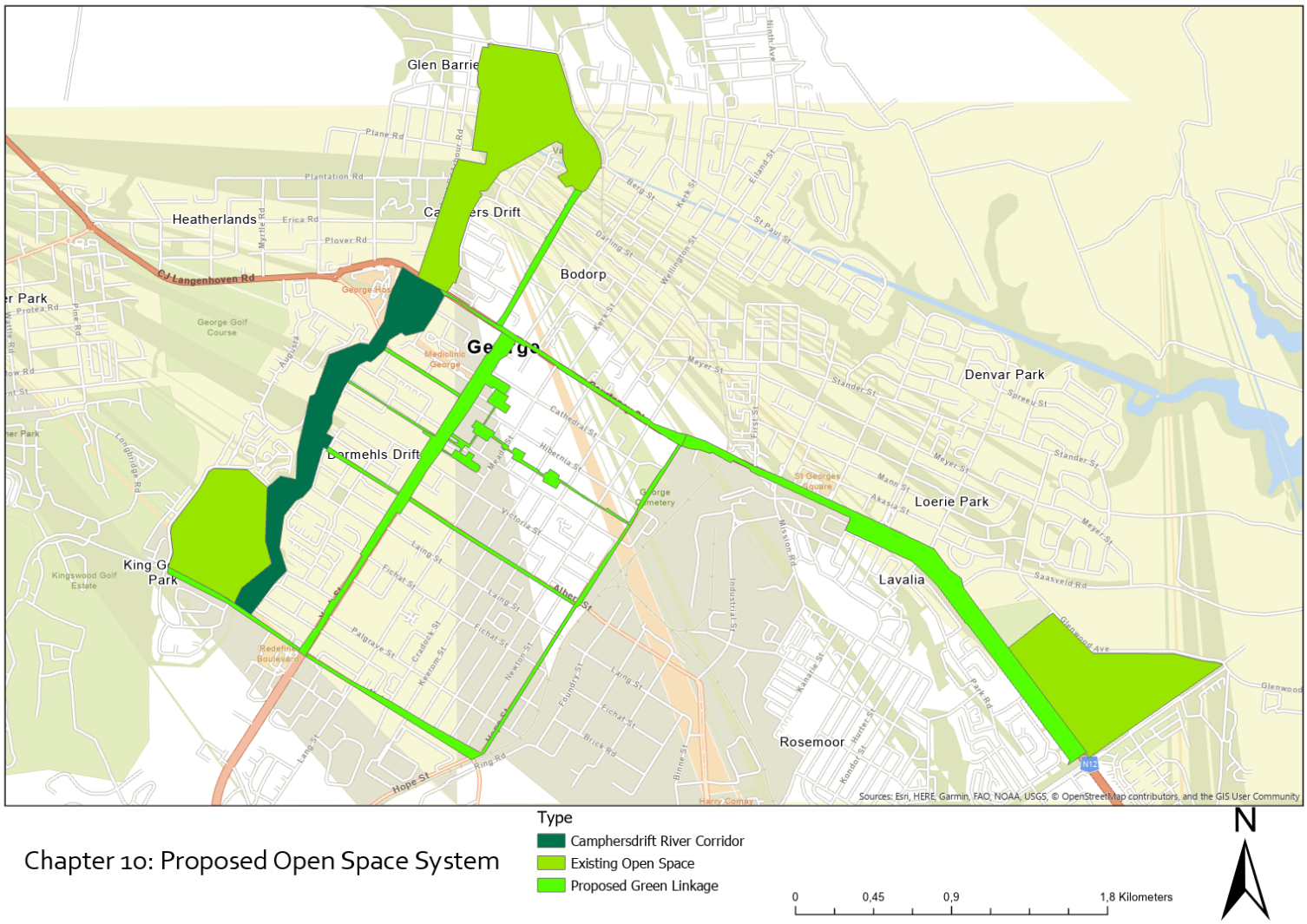


Figure 10-4: Proposed Open Space System for George City Area.

Source: Own Compilation.

10.6 Limitations of research

Possible development strategies and incorporating open spaces are limited to different urban areas, cities and countries. Recommendations can only be applied to case-specific areas, and general strategies will not necessarily contribute to sustainability. Unique characteristics have a affecting impact on the applicability of development strategies. The incorporation of South African case studies was limited during the qualitative exploratory case study research method. A lack of available and sufficient open space development cases was evident during research investigations.

10.7 Conclusion

This dissertation concludes that open spaces can be sufficiently incorporated into development strategies. Urban areas must be evaluated on merit, and all influencing factors should be considered. Development strategies, if correctly implemented, may contribute to more compact urban areas that are sustainable. Firstly, development strategies should be proposed by evaluating the opportunities and constraints of relevant urban areas. The development needs of communities will influence efficiency and sustainability. Throughout this paper, factors that influence how residents perceive open spaces were identified. These factors, if implemented correctly, may improve how residents perceive open spaces. Improving residents' perceptions may increase the frequency and duration of visits to open spaces. Thus, the residents will use open spaces and available functions in their everyday lives. This will contribute to more effective and functional open spaces in the city.

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