

Towards More Integrated Human-  
Nature Relationships: A Local Area  
Spatial Development Framework for the  
Two Rivers Urban Park (TRUP) Site

Timothy Blatch

2016

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Towards More Integrated Human-Nature Relationships: A  
Local Area Spatial Development Framework for the Two  
Rivers Urban Park (TRUP) Site

Dissertation presented of part fulfillment of the degree of  
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Timothy Blatch- BSocSci In Organizational Psychology and  
Industrial Sociology (with distinction)- University Of Cape  
Town

University of Cape Town

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Abstract

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Towards More Integrated Human-Nature Relationships: A Local Area Spatial Development Framework for the Two Rivers Urban Park (TRUP) Site

November 2016

In this dissertation, the author explores the theme and concept of enabling more integrated human-nature relationships through strategic spatial planning. The idea that ecological planning, at a number of scales, should be an integral part of the strategic spatial planning process, in order to enable this integration, was investigated, in the current context of environmental degradation as a result of unsustainable development trajectories, climate change uncertainty, social and economic inequality, the need for compaction, and the need to strategically develop well-located catalytic sites in the city. The notion of positive and sustainable spatial planning as an enabler of more integrated human-nature relationships is investigated in terms of ecological approaches to development. The current disconnection of humans and nature has long been attributed

to anthropocentric , post-industrial, and consumerist paradigms which have encouraged unsustainable urban development models, usually with assumed inevitable negative effects on the natural environment. As a result, the natural world's carrying capacity, quality, and presence in urban areas, has been severely compromised. This has limited nature's capacity to provide the necessary life support systems for humans and development and essential goods and services. This study, therefore, suggests that a paradigm shift is necessary in terms of how urban development and the natural environment interact and in terms of fostering the conditions necessary for more integrated human-nature relationships. This paradigm shift is within the realm of possibility within the ecological and spatial planning discourses. This study develops and presents a local area spatial development framework for a well-located site in the Cape Town Metropolitan area: the Two Rivers Urban Park (TRUP) site. This SDF represents the development of a spatial model for as to how more-integrated human-nature relationships can be enabled through spatial planning on the site.

The study presents a literature review of literature relevant to human-nature relationships, spatial planning, and ecological planning in order to establish a theoretical framework before conducting a multi-layer analysis of the status quo of the site. A SDF is then presented to guide responsible, positive, and sustainable development on the site over a twenty year period (2016-2036). The implementation framework is then presented before the dissertation is concluded and the major findings, recommendations, and contributions of the study are discussed. The methods and techniques used for data collection, analysis, and interpretation included case study methods, discourse and

policy analysis, desktop research, observations, non-structured interviews, mapping, aerial photography, Geographical Information Systems (GIS) analysis, and an iterative conceptual design process. The SDF was generated in response to the theoretical framework and contextual analysis of the site. The major conclusions and findings were that, through the process of developing the SDF, it is possible to exhibit how spatial and ecological planning may be integrated in order to enable and foster deeper connections between humans and nature. The framework seeks to exhibit good-practice pilot projects and strategic interventions which should be innovatively implemented in terms of satisfying the criteria of positive development, sustainability, and deeper human-nature relationships. A series of intentional and conscious eco-village type communities are envisioned on the site, whose way of life is closely connected and integrated into a single socio-ecological system with nature. Recommendations for future planning and research are presented and a personal reflection articulated before the study is concluded.

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# Chapter 1: Introduction

## 1.1 Introduction

This chapter aims to provide an introduction to this dissertation. It will introduce the context and the site, and will articulate the significance of the study. It will also articulate the aims, justification, and philosophical underpinning of the study before presenting the research questions, methods, techniques, tasks involved, limitations, structure, and ethical considerations which arise from the nature of the study. This chapter aims to frame the current problems facing the city, which this dissertation will seek to respond to and improve on.

## 1.2 Context and Significance of the Study: Framing the Problem

The precise nature of the subject matter can be better understood in relation to a planning problem facing both the site and Cape Town as a whole, and a rationale as to why the selected site is catalytic to being part of a hopeful future. For this reason, the problem is articulated and the possibilities for enabling a response to the problem on the TRUP site are explored briefly in this chapter:

Authors such as Lemanski (2004), Watson (2009), and Turok (2001) have articulated some of the main problem facing the City of Cape Town since the dissolution of Apartheid in 1994. Fragmented spatial planning, which existed during Apartheid, continues to persist into the present. The City of Cape Town, according to Turok (2001) and Watson (2009), is still facing deep social and spatial divisions. The city is divided by both race and income, with little equality, generally, in access to housing, economic opportunities, and social services and facilities. Planning and development in post-Apartheid South Africa, and more specifically Cape Town, has reinforced unequal spatial patterns of division and, as a result, a lack of integration is seen in new developments on well-located land in the city (Parnell & Pieterse, 2010). Turok (2001) advocates for a new coherent approach, based on a strategic framework, to better align broad policy statements about the need for urban integration with consistent action on the ground. This will allow for new developments and approaches to managing scarce land which are in the interests of the whole city. The TRUP site is an example of a tract of scarce land with high opportunity potential, which is mandated, according to the previous few statements, to contribute to rebuilding the Apartheid city through inclusive and equitable development. Equity, for the purposes of this dissertation, will extend to encompass the natural environment, too. With rapid environmental degradation

and worsening quality, the environment's rights to protection need to also be considered.

Watson (2009) situates the problem of inequality in Cape Town in terms of the general development trends in cities of the global south. In a context of rapid urbanisation and growing urban populations, and the subsequent rises in poverty, inequality, spatial fragmentation, and urban sprawl, cities in the global south, such as Cape Town, have seen polarized development. This has caused a situation whereby peripheral urban sprawl is the norm in Cape Town. Many poor people are pushed to the peripheries of the city, far from well-located land, economic opportunities, and access to social services and facilities. This marginalization is widening the gap between the rich and poor, and resulting in unsustainable and unequal development patterns.

Rapid urbanization and population growth in Cape Town has increased the need for housing opportunities. Current approaches by the city to provide housing, specifically low-cost, gap, and subsidized housing, have seen the rise in new housing developments and some progress has been made to address the large and growing housing backlog (Pillay & Tomlinson, 2006). However, these new housing developments are usually developed in marginal and peripheral areas and are poorly thought out in terms of improving the lives, opportunities, and access to the city for

poorer residents. Available land which is well-located in the city, close to economic and social opportunities is scarce and limited. The city, therefore, needs to maximize the use of the last remaining pockets of well-located land in the city for maximum benefit for all residents and for rigorous strategies aimed at mixed-use, inclusive development. According to Dewer (2000), this highlights the need for densification and infill development, as well as efficient public transport and non-motorized transport systems.

This research is also situated in the context of climate change and rapid environmental degradation, due to sprawling development and unsustainable livelihoods and development patterns, in the name of "economic development." As a result, a densification strategy for the city of Cape Town needs to be undertaken to prevent further urban sprawl and promote intensification of existing land opportunities in the city. Additionally, green corridors and a network of public, green, open space should be promoted to enhance the quality of the natural environment and its potential to better the lives of all residents. Providing enhanced spaces for environmental protection and enhancement will increase the capacity of the natural environment to contribute positively to the lives of residents and will enable the protection of valuable natural resources and ecosystems by functioning as the "green lungs" of the city. Unsustainable and fragmented development patterns have further lowered the quality of

the natural environment in the city of Cape Town and as a result, a new approach is necessary on well-located land within the city where environmental and urban development planning can be better integrated into the planning process.

Development itself is increasingly defined in social and environmental terms, as for example "to enlarge the range of people's choices.... including access to income and employment opportunities, education and health, and a clean and safe physical environment" (World Bank 1991). Yet planning for development remains largely the work of economists and mainstream urban and regional planners, while planning for the biophysical environment remains the separate work of environmentalists, ecologists, and resource managers of various kinds. This is so in spite of the fact that it is at the regional and local level--the level of traditional planning activity--that conflicts between environmental conservation and development planning become most apparent (Crowfoot and Wondolleck 1990, Lang 1986). Rather than integrating biophysical concerns into urban and regional planning, a separate discipline and profession of environmental planning seems to have emerged. The environment and development can no longer be approached separately, as the concepts of sustainable development and sustainability have implied since the early 1970s.

The above section has shed light on a few key issues facing the city of Cape Town. It has also highlighted the importance of the limited availability of well-located land for both future development and environmental protection and enhancement. Therefore, remaining tracts of land in the city need to be planned for holistically to facilitate both development and environmental initiatives. In the past, spatial development planning has been synonymous with inevitable negative impacts on the natural environment. Accordingly, engagement with the natural environment in spatial development planning has been in the form of mitigation of negative impacts. This model of development, which shows little priority for strategic environmental planning, has resulted in the polarization of environmental and development objectives. This highlights the need for a new model of strategic spatial planning which seeks to propose positive development in order to aim at net zero loss in terms of environmental and ecological impacts, in the planning phase, before development is proposed, and before environmental impact assessment (EIA) is carried out.

Therefore, the problem statement is as follows:

There is a lack of successful integration of environmental management in spatial development planning at a local scale in Cape Town and in previous plans, documents, and realities for and on the TRUP site. This leads to the question

of how the development of the TRUP site can be planned to optimize future social and ecological wellbeing.

### 1.3 Aim of the Study

Building on the vast opportunities the chosen TRUP site presents, this research aims to develop a Local Area Spatial Development Framework for the Two Rivers Urban Park (TRUP) site to guide the future development and management of the area towards more integrated, holistic, and replicable relationships between humans, development, and nature. The aim is to enable, through effective planning and management, better integration between stakeholders and beneficiaries in facilitating new and improved relationships between humans and nature to achieve more environmentally sensitive urban development. Furthermore, the aim of this dissertation is to contribute to ideas around the need to improve human-nature relationships for sustainable futures in South Africa, and more specifically Cape Town. In doing so, this dissertation will go beyond planning, environmental, and development theory recommendations to serve as a replicable example of a twenty-year holistic and integrated local area spatial development framework which will develop strategies to physically and practically demonstrate improved environmental, developmental, and social sovereignty.

With more specific reference to the TRUP site study area, the aim is to promote environmental and ecological recovery, enhancement, and well-being in planning for human and social development. In this way, this research will develop ways to get the site onto a more life-enhancing, ecologically sustainable path within the planning discourse around the City of Cape Town's planning and development needs. The framework seeks to nurture rich livingness for both nature and humans on the TRUP site by imagining new ways of living and developing with nature, learning from nature's cyclical and resilient processes, and shifting the mindset of the city of Cape Town towards a more innovative and equitable paradigm. The framework will act as an catalyst for promoting deep human-nature relationships which will hopefully inspire urban planning, urban design, other practitioners, and the wider Cape Town area.

### 1.4 Justification and Purpose of the Research

In the context of rapid urbanization and the need for densification and infill development, as well as the context of rapid environmental degradation and climate change, the need for planning to engage with a dual mandate of integrating environmental and development planning is highlighted. It is recognized that environmental and

ecosystem planning cannot be separated from urban development planning. A holistic approach is advocated for, in which more integrated human-nature relationships are enabled at a local neighbourhood scale.

In South Africa, the Municipal Systems Act (2000) mandates the creation of Spatial Development Frameworks (SDFs) and local area plans to guide the future development of the country. In Cape Town, the SDF has been finalized and the focus has shifted towards local area planning at a neighbourhood scale to give effect to the principles in the city-scale SDF. There have been many attempts to integrate environmental planning within urban development and spatial planning. However, much of this environmental planning has taken place at a bioregional scale, due to a push in the literature towards holistic bioregional planning. This has caused widespread confusion due to the fact that bioregional boundaries do not always coincide with jurisdictional or administrative boundaries. As a result, much of the environmental planning has seen to be more relevant at a regional and metropolitan scale. This research attempts to reconcile both environmental and urban development objectives to better integrate environmental planning into the urban planning process. It will attempt to show how this integration is made possible at a local area and

neighbourhood scale to enable more integrated human-nature relationships.

The focus area of this research, therefore, is on the intersection between human development and the natural environment and the inseparable interplay between the two. The focus, therefore, is more narrowly defined as the integration between urban and environmental planning, at a local area scale, in order to advocate for a more comprehensive approach and new ways of planning for new and sovereign human-nature relationships on the TRUP site. The integration of human and ecological wellbeing is at the center of the research in order to resolve some of the green-brown, nature-development polarizations common in urban planning and design and contribute to more enlivening links between humans and nature in urban areas.

I expect to make recommendations for new development on the TRUP site, which enable, through design, better integration between humans, development, and nature. I expect to make recommendations for future development and environmental planning on well-located land in the Cape Town metropolitan area, as well as recommendations for planning policy and urban design around sustainable and “green” livelihoods and new human-nature relationships based on the research findings through the development of a revised Spatial

Development Framework (20 year plan) for the site. Different to the previous project on this site, the framework will be improved through the lens of permaculture and biomimicry principles. Above all else, I plan to make recommendations for the ways in which urban and environmental planning may be better integrated, in a holistic approach, which seeks to benefit both humans and the environment.

### 1.5 Philosophical Underpinning and Ethical Standpoint

My philosophical standpoint is one which is pro-poor and pro innovation to enable new ways of living and integrating humans and nature on catalytic sites in the City of Cape Town, such as the TRUP site. I believe that while Cape Town has come a long way in redressing its fragmented past, the approaches to new developments within the city have not been rigorous enough to effectively address both the development and environmental needs of the city. With limited land that is well-located in the city, the time is now to make best use of the last tracts of land to build inclusion and work towards a sustainable future. I believe that there is space for creative ways for urban design and planning to engage a range of stakeholders in new processes around sustainable lifestyles, integrated water resource management, better food security, and improved relationships between humans,

development, and nature. For this to become a possibility, planning should adopt a more holistic approach which better integrates development and nature. I believe that Cape Town is at a crossroads and must be rigorous in enabling catalytic projects, which promote integrated human-nature relationships, on key sites, such as TRUP, in the metropolitan area.

Furthermore, I believe that the capacity of the natural environment for resilience against the impacts of urban development is limited and that humans, as custodians of the land on which we live, should begin to imagine new ways of living with nature in the City, so that nature and humans can dwell together more symbiotically. It is my belief that environmental, social, and economic sustainability cannot be separated from each other. Instead, replicable mixed-use developments on well-located land in the City of Cape Town need to be explored in order to enable a more just, sustainable, and holistic future for the residents of Cape Town. This is especially relevant on the TRUP site, with its valuable water systems, natural open-space environment, and room for development.

### 1.6 Scope of the Study

The scope of this dissertation is at a variety of scales. Contextual analyses will be done, firstly, at a city scale in order to understand the context in which the TRUP site is situated and its role in the greater Cape Town metropolitan area. Secondly, analyses will be conducted at a neighborhood/local area site scale in order to understand the range of processes and factors which make up the site and, therefore, will inform the interventions. Strategies and interventions will be provided, too, at a range of scales. Some strategies will be aimed at city-scale metropolitan interventions, while others will be site-specific local area/neighborhood strategies and interventions. In order to best illustrate and effectively articulate the strategies in the proposal, the precinct scale will also be used in some strategies. The theory, analyses, and interventions in this dissertation span a number of disciplines and fields and the product will illustrate how collaboration between these various fields can be successfully and effectively achieved to enable holism and comprehension.

The product of this dissertation is a Spatial Development Framework for the TRUP site at a local area/neighborhood scale in order to provide guidance for development and environmental well-being over a twenty year timeframe. The expected research outcome is to put forward an SDF with ecological planning sustainability and resilience at its core. This aims to promote environmental wellbeing, recovery and enhancement while improving

human nature relationship. The plan will serve to guide public and private investment and spending, as well as provide a framework for multiple stakeholder engagement in the ecologically sensitive development of the site in order to facilitate and enable a holistic approach to more integrated, meaningful, and close relationships between humans and nature. The role of planning in integrating environmental and social, urban and ecological, and development and natural concerns is highlighted throughout. The SDF will provide a replicable example of how human-nature relationships can be strengthened to become more integrated through local area planning. Local area scale planning will be used to demonstrate how the field of planning can better incorporate integration between development and nature. The location of the TRUP site, within its local municipal and provincial context is shown in Chapter 3 below:

### 1.7 Introduction to the Study Area: TRUP

The TRUP site has the unique potential to be catalytic to the entire city of Cape Town and its future development. Primly located at the intersection of seven different neighbourhoods, and marginal and well-served areas, the TRUP site is in close proximity to the CBD of Cape Town and economic and social opportunities are easily accessible from the seven train stations which surround the site. The

presence of the Black and Liesbeek Rivers and a valuable natural environment allow this site to be catalytic, not only in terms of future development projects, but also for urban recreation and natural enhancement projects to be combined. This highlights the opportunities on the site for the development of new and potentially replicable ideas around human-nature relationships, at the intersection of the development and environmental needs of the both the site and the larger city. The site offers the potential for a more holistic and integrated planning approach to facilitate new developments in line with the city-wide mixed-use densification strategy and the environmental and recreational needs of the city. One way of integrating human developments and approached to working with nature (or environmental management) better is through Integrating environmental and ecological planning deeply with spatial planning, which will be explored. New ways of living and interacting with nature, which are more sustainable and appropriate to the context of Cape Town, have the potential to be promoted on the site in order to enable a mix of uses and people in a live-work-play environment. This will be promoted through environmentally-sensitive design strategies, and the principles of biomimicry and permaculture, engaging a range of stakeholders. There are also vast opportunities for public transport and increased access and linkage throughout the metropolitan area on the site as it is located

at the intersection of many different transport routes, train stations, and current and future development corridors.

At the present moment, there has been no environmental framework completed for the site. The environmental attributes for consideration in development proposals, are guided by the city of Cape Town Environmental Management Framework (EMF). This framework covers the site and earmarks it as an important site for green open space and biodiversity considerations. However, the scale of the EMF is too large to deeply capture the essence and full environmental potential of the site. As a result, site-scale interventions and strategies will be centered around the natural environment and the potential to positively affect it at a local level though development which is ecologically sensitive, innovative, and based on integrated principles of human-development planning for sustainable futures.

## 1.8 Previous Engagement With The Trup Site And Site Choice Rationale

It is necessary to state upfront that the researcher has previously engaged with the TRUP site in 2015. This engagement was in the form of a Spatial Development Framework for the site and detailed precinct plan for the Oude Molen Eco-Village. It was the researcher's first project within the discipline of City and Regional Planning as a

requirement for completion of the Studio A course for Masters in City and Regional Planning at the University of Cape Town. The focus of the project was on catalytic sites in the Cape Town Metropolitan Area. Engagement with a full and comprehensive analysis was limited due to insufficient experience on the researcher's part and the time constraints and took the form of principles of good settlement making. The engagement with the site throughout the duration of the studio A course left many unanswered questions for the site in terms of its regional significance for continuous green infrastructure and the possibility for innovative ways of thinking about humans and nature. Furthermore, not enough attention was paid to the natural environment and the interplay between the environment and the proposed future urban development. Furthermore, the plan produced in 2015 lacked depth and was not comprehensive as it was completed as a "Capital Web" (Crane, 1960) which is a partial plan which is centered around public space and how these spaces are framed by development. It is necessary, therefore, to revisit the site and engage deeper with its incredible potential in terms of both future development and environmental planning. While analysis work will be re-used from 2015, the proposal and SDF, which this research seeks to produce, will be completely original and will be reimagined in a way which is separate to previous proposals and ideas for the site as it will take on considerations beyond public space and good settlement making through the lens of more

integrated human-nature relationships. Essentially, it will seek to improve on the work done in 2015 and fill in the gaps with regards to new ways of imagining the interplay between human development and the natural environment through the principles of permaculture and biomimicry.

## 1.9 Research Questions

Below are the research questions which guide this research.

### 1.9.1 The Main Research Question

How can a more holistic approach to urban and environmental spatial development planning enable more integrated human- nature relationships on the TRUP site?

### 1.9.2 Subsidiary Research Questions

What is the nature of the current relationship between the natural environment and humans in Cape Town and on the TRUP site?

What new ways of thinking and living might be incorporated and mainstreamed into spatial planning to ensure a more sustainable future for cities?

What might planning learn from the principles of community-making through biomimicry and permaculture?

How could more integrated human-nature relationships benefit the city and the region?

How could planning for better integrated human-nature relationships in local area spatial planning help achieve the goals of the SDF, IDP, PSDF and NDP?

How may environmental management and planning be better integrated with planning for urban development on a local area scale?

How can the TRUP site be planned for future development to optimize both social and ecological wellbeing?

How may neighbourhood and settlement making be more sensitive to the environment on the TRUP site?

How may the principles of Permaculture be incorporated into the Spatial Development Framework for the TRUP site to enable more integrated human-nature relationships?

Are more integrated human-nature relationships possible on the TRUP site? If so, what is the role of planning, on a local level, in enabling this?

Are there ecological limits to growth in this region? Can this region be (more) self-reliant? What are the links and trade-offs between economic, sociocultural, and ecological sustainability in this region?

How do and should human-nature relationships play out in space?

What is the role of spatial planning on a local area and neighborhood scale to enable more integrated human-nature relationships?

What are the implications for ecosystem planning at a local level and what are the roles of the various stakeholders in enabling integration of environmental planning within the urban development discourse?

How can design within the disciplines of city planning, ecology, environmental management, biology, and urban design offer alternative and more sustainable ways of living, which may contribute to South Africa's housing policies and implementations?

How can the urban poor benefit from more sustainable integrated spatial planning?

In what ways may intentional communities develop on the site around sustainable ways of living?

How can a local area plan enable spatial planning which has ecological and social sustainability at its core?

How might planning engage a range of stakeholders and disciplines in an integrated approach to ecological development planning?

How may positive development with zero-net loss and positive impact on the environment be imagined so as to contribute to replicable ideas within the planning discourse and policy in South Africa?

## 1.10 Ethical Considerations

The ethical considerations involved in this research are minimal and the approach to this research will be ethical throughout. Interviews with residents on the site and people from relevant institutions will require an ethics form and the approach to interviews will be done so as to ensure the highest code of ethics in every aspect of this research. Interviews with practitioners and residents will not be formally conducted or pre-determined. In this way, there will be no structured questionnaire for conducting interviews. Instead, interviews will take the form of discussions around idea sharing. Consent forms will be used for each interviewee before using their names or credentials. A copy of the consent form is included in

Appendix 1. Furthermore, ethical clearance to undertake the study has been applied for and granted (shown in appendix 2) for the methods and techniques used.

## 1.11 Methods

This section provides the methods and methodology used to answer the research questions of this dissertation. It seeks to justify the chosen methods and procedures to be followed in order to develop the spatial development framework for the TRUP site. The methodology aims to set out each phase of the research process and detail the plan formulation in terms of achieving the research aim and answering the research questions. In this way, the methodology will set up the systematic process for contributing to the solution to the research problem and will detail the motivation behind choosing the specific research methods. The research methods are the techniques and tools used in the research methodology.

### 1.11.1 Methods of Research

A research method, according to Cameron (2014), is a process used to gather information and data. According to Yin (2009), three factors should be taken into account when choosing appropriate research methods (insert pic). They are:

- The type of research questions
- The required amount of control over events
- Whether or not the research is focussed on contemporary events

This research will make use of both qualitative and quantitative methods in a mixed-methods approach. This approach is defined by Burke Johnson et al. (2007: 123) as being “the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration.” This means that some of the research will be in the form objective, scientific, numerically-based quantitative data (eg. Demographics, land capacity, program etc) while some will be in the form of subjective, interpreted qualitative information (eg. Interviews, past policies and plans, legislation, text, images, history and cultural information). Since this research ultimately seeks integration between various fields of study, areas of theory, and human and natural processes, the approach will be termed “integrative” (Burke Johnson & Onwuegbuzie, 2004). By combining methods, processes, and fields of study, integrative research controls for the biases involved in any one of the particular methods. It also allows

investigation from a number of different angles to develop a holistic understanding of the reality for the site. Integrative research flexibilises the entire research process with intentional method variation to achieve holism. In this way, the validity of the methods used in this dissertation is ensured through the use of mixed methods and a range of data inputs. In this way, the shortfalls of each single method is controlled for with the use of the others.

Furthermore, this dissertation will make use of empirical research as a method. This research method is based on the researchers own observations of people and the site and will be used as part of the contextual analysis in mapping and spatial interpretation of the status quo.

In terms of sources of data, the time constraint of five months for this research (as stated in the limitations) does not allow for a significant amount of primary data to be sourced. As such, primary data is limited to a few brief one-on-one conversations with professional practitioners in the fields of development and environmental planning, and the websites of various stakeholders and municipalities. Primary data is defined as being original material collected by the author at the current time (University Libraries, 2010). As a result, this research draws primarily from secondary sources, defined by University Libraries (2010) as being interpretations and evaluations of primary data sources

which are discussions of evidence, rather than evidence themselves. Secondary sources of data will include websites, journal articles, theory papers, and unpublished writings. Some of the more specific methods to be used are detailed below:

#### 1.11.1.1 Case Study Research Method

This dissertation will make use of the case study research method for the TRUP site. It is defined by Yin (2009, 18) as being “an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between the context and phenomenon are not clearly evident.” This method, according to Fellows et al. (2003), involves a variety of data collection sources and allows the production of context-specific, value-driven knowledge (Flyvbjerg, 2006). The case study method is especially useful in acquiring in-depth information within a specific geographical location. According to Yin (2009), case study research does not necessitate a specific kind of evidence or data (for example, qualitative or quantitative) and information can come from a variety of sources. In this way, the integration of the two fields of spatial planning and ecological planning can be enabled. This is useful for my research, as I cannot use primary research and quantitative data collection because of time constraints. Therefore, I use a range of secondary data sources,

historical sources, my own observations as well as those by other individuals in the field to explain how the current situation and status quo operate

The analysis, intervention, and implementation phases of the SDF development process will all seek to use the site as a case study for analysis to draw out a wide variety of information which will inform interventions and a spatial development framework for the site. This method enables the complexity of the neighbourhood to be best understood and enables deeper insight into understanding how a wide range of factors and processes interact to produce the unique character of the area under study. This method cannot be used to draw generalizations, test hypotheses or contribute to theory. However, the benefit of this method is that it is guided and supported by the development of a strong theoretical framework, which will be established in the next chapter as a literature review (Yin, 2009).

The case study method will be used only to represent information regarding the specific context of the site for this dissertation. The case study method, however, has been questioned and critiqued for taking on a “vexed position” and for its inability to draw generalizations (Gerring, 2004: 341; Flyvbjerg, 2006). Flyvbjerg (2006) recognizes that although the knowledge provided through this method cannot be generalized, it is often transferrable. From an

understanding of the TRUP's specific context, which will be derived from the case analysis, this dissertation seeks to provide a set of solutions for the TRUP site that may be transferrable to other similar contexts. However, in terms of aims, this research is less concerned with generalizing from a case study for the purpose of applying findings to other contexts. Instead, one of the aims of this research is to understand and learn as much as possible from a specific case study (TRUP in this example) in order to establish planning policies, directives and interventions for the case under study (and not, necessarily, for other contexts). It is intended that rather than attempt to draw generalizations, this dissertation will attempt to generate solutions and ideas which may be transferred and adapted to other similar contexts.

Because there is no predetermined design for the site, and because the process is not linear, the bias towards verification in the case study method, as lacking academic rigor, will be controlled for through constant ensurance of accurate and non-biased data representation. This will be achieved by including a range of stakeholder information in the development of the plan, through a careful analysis of the public participation process and various agendas which should be balanced. The iterative process of back and forth engagement with the analysis and the design proposal allows for the design process to be carried out effectively. Additionally, this method will enable the most

comprehensive understanding of a single site within its context, in order to develop ideas that may be transferrable to other contexts within the city, region, and rest of the world.

#### 1.11.1.2 Discourse and Policy Analyses

These methods inform an approach to analysing written, verbal, and other texts to inform research. These method will be used to analyse previous public policies and plans relevant to the site and the relevant legislation in achieving a holistic understanding of the current situation on the site to inform interventions and design strategies. Furthermore, the discourse analysis will highlight the role of planning for more ecologically-sensitive development at a local scale to enable more integrated human-nature relationships. According to Wilson (2001), the purpose of the discourse analysis is to improve policies and discourses which are relevant to the research field in study. In this way, gaps, inconsistencies, and shortcomings in the discourse and policy aorund the subject, in this case "More integrated Human-Nature Relationships," can be identified for the relevant interventions to be proposed. In this way, the integration of human development planning and environmental planning, which facilitate human-nature relationships on a local and city scale, will be analysed to either substantiate or disprove the current relationship.

Although this method is subject to bias and the researcher's personal interpretations, it is applicable to every situation and subject and is very useful for analysing policy and precedent critically.

#### 1.11.2 Research Techniques

Having detailed and justified the chosen research methods of this dissertation above, the research techniques employed in this dissertation are explained below. Research techniques differ from research methods in that the latter refers to the process of data collection whereas the former refer to the strategies by which the data is collected.

##### 1.11.2.1 Desktop Research

A desktop study technique assists in gathering data relating to the relationships between humans and nature and the need for spatial planning to intervene/not intervene. This desktop study will analyze the current state of human-nature relationships in spatial planning literature.

##### 1.11.2.2 Literature Review

The starting point for this dissertation will comprise of a literature review in order to critically assess the literature and theory around humans, nature, and the relationship between them. This literature review will set up a theoretical

framework within which this dissertation will lie. It aims to engage literature and theory about the need for more ecologically-sensitive spatial development planning to enable more integrated human-nature relationships and sustainable ways of living at a local scale, within the city, national, and global discourses.

##### 1.11.2.3 Non-Participant Observations

Field observations, through photographs, site visits, and mapping will also be used as research techniques. These techniques will enable passive observations as an outsider. This technique does not require special recording equipment and is amenable to different contexts to provide information from spontaneous, unplanned events.

##### 1.11.2.4 Non-structured interviews

Where necessary, non-structured interviews will be used to gather information about the current state of human-nature relationships in spatial development planning, and the integration, or lack of, of development and environmental planning. The technique of non-structured interviews allows for the nuanced flow of ideas through conversation rather than prescriptive and structured guiding questions which may limit the scope of the interviews. Furthermore, approaches to planning on the site and contestations around plans and personal experiences

and expectations of residents and the different spheres of government will be explored. These interviews will allow for a range of data collection sources within the practice, and fields of study and will aid in legitimizing and enriching the literature review and contextual analysis chapters of this dissertation. The types of interviewees, which I expect to interview, are practitioners in urban planning and natural resource management fields, as well as local residents, academics, and city officials. Non-structured interviews, with the absence of predetermined questionnaires, will enable open discussions and sharing of ideas and strategies. The idea is that these interviews- more conversations- will invite the involvement of professionals and compliment the discourse and policy analysis by involving a range of interviewees in the analysis process.

#### 1.11.2.5 Mapping, Aerial Photography, and Geographical Information Systems (GIS) Analysis

The spatialisation of data and the proposal of a spatial development framework are central to this dissertation. As a result, it is important that each phase of the analysis, proposal, and implementation processes is spatially represented and understood in order to effectively make decisions which will affect space. Mapping, aerial photography, and GIS will be used as tools to understand the site and its specific conditions, opportunities, constraints, and limitations spatially. This will aid in providing

situational context, as well as analytical depth in understanding the TRUP site. Mapping will involve the overlaying of layers in order to attempt to understand spatial relationships between multiple processes. This will enable the revelation of spatial trends to inform area-based spatial planning for the site.

#### 1.11.3 Design Process and Development Outcomes: Overview of Approach

As previously mentioned, this study focuses on the TRUP site and its future development. The product of this study will be a spatial development framework with a local area spatial design strategy to improve integration between humans and nature. It aims to provide possible innovative ways to facilitate more ecological planning, strategically, at a local scale in South Africa. It sets out a framework for how public funds and private sector investment, alongside a range of other beneficiaries, stakeholders, institutions, and practitioners, may be allocated in order to begin reimagining human relationships with nature and new ways of living and contributing to sustainable positive development in the future. Following a detailed literature review, the design process for the TRUP site will begin with a metropolitan analysis in order to understand the significance of the site in the context of the City of Cape Town and its important role in the future sustainability of the city. This will include an analysis of the metropolitan

structuring elements in the CTSDf to give a context for the spatial location of the site. The role of the TRUP site as being a part of the metropolitan city structure will be analyzed.

The analysis will then continue at a local level, analyzing the surrounding neighbourhood context within which the TRUP site sits. This will aid in understanding the ecological and developmental context of the site and its surroundings. This analysis will culminate in the identification of site-specific opportunities and constraints which develop from an integrated analysis. These will inform the design proposal process.

The justification for large-small scale analysis and designs lies in the logic that larger scales “identify the minimum necessary strong actions required to give overall direction. These decisions, in turn, represent fixes which are passed onto successively smaller scales” (Dewar & Louw, forthcoming: 17). In this way, the site and design implications of the proposal and implementation are a small part of a larger developmental, policy, discourse, legislative, environmental, and spatial context. Information, therefore, is gathered at all scales to identify the need for intervention based on the status quo and how it is expected to change.

Once a thorough contextual analysis has been undertaken at a number of scales (metropolitan, neighbourhood, and

local), the status quo with regards to human-nature relationships, the natural environment, and the development context will become apparent. This information, along with a thorough analysis of the policies and plans for the area in the past, will directly inform the spatial development framework which will be presented in chapter four as the product of this study. According to Steenkamp and Winkler (2014), this approach of incorporating different design layers through a process from broad conceptual design principles to detailed implementation strategies is known as the “Package of Plans” approach. This approach guides the reader through the design process towards the final proposal where interventions will cover a range of scales: from design on a metropolitan scale, to detailed precinct scale examples of design outcomes. Throughout, consideration for linking policy through the spheres of government in South Africa is carefully undertaken in order to align the proposed framework with metropolitan, provincial, and national objectives.

1.11.4 Data analysis and interpretation will occur as follows:

Data will be collected from a range of sources and maps. Spatial data is the most important and will be used vigorously. The data will inform a contextual analysis which will be analysed to come up with opportunities and constraints for the site and a set of key problems and issues

to be addressed. Informed by the contextual analysis of the site and the relevant theory and literature review around the aims of the research, the data will be interpreted to inform meaningful strategies and designs for implementation on the site and how these can be managed, monitored, and phased. This dissertation will analyze the research findings based on themes or categories established from an in-depth review of the relevant literature, provided in the next chapter. Findings will then be coded in accordance with identified themes and categories by focusing on key concepts, principles, constructs, trends, and relationships.

#### 1.11.5 Ethical Considerations that Arise from Methods and Techniques

In terms of ethical considerations, the non-structured interviews involve contact with humans and therefore must comply with a high ethical standard. As a result, each interviewee will sign a consent form before participation in order to obtain their permission for the data gathered to be used in the research, as well as permission to use/not use their credentials, as per the successful ethical clearance of this research (Appendix 2).

#### 1.11.6 Tasks Involved

More broadly, the tasks involved will be collecting data from a range of sources, conducting a literature review, conducting a contextual analysis of the site, highlighting major issues and opportunities and constraints to be addressed in preparing integrated strategies and a detailed implementation plan before concluding with findings and recommendations for planning and future development in Cape Town.

#### 1.12 Limitations of the Research

There are a few limitations to the research conducted in this study. The first, and largest limitation is the time constraint in which this dissertation is undertaken. Having only four months to complete the dissertation process, from its inception, its literature review, and its analysis, through to the plan and then its implementation and recommendations for the future, is a major constraint on both the breadth and depth of the research and the amount of primary data that will be used. As a result, this study will serve as a first draft SDF which would need to engage with a deeper range of stakeholders and primary research data collection in the future to be more contributory to the field of study which it is embedded in. Additionally, a fully comprehensive site analysis should

include the expertise of a range of stakeholders and practitioners in a process which is usually long and extensive, beyond the time limits of this dissertation.

The second major limitation to the study is the fact that the development of a Spatial Development Framework should be deeply embedded in a thorough public participatory planning process which should integrate a range of stakeholders in an inclusionary, bottom-up method. Unfortunately, the level of public participatory planning necessary for a study such as this, was not possible under the time constraints discussed above. As a result, this dissertation should, in the future, become open to participation from a wide range of beneficiaries and stakeholders in order to improve its legitimacy and gain support for its strategies, proposals, plans, and implementation framework.

The limitations to the study, discussed above, will be addressed as best as possible by using a number of previous policies, plans, and documents, which have included public participatory planning processes, in the process of developing this dissertation, in order to understand the site from a range of perspectives. Additionally, practitioners who have worked on the site in the past, or who are currently working on the site, will be consulted in order to increase the depth of the data and contribute to some primary data for this study. Furthermore,

the limitations discussed above cannot be resolved in the scope of this dissertation. Rather, the final chapter will flag certain areas of the study for future research or more depth analyses. In this way, this dissertation is merely a single contribution to research of this kind, at this scale, in this field.

### 1.13 Structure of the Study

The following chapters in this dissertation will be structured as follows:

Chapter 2- This chapter will provide a literature review regarding the relationships between humans and nature, as well as review literature relating to the principles of biomimicry and permaculture in facilitating more integrated human-nature relationships in the context of the TRUP site. This chapter serves as a means of gaining a deeper understanding of the theoretical perspective which will frame this dissertation and proposal for the TRUP site.

Chapter 3- In this chapter, a comprehensive contextual analysis of the TRUP site will be provided in terms of its natural and human aspects, as well as an analysis of relevant legislation, policy, and previous discourses around the development of the site. This aims to establish a contextual understanding of the many processes and aspects of the site which the proposal, in the following

chapters, will respond to. This analysis will extend to the natural systems and previous development of the site in order to understand its specific elements which require retention or change. This chapter will also highlight major current trends which emerge from the analyses as well as opportunities, priorities, constraints, and issues. Furthermore, consideration for current and future land use will be analyzed.

Chapter 4- Chapter 4 will introduce a Spatial Development Framework for the site which seeks to build on the insight gained in the previous two chapters. This framework will take the form of a twenty year local area Spatial Development Framework which aims to guide future development and investment on the site towards the vision of enabling more integrated human-nature relationships.

Chapter 5- In this chapter, a short-term, medium-term, and long-term implementation framework will be provided to give direction to the plan proposed in chapter 4. This implementation framework will detail how the proposed development will take place over twenty years and which relevant stakeholders and funding will need to be engaged with. Additionally, this chapter will provide details as to how aspects of the proposed plan and design will be managed and governed.

Chapter 6- The final chapter of this dissertation will put forward recommendations for city and local urban planning and design, in terms of the replicability and further research questions that arise out of the proposal and the study. A discussion will follow the recommendations in order to discuss the various findings and their ability to contribute to knowledge and future planning interventions. Additionally, this chapter will include the conclusion to the study.

## 1.14 Conclusion

This chapter of the dissertation has provided an introduction to the study and research by briefly framing the spatial planning to be addressed by the spatial development framework which this dissertation will propose. It has highlighted the need for intervention in planning to better facilitate integrated spatial planning between human and natural systems so as to integrate ecological and environmental planning in spatial planning at a local scale. Having discussed the methods and techniques, and provided the limitations, ethical considerations, and structure of the document, this chapter can be concluded. The following chapter provides a review of literature and discourse around human-nature relationships in the development and environmental context and the integration (or lack of) between the two. A

theoretical framework will be provided through which the strong set of values to guide the development of the local area spatial development framework are developed.

## Chapter 2: Literature Review

### 2.1 Introduction

'The major problems in the world are the result of the differences between the way nature works and the way people think.' (Bateson, 1979: 161).

"The State of the World 2010 report calls for one of the greatest cultural shifts imaginable: from cultures of consumerism to cultures of sustainability. It advocates rethinking the foundations of modern consumerism – the practices and values regarded as 'natural', which paradoxically undermine nature and jeopardize human prosperity."

From State of the World 2010 Foreword by Muhammad Yunus  
Founder, Grameen Bank and 2006 Nobel Peace Laureate.

We are living in a time of great precarity because the invaluable resources which the earth provides us in order to sustain human life, food, energy, materials, shelter, livelihoods, transport, and water, are finite and under immense pressure from unsustainable development that has put intense strain on the natural environment's capacity for resilience and the sustainability of human life into the future. Human development has occurred, largely,

at the expense of this natural environment in a way which has surpassed nature's carrying capacity. This unsustainable, extractive, and consumerist relationship between humans and nature has resulted in an environmental crisis and calls for a paradigm shift in rethinking the role of natural resources in human development. Furthermore, the role of planning and planners in this changing and turbulent environment has come to the forefront in developing new understandings for conducting our relationship with the natural world.

This literature review provides a context/ point of departure and some definitions of natural resources and sustainability in order to set the stage for the articulation of various paradigms which exist within the field. The need for a paradigm shift in the way human society interacts with the natural environment and its resources is highlighted by the important role nature plays in sustaining human life before a discussion on sustainable ways of interacting with nature are presented. Helpful planning approaches, discourses, current debates, and contestations around spatial and ecological planning will then be discussed. A personal reflection of the literature, the role of the planner and planning in affecting the changing worldviews, and recommendations for a sustainable future are then presented before the chapter is concluded. Throughout the literature review, my personal worldview is made evident, supported by various literature and authors.

## 2.2 Point of Departure

The point of departure for this dissertation is that the natural world's capacity to provide for extraction (sources) and absorption of emissions (sinks) is limited; thus infinite economic growth based on the current extractive and destructive model is not possible, and human activities and worldviews which hold such a position, need to be radically altered to bring us within the Earth's carrying capacity (Pierce and Mader 2006). The transition to more sustainable ways of living, according to this dissertation, is therefore an urgent priority. Since our social and economic systems function within the natural environment and are completely dependent on it, economic and social sustainability are only achievable if environmental sustainability is achieved. According to Wilkinson et al. (2013), the challenge for policy-makers and planners at the urban scale is to enable the creation of ecologically sustainable urban areas which reconcile urban development with the biosphere.

The myth of separation of nature and humans tends to perpetuate the misguided belief that there must be a trade-off between conservation and social development, and that preservation of natural landscapes separate to human activities is the only viable management response (Cronon 1996; Katzschner 2013). Rather, it is now becoming

clear that humans can have a positive relationship with nature, by embracing a worldview based on regeneration and renewal rather than domination and depletion (Brunckhorst 2000; Ernstson and Sörlin 2009; Katzschner 2013).

### 2.2.1 Natural Resources and Sustainability Explanations

The term 'resources' implies human use in the form of sources, sinks and other ecosystem services. However, it also implies resources in terms of beauty, recreation, and an important factor to be included in human well-being. Thus, wherever the term 'resources' is used in this dissertation, it is not intended to imply that natural systems are only considered worth protecting or enhancing when they are of direct use to humans. The beauty, integrity and stability of natural systems should be protected, with the holistic view of nature as a community to which we belong, rather than a commodity which belongs to us (Leopold 1949).

Theorists from a number of fields and disciplines have long debated the definition of sustainability. It has various definitions and meanings ascribed to it, which have evolved over time. It is a multiple and flexible concept deployed in various ways, with a diverse range of possible effects and political implications. For the purposes of this dissertation, the concepts of sustainability and sustainable

development are explained and defined in terms of the following discussion:

The concept of sustainability, according to Yigitcanlar and Dizdaroglu (2015), emerged in the 1970s in response to increasing concerns about the negative impact of human development activities on the natural environment. In his book, "The Ecology of Commerce: A Declaration of Sustainability," Hawken (1993: 139) describes sustainability as a manifesto for change: "Leave the world better than you found it, take no more than you need, try not to harm life or the environment, make amends if you do." The Commonwealth of Australia, in 1992, developed a set of core objectives of sustainability as follows: Enhance individual and community welfare by following a path of economic development that safeguards the welfare of future generations, provide equity within and between generations, and protect biological diversity and maintain ecological processes and life support systems.

Recently, sustainability has become a core component in government spatial policies and legislation around the world. It aims to achieve the global goal of balancing three components of urban development: social welfare, economic development, and environmental protection in response to the growing awareness that environmental problems, and their subsequent effects on climate change and the city, are a global concern (Yigitcanlar and

Dizdaroglu, 2015). This echoes the point of departure for this literature review, in the sense that sustainability offers potentially new ways of thinking about the relationships between humans and the natural environment around them. According to Baker (2007), the term sustainability refers to the balance between humans and the natural environment which describes how effectively an ecosystem can sustain itself over time. The term sustainable development, in itself, is self contradictory. Sustainable refers to maintaining ecosystems and their ability to provide services to meet human needs, while development implies improving life quality for humans through natural resource depletion (Yigitcanlar, 2009). The most widely used definition of the term was developed by the World Commission on Environment and Development (WCED, 1987) in its report, *Our Common Future*, as being "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." The World Conservation Union (2013) provides an alternative definition. They define sustainable development as living within the carrying capacity of supporting ecological ecosystems, while improving human life.

With sustainable development as a critical theme in this research, due to its supposed capacity for balancing social, economic, and environmental factors, the

effectiveness of the spatial plan will be critiqued against the following criteria, based on Gibson (2006: 41).

Sustainability Criteria:

1. Integrity of social-ecological systems
2. Livelihood sufficiency and opportunity
3. Equity within the current generation
4. Equity between this generation and future generations
5. Efficiency – in use of resources and energy; doing more with less
6. Democracy, good governance – building understanding, capacity, commitment
7. Precaution and adaptation – plan for surprise, learn by doing
8. Immediate and long term integration

Inevitably, conflict will arise between the criteria, in which case the following trade-off guidelines are proposed by Gibson (2006: 41).

Trade-off Rules:

1. Look for maximum net gains
2. Those who propose to trade-off natural capital are responsible for 'proving' their case
3. Avoid all significant negative effects

4. Protect the future (don't displace negative effects to future generations)
5. Provide explicit justification for trade-offs
6. Use an open, transparent process

2.2.2 Human- Nature Relationships in Planning:  
Understanding the Current Tension

The inextricable links between nature and human livelihoods are now described. Gasson (2007), argues that in connecting humans and nature, we can understand human reliance on the natural environment in terms of three basic types of needs: biochemical needs, physical needs and psychological needs (Gasson, 2007). The biochemical need is related to basic human survival in terms of extracting and processing clean water, air and food, while emitting wastes and heat (Gasson, 2007). Through this need, it is clear that nature acts as a vital human life support system, providing the means of life, and a sink to absorb human wastes, after the resources which sustain life have been used. Physical needs of nature refer to land and the need to occupy and adapt it, in terms of making decisions regarding where to settle or not (Gasson, 2007). In this way, human-nature relationships are understood in terms of available resources and potential hazards. The final basic type of need, human's psychological needs of nature, refers to the ways in which humans are connected to nature through orientation and

identity (Gasson, 2007). Through the five senses of sight, touch, sound, smell and hearing, a sense of place is created by humans within nature, which is necessary for human psychological wellbeing (Gasson, 2007). Gasson's three basic human needs of nature provide a clear understanding that human survival is fundamentally dependent on the natural environment and its ability to provide for human needs.

However, following the industrial revolution, humans have come to be removed from these basic needs of nature as clean water, air and food sources have been polluted by large industrial activity; land was over grazed, farmed and developed through the physical needs of humans to occupy space; and the sense of identity and place within nature was degraded through growing urban landscapes (Gasson, 2007). This pattern has continued today where the basic needs which humans have of nature have been exploited in order to increase economic development. According to Acosta (2010), nature has limits and the exponential usage and exploitation thereof, in the quest for a constructed form of progress or development indicator, has no future.

The negative effects of large industrial development on nature's finite limits, and the subsequent effects on nature's ability to provide for the basic needs of human society are not a recent realisation, as conservation and living with

nature has been a debated topic within the planning discourse since the 1930s. Gasson's argument (2007), which assumes that nature is something separate to humans, and which implies human usage as nature's main purpose, is problematic. Early authors, such as Geddes, argue that understanding human survival is dependent on the realisation that humans are part of the environment and their very survival is dependent on it (Geddes, 1915). However, since then, there seems to be widespread consensus in the academic literature that ecocentric views of human-nature relations, which were being realized in the early 1900s, were diminished by rapid industrialization and faith in a neoliberal economy (Brockington & Duffy, 2010).

Acosta (2010) writes about how world-wide materialism has resulted in a situation whereby the accumulation of material goods, drawn from nature's resources, is commonly viewed as society "making progress." This capitalistic worldview, which has dominated development values and agendas for decades, has seen the domination of society over nature through ideologies, science, and techniques which have brutally separated humans and nature and has turned nature into a commodity and seemingly inexhaustible resource. Additionally, according to Acosta (2010), the Brundtland Commission of 1987 recognized that society cannot continue down this unsustainable path.

This presents a chilling paradox: the fact that the capitalist system is destroying its own biophysical conditions for existence. In this sense, the link between environmental degradation as a result of human behaviour is inextricable. This link is clear, yet little has been done to rectify the situation (Klein, 2014). In her book *This Changes Everything* (2014), Klein refers to this as cognitive dissonance, meaning that two conflicting views can be held simultaneously. The conflict in this scenario is economic growth and consumerist behaviour, versus the survival of the natural environment and subsequently humans. In order to address this cognitive dissonance, critical changes in the perception of nature and the aspirations of the need to achieve a good life must coincide with one another. Furthermore, Rondinelli (1983) argues that in order to accommodate the future needs and numbers on earth's natural capacities, a transformation of human values, social institutions, and economic structures is necessary on a similar scale to the agricultural and industrial revolutions.

This calls into question the idea of the "good life" and asks the question "better for who?" The notion of what constitutes the good life is not new by any means. The good life, as argued by Aristotle, was enabled by the state, which among other things, allowed for the accumulation of wealth in order to satisfy a person's natural wants (Jowett, 1943). However, Jowett (1943: 67) states that this accumulation of wealth should have its limits as

unbounded accumulation would result in "living only," not necessarily "living well." Today, the aspirations of the good life seem to be more closely aligned with Aristotle's definition of "living well" (Pulker, 2016). The current consumerist driven economy, in order to achieve high levels of perceived development and growth, has relied on the use of nature as a seemingly infinite source of resources (Cullinan, 2010). Furthermore, according to Pulker (2016), the modern anthropocentric aspirations of the good life have separated humans from their basic needs of nature, in order to pursue socially constructed wealth indicators, which are often viewed as being more desirable and synonymous with human growth and development.

Early environmentalist understandings of human-nature relationships, premised on separation, tend to make the exploitation of natural resources easier to compartmentalize (Nixon, 2011). This approach allows the problem to be seen as more distant from us as humanity, and in turn has not necessarily placed it as of foremost importance in issues of planning, as cited by Nixon (2011). Charles Eisenstein's (2011) book *Sacred Economics* provides a deeper look into what is actually causing the seemingly ever-increasing disconnection of humans from nature through the continued emphasis on growth and accumulation. Eisenstein (2011) argues that our disconnection from the natural world began with the process of rapid urbanization, and the corresponding

commodification of natural resources. In other words, things once freely available to people were taken away then sold back (Eisenstein, 2011: 94). He then argues that this has led to widespread feelings of loneliness which in turn leads to consumerism as an attempt to fill the void (Eisenstein, 2011: 44).

The role of nature in planning and management theory and discourse, post-industrialization, was as a natural 'resource' which needed to be managed (Holling & Meffe, 1996). Within the history of nature conservation, many theorists have taken anthropocentric approaches to conservation, meaning that nature is conserved purely for human needs and continued human development (Brockington & Duffy, 2010). The current discourse around climate change mitigation and adaptation and humans, is that large capitalist industries run by humans have contributed significantly, if not entirely, to the climate change crisis (Klein, 2014).

### 2.3 Human-Nature Relationships: The Need for a Paradigm Shift

Having highlighted and described the concepts of sustainability, sustainability, and the role of nature in providing human needs as a point of departure, this literature review continues with an exploration of various

theoretical paradigms with regards to human-nature relationships.

#### 2.3.1 The Anthropocene

Nixon (2014) suggests that we have entered into a new paradigm which has overtaken the Quaternary Period known as the Holocene. He calls this paradigm the "Anthropocene" which sees humans and their processes and ways of life as geological actors whose impacts are being written into the fossil record. This geological epoch acknowledges that humans are leaving behind a negative footprint which has the potential to alter the carbon cycle. This paradigm has been widely accepted as legitimate across a wide variety of disciplines. The effects of the anthropocentric alterations of the natural world and its cycles are evident in the ways in which the climate of the world is changing. The impacts of human activities on natural systems is best described in figure 1. It describes how human activities impact on the local environment and the global environment. According to Yigitcanlar and Dizdaroglu (2015) human activities have significant impacts in that they disrupt natural gas and nutrient cycles and fragment the landscape. Population increases have increased the demand for land, which has subsequently seen a loss in vegetation and biodiversity through urban development which has altered the soil fertility and water quality through waste dispensed from agricultural and industrial activities and polluted runoff from impervious

surfaces (known as the heat island effect where impervious surfaces lead to higher temperatures and poor water quality). Furthermore, water and air quality are altered significantly from energy production, vehicular traffic, and industrial activities.

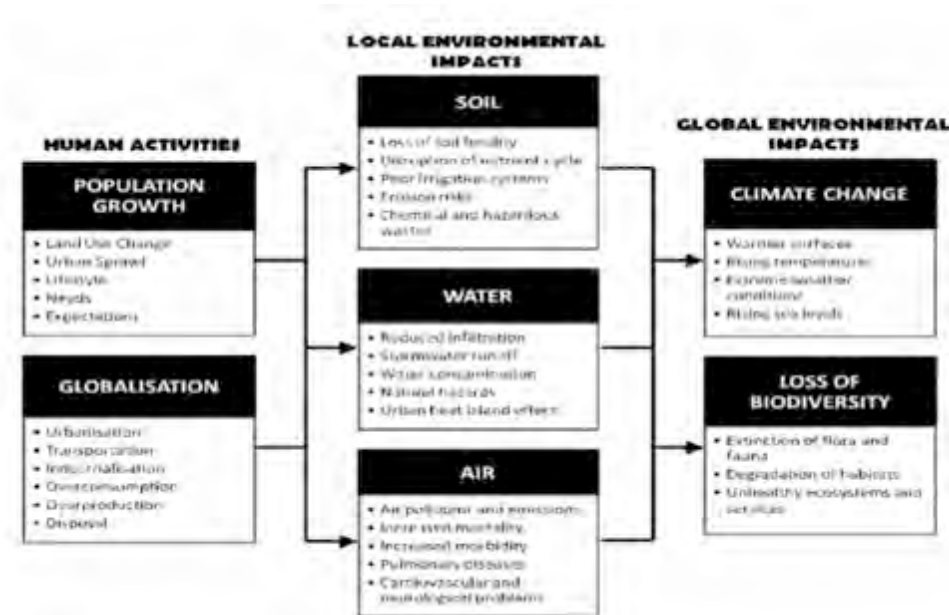


Figure 1: The impacts of Human Activities on Natural Systems (Source: Yigitcanlar and Dizdaroglu, 2015)

“Climate change is affecting the general acidity of the ocean, sea levels, the biosphere (the living creatures), and extending to the earth’s crust (lithosphere). As such, human-induced climate change is entwined with every

natural process on the planet” (Hamilton, 2014: 2). However, the effects of the Anthropocene do not only manifest through extreme weather events. Nixon (2011) discusses the invisible effects of climate change and calls these ‘slow violence’ (Nixon, 2011:2). This slow violence occurs in the form of food insecurity, polluted water sources and land, as well as areas vulnerable to hazardous weather conditions (Cock, 2016). In a sense, slow violence refers to the effects of climate change, due to anthropocentric forces, which are outside of everyday sight. It is these effects which are more dangerous to humans because they are seemingly distant from human livelihoods in the city. However, this is not the case.

### 2.3.2 Shifting Paradigms

The need for a paradigm shift in conducting human relationships with nature has been made starkly apparent. Gladwin, Kennelly, and Krause (1995) offer an explanation as to how this shift may be enabled and where a sustainable future might lie in amongst polarized worldviews and paradigms. Gladwin et al. (1995) argue that a fractured epistemology dominates this realm of thinking and outline and reject two competing paradigms in favor of a sustaincentric worldview as a possible means of achieving sustainability. They examine

three worldviews which give shape and meaning to the world: Technocentrism, ecocentrism, and sustaincentrism.

The technocentric paradigm is biased towards human domination over nature. It sees the world as inert and passive, and therefore legitimately exploitable and argues that humankind is separate from and superior to nature. Technocentrism thinks nature is resilient in the face of disturbance and there is therefore no cause for alarm or action as the economy is separate from nature. An analysis of this worldview against the criteria for sustainability renders this paradigm poor and inefficient.

The polar opposite paradigm, ecocentrism, sees the earth as the nurturing mother of life which is alive in itself, active, sacred, and sensitive to human action. It rejects the view that humans occupy a privileged place in nature and sees nature as vulnerable and fragile and on a collision course with humanity, which is seen as secondary to the well-being of the earth. Again, this worldview fails to satisfy the criteria of sustainability holistically.

A third paradigm, sustaincentrism, draws its inspiration from claims of the universalism of life and aims to balance the previous two paradigms in a way which offers a basis on which sustainability can be achieved. It argues that the earth is humanity's home, to be kept clean and healthy and managed for the sake of human welfare and survival.

It rejects the monism of the previous two paradigms in favor of a moral plurism which seeks to reconcile the two polar extremes in acknowledging the intricate web which seeks to understand, evaluate, and provide options for the best use of nature and its resources in a best-fit situation with human processes through an ecologically sensitive lense (Ndubisi, 2002). It is my belief that humanity needs to move towards a more balanced and holistic sustaincentric view of the relationship between humans and nature. Changing mindsets is by no means an easy task. Acosta contends that throughout history, we have seen resistance towards the broadening of rights for many groups of people, such as for women and black people (Acosta, 2010: 7). Despite this, it remains inevitable that change in terms of the conception of the natural world will occur. In the current zeitgeist however, such widespread changes need to occur rapidly if humanity, and the poor in particular, are to survive the current anthropocene. The role of planning in enabling this change is therefore brought to the forefront. Furthermore, the values of planners are also highlighted. Spatial planning, ecological planning, and their integration, in line with this paradigm shift, are discussed below.

## 2.4 Spatial Planning And Its Role As A Facilitator Of Integration

Spatial planning is broadly defined by Woltier and Als

(2007:1) as “the practices that influences the distribution of activities in space.” In the past, spatial planning was a top-down practice, which was considered the sole responsibility of government and their city planning and development departments (Cameron, 2014). However, the onset of democracy and the subsequent strengthening of civil society capacity have seen the involvement of a broader range of stakeholders in a more comprehensive approach to the planning process (Cameron, 2014). The practice, therefore, brings together a range of stakeholders and interests at a number of scales in order to plan for, design, and shape the built environment, or more broadly the world we live in. In this way, spatial planning, as an ongoing process, aims to transform space and landscapes to enable the development of human processes and livelihoods.

In the past, planning was mostly concerned with land use as a framework for economic development. While land-use planning has always acknowledged care for the environment, meanings, representations and status of environmental issues as compared to development priorities have fluctuated over time (Davoudi et al., 1996). The 1990s/2000s saw a shift in planning from land use regulation to spatial planning. Although spatial planning is also concerned with land use regulations, it is also layered with complexity. This is because it must, among other things, respond to conflict resolution, ease tensions, and

settle contradictions among sector-based policies and practices (UN, 2008). This is especially important in urban areas, in integrating the various stakeholder visions, processes, and demands on ever increasingly scarce land resources. Carter (2007: 331) argues that land should be a means “to encourage social progress and welfare through, for example, providing housing or services such as schools and hospitals; to promote economic growth, such as industrial estates and transport infrastructure; and to provide space for the natural environment for reasons including biodiversity conservation and the maintenance of natural floodplains”.

The above quote highlights the various agendas and mandates to which Spatial Planning must respond, balance, and integrate in order to develop comprehensive and holistic visions for sustainable urban development futures. As such, the United Nations (2008: vii) defines spatial planning as “a key instrument for establishing long-term, sustainable frameworks for social, territorial and economic development both within and between countries. Its primary role is to enhance the integration between sectors such as housing, transport, energy and industry and to improve national and local systems of urban and rural development, also taking into account environmental consideration”.

The mandate for spatial planning to integrate human processes for improved socio-economic wellbeing with

natural processes for environmental sustainability and ecological sensitivity is clear. Therefore, playing the role as custodian over the natural world, which supports life, planning should holistically integrate environmental, social, and economic processes together with institutional, budgetary, and political considerations. In doing so, the role of spatial planning is to develop spatial plans and policies across a diverse sphere of processes and power hierarchies, which influence and play out in space. These plans are developed for the purpose of enriching human livelihoods in the urban context through policies, which include, but are not limited to, energy, transport, the environment, economics, social facilities, water, and tourism (Carter, 2007). As such, spatial planning is ideally positioned to enable and foster more integrated human-nature relationships in the city through incorporation and representation of ecological and environmental planning within spatial plans. It has become evident that spatial planning is essential for developing the frameworks, which integrate human and ecological processes in space through effective land-use and design guidelines, policies, and plans. According to Albrechts et al. (2003), spatial planning is concerned with developing strategies, which articulate a unique vision for an area to guide public and private investment for future development planning.

The complexities of drawing on and balancing a wide range of inputs, agendas and stakeholder interests to

develop comprehensive spatial plans and policies are ultimately what shape the built environment and the way in which it is integrated with natural processes, which are essential to its survival. As well as planning for sustainable urban development, Woltier and Als (2007) argue that environmental and ecological planning is also an integral part of spatial planning. Furthermore, they suggest that spatial planning should coordinate climate change mitigation and adaptation efforts, especially in the current context, where the effects of cities on the natural environment and subsequent effects on climate change, are at the forefront of the discourse.

## 2.5 Spatial Planning in South Africa

As a tool to shape our cities and enable sustainable urban futures, spatial planning is especially relevant in the South African context. Spatial planning, in the past, was used as a tool to implement Apartheid's spatial policies around racial, social, and economic segregation on a national and city scale. As a result of South Africa's spatially fragmented past, the ways in which its cities are structured today still echo historical segregation. The effects of Apartheid on spatial structure in South Africa is still evident today, highlighted by the fact that South African cities are among the most unequally distributed cities in the world. Urban development is still governed by many of the principles which existed in South Africa's Apartheid past

and persist into the current time. As such, spatial planning is key to redressing past imbalances and spatial injustices around fragmentation and segregation to enable equitable and sustainable future urban growth and development. This is so because spatial planning was the very tool which was used to enforce the fragmentation and spatial inequalities in South Africa in the first place. According to the United Nations (2008), it must be noted that spatial planning is incapable, on its own, of bringing about community improvement. Instead, it is recognized that the inclusion of all stakeholders in a process, combined with a sound framework for future development have the potential to bring about meaningful urban change.

The outcomes of spatial planning are concerned with the mediation of land uses, based on a framework for integrating multiple concerns, agendas, analyses, and data sources. Both human and environmental sustainability is dependent on effective land use decisions, which should aim to enhance both human and ecological processes. According to Carter (2007:5), "changes in land use are linked to environmental change through a multiplicity of direct, indirect, sometimes cumulative and often uncertain effects." Carter eludes to the fact that since spatial planning relates to humans as part of nature and linked to natural environments, and is concerned with shaping space, it has the potential to influence the relationship between humans and nature and enable socio-

environmental integration in the urban context. This occurs through the potential to influence the types and locations of urban developments to ensure effective and proactive impact mitigation in the planning stage, in line with no net loss to environmental processes. Working across scales and sectors, conflicts can be resolved between ecological and urban development through the inclusion of a range of relevant stakeholders in the planning process (Carter, 2007). In this way, spatial planning uses knowledge from a diverse range of sources and analyses to inform applicable actions.

## 2.6 Role of the Planner

This section has highlighted the essential role of spatial planning in enabling more sustainable futures for urban areas within cities. The role of the planner, therefore, is not to control the complex processes involved in urban and ecological planning and development, but rather to effectively mediate the equitable and sustainable transition to new paradigms, discussed previously, which seek to integrate humans and nature. The role of the planner as a mediator is highlighted by the fact that conflict may arise throughout the planning process, and a range of stakeholders with varying agendas need to be considered and integrated.

The planner plays a vital part in acting upon and engaging with the mandate for planning to respond to both socio-economic development challenges and ecological and environmental considerations holistically, as part of a single system. The planner plays the role of a mediator and intermediary, bringing together a range of interests and knowledge inputs to develop strategic plans for the transformation of space. This dissertation recommends that the role of the planner in developing plans and policies, should be to enable urban development through an integrated socio-ecological lens to redress past injustices and manage the transition to a more sustainable urban future, where human development and nature are closely linked. The ways in which this could be achieved lie in the integration of spatial and ecological planning, as discussed below. According to Cameron (2014: 39), "planning should continue to make similar recommendations for education, policy, and legislation vigorously in order to successfully respond to the urgent crisis which requires better and more efficient resource use and negotiation of the relationships between human society, the ways in which we live, and nature as our ecological base, an agenda which should be prioritized over economic development to ensure the survival of human existence."

## 2.7 Integrating Ecological Planning with Spatial Planning

As stated by Steiner, (2000), planning is "a process that uses scientific and technical information to build consensus among a group of choices". Ecology is the study of interaction between living organisms and their environments. Ecological planning is thus defined as the use of biophysical and socio-cultural information derived from this interaction as decision-making opportunities and constraints in the management of ecological systems. Ecological planning is a broad concept based on strategies and methods to create green, safe, vibrant and healthy urban environments (Roseland, 1997). It is an important planning tool in the establishment of sustainable cities. As stated by Ndubisi, (2002), "ecological planning is more than a tool: it is a way of mediating the dialogue between human actions and natural processes based on the knowledge of the reciprocal relationship between people and the land. It is a view of the world, a process and a domain of professional practice and research within the profession of planning". According to Shu-Yang et al., (2004), the key characteristics of ecological planning can be summarised as below:

- *Meeting the inherent needs of human beings:*  
Ecological planning is an essential tool for enhancing the sustainability of human enterprise through finding

environmentally friendly ways of manufacturing goods, constructing buildings and planning recycling- orientated enterprises to reduce ecological damage as much as possible.

- *Moving towards resource sustainability:* Ecological planning promotes the urban form that requires minimum energy and resource input as well as minimises waste generation and ecological damage through efficient use, re-use and recycling.
- *Maintaining ecological integrity:* Ecological planning integrates human activities with the dynamics of natural flows and cycles of materials and energy by developing solutions to particular planning issues. This can be achieved through defining the carrying capacity of ecosystems for the proposed human activities.
- *Emulating natural ecosystems:* Another goal of ecological planning is to emulate natural ecosystems when planning for anthropogenic activities, so that the resulting effects will be relatively 'natural'. For instance, this can be achieved through developing a symbiotic industrial system that refers to an integrated process in which the waste of one process becomes a resource for another.

Ecological planning, as discussed above, offers an opportunity to shape the built environment around us in a way which is more sustainable. It also offers a more holistic

and ecological way of seeing the world and organizing spatial planning. According to Yigitcanlar and Dizdaroglu (2015), in order to achieve a sustainable urban environment, regulation of natural systems and the scale of human development activities is necessary. It is, therefore, essential that spatial planning be based on the information which ecological planning can offer, in terms of the interplay between human development and the natural environment. This highlights the need for better integration between spatial and ecological planning in achieving holistic and integrated development in urban areas. In this way, ecological planning is a fundamental approach to efficient natural resource use while adopting human activities which are less harmful, or not harmful at all, to the environment (Clini, Musu, & Gullino, 2008).

Yigitcanlar and Dizdaroglu (2015) investigate the ecological approaches to planning for a sustainable city, as well as the environmental effects of the interaction between nature and human activities. They argue that for sustainable urban development to become a reality, ecological planning has a significant role in strategic spatial planning. Below is a table (Table 1) from Scott, Collier, Foley and Lennon (2013), which traces the evolution of and compares the differences between different historical planning types -from land use, to spatial, to ecological planning.

Defining Attributes	Land use planning	Spatial planning	An ecological turn in spatial planning
<i>Purpose</i>	Planning for the 'public interest'	Planning for 'sustainable development'	Planning for 'resilient' places
<i>Aims</i>	Providing a land use framework to facilitate economic development	Ensuring the competitiveness of city regions within a globalised economy	Working with natural processes to enhance ecosystems services provision
<i>Approach</i>	Land use regulation	Spatial coordination	Social-ecological integration
<i>Scope</i>	Narrow and defined spatial and functional boundaries	Broad and 'fuzzy' spatial and functional boundaries	Inclusive and overlapping spatial and functional boundaries with particular attention to biogeographical delineations
<i>Logic</i>	Static	Flexible	Reflexive, adaptive and transformative
<i>Administration</i>	Functional silos	Increased communication and cooperation	Full integration
<i>Urban Perspectives</i>	Defined land uses	The compact city and urban renaissance	Landscape urbanism and ecological urbanism
<i>Rural Perspectives</i>	Separation of 'town and country'. Rural as inherently different.	Rural as supporting element to city region.	Rural as equal element in social-ecological continuum.
<i>Landscape Perspectives</i>	"Islands" of protection: landscape as ornament and site-based approach to protecting habitats and species	'Landscape as marketable asset': natural heritage as development assets	'Multifunctional landscapes': Protecting, enhancing, restoring and creating new ecological networks – "connectivity"
<i>Emblematic policy approaches</i>	Areas of Outstanding Natural Beauty; Green Belts; Land Use Zoning	Quality of life capital; landscape character assessments	Green infrastructure hubs, parcels, individual elements, corridors and land-use buffers
<i>Design Concepts</i>	Domination of nature. Intensive civil and mechanical engineering of solutions.	Management and manipulation of nature. Engineering solutions predominate, but less intensive methods accepted.	Biomimicry and less intensive methods favoured. Working with nature.

Table 1: Differences Between Different Historical Types (Source: Yigitcanlar and Dizdaroglu, 2015)

According to Yigitcanlar and Dizdaroglu (2015) in many parts of the world, new or existing developments have moved towards a more ecological approach to development planning. As presented in Appendix 3, many cities develop integrated solutions to the major environmental challenges of today and transform into sustainable and self-sufficient communities. These cities provide multi-dimensional precedent for effective ecological planning. Ecological planning has offered a sustainable approach to the management of natural resources through preserving biodiversity and ecosystem productivity.

## 2.8 Sustainable Development For the Future

In recent decades, many cities, acknowledging the fact that nature is a vital part of cities, have adopted sustainable development policies into their urban plans. Appendix 4 provides a brief summary of best practice sustainability models in cities, at a range of spatial scales. However, it is worthy to note that most of these best practice examples are on a city or global scale, with little consideration for the local scale, where urban development and nature come face to face.

For a sustainable built environment, it is necessary to regulate the processes of nature and control the scale of human activities through integration of environmental processes in strategic spatial planning. According to Yigitcanlar and Dizdaroglu (2015), this integration brings a holistic understanding of the physical characteristics or urban development as being part of a system with the natural environment and its potential, risks, and limitations in the planning process. "In this respect, ecological planning is a fundamental approach to the sparing and efficient use of natural resources while adopting human activities in a less harmful way to the environment" (Clini et al., 2008, as cited in Yigitcanlar and Dizdaroglu, 2015: 164).

### 2.8.1 Sustainability and Poverty

Adams, Aveling, Brockington, Dickson, Elliott, Hutton, Roe, Vira, and Wolmer (2004) argue that threats to biodiversity and natural resources are often combated by the creation of protected areas which foreclose future land uses and have negative effects on poverty and the poor, through evictions, who may benefit from living on this land. They therefore suggest that the needs of local people need to be considered with great regard for human rights in order to align national poverty alleviation objectives and conservation and sustainability objectives. In order to ensure a sustainable future, poverty and nature cannot be separated as a better understanding of nature and

sustainability objectives offers important opportunities for the betterment of poor livelihoods and the eradication of poverty through sustainable and renewable energy and development initiatives (Adams et al., 2004).

### 2.8.2 Rights of Nature

Acosta (2010) argues that nature should be a subject of rights, with the right to be restored when destroyed. This will ensure plural citizenship in a symbiotic relationship between humans and nature and will free nature from its status as an object to be owned through political encouraging and enabling of ecological and environmental justice. In the international Climate Talks in Paris (2015), the International Rights of Nature Tribunal was established to defend the rights of nature and ensure planetary justice in accordance with the Universal Declaration of Rights of Mother Earth (successful in the Ecuadorian Constitution). This landmark in human history, according to Acosta (2010), enables decision making around issues which negatively impact the environment and gives moral weight to civil movements which demand climate justice for sustainable futures. In order for an approach, such as this, to be successful or even viable in post-colonial countries, planning must find innovative ways to integrate the rights of nature with the rights of humans, which are often still not fully realized and respected.

### 2.8.3 Earth Jurisprudence

Despite the contestation of the promotion of environmental rights over what could be considered to be more pressing social issues, the move towards a comprehensive set of rights for the environment is in many ways a clear sign that nature plays a vital role in the survival of humans and the earth itself. Current government systems facilitate the perpetuation of human domination over nature, allowing for continued degradation of nature's finite systems (Cullinan, 2010). Similarly to how colonial powers rejected the rights of indigenous people and allowing for their oppression, so do current laws reject the rights of other non-human inhabitants (Cullinan, 2010). The idea of Earth Jurisprudence as discussed by Cullinan (2010), establishes the earth as a whole community which allows for the creation of ecocentric or earth-centric systems of governance. However, the word ecocentric, in this context, is slightly problematic. This is due to the fact that this dissertation argues for a sustaincentric approach to development which is not polarized and which integrates ecocentric and anthropocentric paradigms. As such, it means that earth jurisprudence allows space for sustaincentric systems of governance which are people and environment centered.

### 2.8.4 Technology and Innovation

UNEP (2011) offers a positive prospect in the realm of technology and innovation. They suggest that technological processes have the potential to deliver better and increased services which use less energy, minerals and water in order to reconcile the relationships between human society and nature. They favor policies and market signals which allow the transition to green low-resource-use economic models which they argue are financially viable and offer innovative solutions for an increased future potential for human survival and poverty alleviation. Additionally, a lecture given by Sue Parnell (2016) highlighted the fact that in order to achieve a more sustainable future for cities around the globe, innovation is the key in reexamining the interplay between the different facets of urban life. Innovation, in her view, is the solution to discovering new ways of living and interacting with economic, social, and environmental processes. The old and unsustainable models of development are known to be insufficient to achieve the Sustainable Development Goals (SDGs), and as such, new modes of development, enabled through spatial planning and design, are essential to the innovative realisation of a brighter future.

### 2.8.5 Indigenous Knowledge and Spirituality

Anderson (2005) suggests the legitimization of indigenous and local knowledge of people who live closely on and with the land and the importance of their conservation

efforts. Understanding this knowledge, he argues, can help in the creation of national policies as it is far more sophisticated than originally thought to be in the past and offers opportunities for job creation and the establishment of new institutions around capturing this knowledge for inclusion in resource management plans. Furthermore, Anhorn (2006) argues for the inclusion of religious and spiritual knowledge of land and its natural processes and resources in planning.

## 2.9 Planning Approach Recommendations for the Future

This section seeks to draw on the theoretical paradigms discussed previously in order to make suggestions for as to how ecological planning and development planning can be better integrated to enable closer human-nature relationships.

### 2.9.1 Planning for More Meaningful Human-Nature Connections

Cronon provides us with an important reminder of our inherent interconnectedness with nature. He argues: “nature is all around us if only we have the eyes to see it” (Cronon, 1995: 16). Further, if we as humans think that we have the ability to bring about an end to nature, then we are misguided as it means that we simply forgotten that we

are a part of it: “wilderness dwells everywhere within us and around us” (Cronon, 1996: 19). An end to nature would, therefore, mean an end to humans. The two are inherently connected and cannot be separated from each other.

Alberto Acosta (2010) contends that if we want the resilience and absorption capacity of the earth not to breakdown completely, natural resources need to stop being considered as mere objects to be used for development policies and economic growth (Acosta, 2010: 1). Acosta argues that a new form of interrelation with the natural world is required:

“This entails having a scientific understanding of Nature and, at the same time, admiration and reverence for it, an attitude of identification with Nature, far from ownership and dominance, and very close to curiosity and love (Acosta, 2010: 2).

For Acosta, this marks a shift to include a biocentric approach within current anthropocentric approaches to development and planning. For this approach to be viable, a paradigm shift, as described in the previous section, is necessary.

### 2.9.2 Transitions Towards Resilience: Planning For Sustainable Urban Ecosystems

The previous section sought to understand how global thinking influences local acting and decision making. Ways in which resilience has been deployed through the notion of transitioning is now explored through more sustainable planning approaches which offer recommendations for the integration of spatial and ecological planning.

### 2.9.3 Integrating Nature into Human Society: The Ecosystem Approach

Acosta (2010) suggests that nature has limits and that mankind cannot, as it has done in the past, be separated from its processes. Therefore, we should accept that humans are part of a community, integrated into an intricate web with nature. We cannot subordinate nature, nor can we separate ourselves from it. Instead, according to Acosta (2010), a new form of interrelation is necessary between us and nature in a way that not only acknowledges our dependency on it for survival, but also in a way which enhances its potential as a resource for present and future generations which is worthy of conservation, protection, and enhancement. Acosta (2010) argues that if we want to preserve the absorption capacity and resilience of nature, we need to see its resources as more than just conditions for economic growth and necessary objects of development processes. This is an important consideration for planners, in developing plans for development processes. It advocates for greater

ecological consideration and approaches within the field of spatial planning. This “ecosystem approach,” according to O’Neill and Scott (2011), has been researched and promoted as a planning tool for biodiversity conservation, climate change mitigation and adaptation, flood alleviation, and cooling urban heat islands. Over the last twenty years, the ecological approach has come to be seen as a major theoretical angle underpinning planning for complex systems to ensure sustainable development in the future (Smith and Maltby, 2003). Advocating for the concept of “ecosystem services,” Granjou et al (2013:10) argue that nature needs to be protected not only for itself, but also for the health, wellbeing, and very existence of human societies. The approach provides a framework for considering entire ecosystems in order to make planning decisions and to value the services which nature provide. Some ecologically-founded planning principles, based on this approach, for sustainable future urban development and enabling a paradigm shift with regards to more integrated human-nature relationships are highlighted below.

### 2.9.4 Ecosystems and Ecosystem Services

The aim of achieving sustainable development is concerned with the creation of cities as “ecosystems, which are ethical, effective (healthy and equitable), zero-waste, self-regulating, resilient, self-renewing, flexible, psychologically-fulfilling and cooperative” (Jennings & Newman, 2008). According to Yigitcanlar and Dizdaroglu (2015), cities should be viewed, managed, and planned with the notion of sustainable urban ecosystems in mind. In this regard, cities need to be considered as ecosystems in order to develop sustainable development policies and programmes.

An ecosystem is a dynamic ecological system that consists of a community of plants, animals and microorganisms living in a particular environment which functionally interact with the non-living environment and humans. They provide a variety of ecosystem services to people, which, according to Rebele (1994) include: provisioning services, regulating services, cultural services, and supporting Services. These four categories of ecosystem services are summarized below in figure 2.

Understanding ecosystem services is an important tool for understanding the relationship between nature and the services it provides for people. This, subsequently, filters into the need to plan for ecosystem services to benefit the natural environment and people in urban areas. Ecosystem

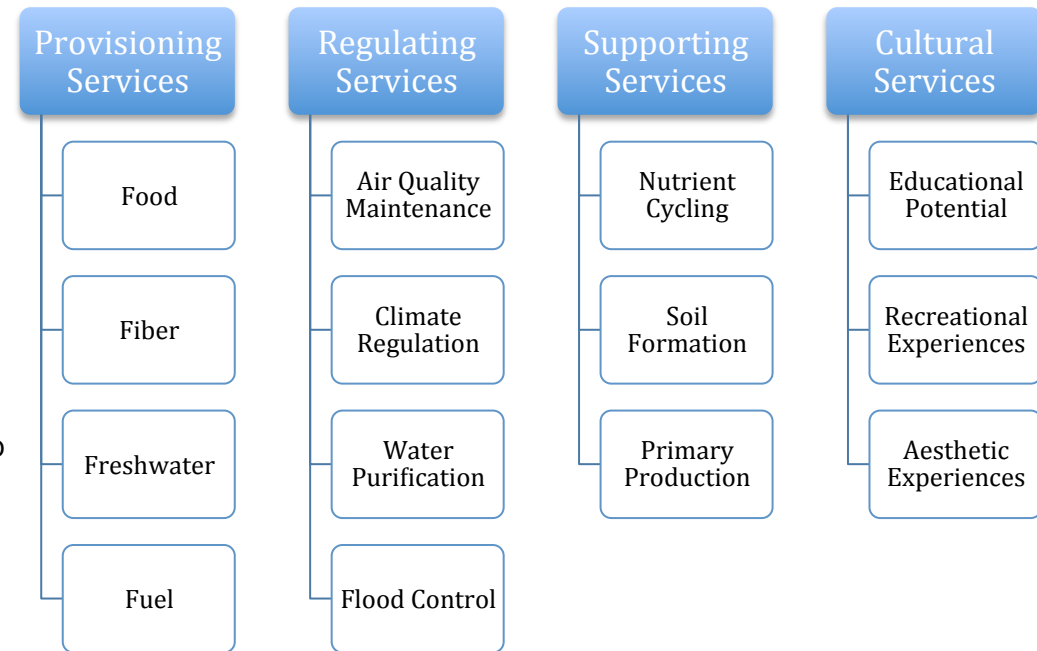


Figure 2: The Four Categories of Ecosystem Services (Source: Author, Adapted from Rebele, 1994)

services are seen as nature-enhancing tools which help to build resilience in socio-ecological systems.

As shown in Figure 3, ecosystems are strongly influenced by the human social system, which is shaped by peoples’ population, psychology and social organisation. Values and knowledge influence how individuals interpret and process the information while translating it into action. Social organisations and institutions specify acceptable behaviours and norms; furthermore, technology defines the possible actions. As a closed loop system, the ecosystem

provides services to the human social system by moving energy, materials and information to meet their needs. In contrast, energy, materials and information resulting from human activities move from the social system to the ecosystem by damaging the ability of the ecosystem to continue providing services for the people (Marten, 2001; Childers et al., 2014).

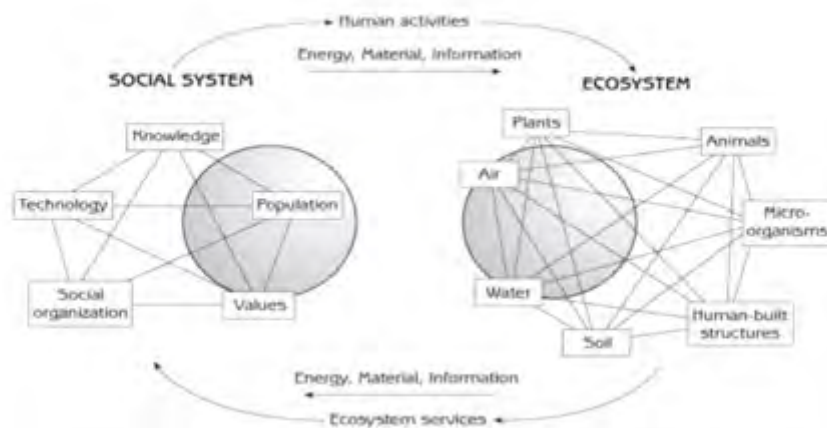


Figure 3: Influence of the Human Social System on Ecosystems (Source: Marten, 2001)

Briefly, the city is a place where nature and artifice meet (Levi-Strauss, 1961), It is a dynamic biological organism that consists of a human population and built- up environment that are highly dependent on nature. In other words, a city is the most dramatic manifestation of human activities on the environment (Ridd, 1995).

According to Slocombe (1993), popular concepts such as sustainable development and sustainability seek the integration of environment and development planning. However, there is little evidence that this integration is occurring in either mainstream development planning or environmental planning. This is a function of the history, philosophies, and evolved roles of both. An ecosystem approach is suggested as being an effective facilitator of planning for the integration of environmental and development initiatives holistically. According to Slocombe (1993), an ecosystem approach to spatial planning integrates a diverse range of knowledge and disciplines and promotes the recognition of people’s place in nature, rather than separate from it. The adoption of a systems approach is therefore necessary.

### 2.9.5 Systems Theory

This dissertation, recognizing that nature is essential for life, holds that the functioning of environmental, economic, and societal systems are all dependent on the fact that nature fundamentally connects and supports each to the other. According to Cameron (2014), these form part of a nested system of life on earth in which society, and thus the economy operate. Figure 4 shows the relationship between economic, socio-political, ecosystem, and governance systems. It shows how each system is dependent on the other, and ultimately the natural

environment. It also shows how the functioning of each system, embedded in the functioning of other systems, is dependent on an inter-system symbiotic relationship which ensures sustainable resource flows and environmental and socio-political sustainability. This model refers to an idealistic way of imagining the interplay between human and natural systems and is known as Systems Theory.



Figure 4: Nested Systems Approach (Source: NSSD1, 2011:1)

Systems theory seeks to engage with a holistic understanding of multiple components in a system, and their inter-related connectedness (Berkes and Folke, 1991). Common in the study of ecosystems in biology, Systems Theory is also applicable to viewing the whole earth, the biotic and the abiotic, including humans, as existing in a web of complex interconnected relationships. In this time of unprecedented uncertainty with regards to climate change and the need to transition towards resilience, Systems Theory brings with it an understanding of the need for great humility and responsibility towards the natural world. As such, our actions should exhibit caution and restraint in terms of impacting on the whole system. This theory, according to Cameron (2014), requires that humans are viewed as intricately intertwined in natural and ecological systems, rather than separate from them.

The understanding of ecosystems as systems is useful to the discipling of planning in understanding the integration of urban and natural environments in cities. It enables an approach to planning which considers the city as an element of a larger ecological system, and implies responsibility on behalf of the planner in planning for development which benefits the entire urban ecosystem.

According to Yigitcanlar and Dizdaroglu (2015:164), a sustainable urban ecosystem can be characterised as an

ecosystem that exists in and around an urban settlement that manages the natural environment by:

- (i) Using natural resources effectively;
- (ii) Producing zero waste through recycling and reusing;
- (iii) Maintaining the ecological functions and processes through self-regulation;
- (iv) Providing resilience against environmental disturbances,
- (v) Flexibility in response to these disturbances (Bolund and Hunhammar, 1999; Berkowitz et al., 2002).

What has become starkly apparent is the fact that urban development and planning has been doing it wrong with regards to striving for sustainability. Unsurprisingly, Swilling and Annecke (2012) argue that the language of “transition” has started to penetrate the sustainability literature. The term is central to systems thinking in terms of how the transition to a more-sustainable order might come about. Transitioning to sustainability requires a fundamental rethinking of development towards a sustainable living epoch, founded on the following values (Swilling and Annecke, 2012): I am because we are, all life is precious, and all actions should be judged by whether they destroy or enhance the greater web of life. It is clear that there is a need to manage urban ecosystems to ensure the sustainable future ecosystem services which nature provide remain in tact. It is also clear that planning for the built

environment and development should include careful consideration of the natural environment, in order to reduce, or ideally prevent negative impacts.

#### 2.9.6 Urban Ecology

Systems Theory, according to Cameron (2014), has led to the concept of Urban Ecology, which views towns, cities, and settlements as being components and processes that exist within an ecological system, within which humans are embedded. According to Alberti (2004: 245), “Urban Ecosystems evolve over time and space as the outcome of dynamic interactions between socio-economic and bio-physical processes operating over multiple scales.” This definition highlights the process of resources to waste and asks us to consider the impacts of our consumption on our very livelihoods. It also acknowledges that the health and well-being of our cities and human activities are dependent on the health and well-being of the broader natural environment system. According to Cameron (2014), this concept binds human processes and systems to the limits of the ecological and environmental systems around them. If these limits are exceeded, the system is seen to be unsustainable and in dire need of change and improvement. Recent research by twenty-eight internationally renowned scientists in 2009 identified and quantified nine planetary boundaries, which, if exceeded, have the potential to result in abrupt and irreversible

environmental changes which would threaten the very existence of humans on earth (Stockholm Resilience Center, 2014). Of these nine identified planetary boundaries, three have already been grossly exceeded, namely biodiversity loss, the nitrogen cycle, and climate change. The other six are edging ever closer to the acceptable limits at a rapid pace. Possible increased demand on these boundaries, due to dominating and unsustainable human developments such as agriculture, industry, and construction, are an increasing threat, especially within the current context of rapid climate change and uncertainty.

Therefore, current development planning should aim to not only decrease the demands on these boundaries, but to avoid creating the demand in the first place. Furthermore, urban planning should ensure intra and inter-generational equity and equality in terms of providing future natural resources in the city. Protecting, restoring, and enhancing the natural environment, through the lens of urban ecology, could achieve this. The need for planning to engage with a more holistic, strategic, and integrated approach to both urban and ecological planning is thus highlighted, to intervene in a world dominated by development and subsequent increasing complexity and uncertainty. According to Aldo Leopold (1949: 203), this way of thinking “changes the role of *Homo sapiens* from conqueror of the land- community to plain member and

*citizen of it. It implies respect for his fellow-members, and also respect for the community as such.”*

### 2.9.7 Sustainable Urban Ecosystem Management and Assessment in Planning

Understanding urban ecosystems and human activities, and their integration, is important in transforming cities into sustainable systems. It is important for planning to develop environmental indicators as frameworks through which urban ecosystem sustainability assessment can occur. This involves setting specific sustainability goals for a community and planning to achieve them, with any spatial plan evaluated against these clearly defined and articulated goals. Appendix 5 provides an overview of international sustainability indicator initiatives. However, Yigitcanlar and Dizdaroglu (2015) critique these indicators for being too broad to offer valuable and practical solutions at a local scale, and argue that no benchmark at this scale currently exists within the discourse of planning for sustainable cities. Thus, there is a need for the development of a local-scale urban ecosystem sustainability assessment method to inform local planning, conservation, and development initiatives. This will enable richer policies at a local level for the integration of ecological planning and sustainability considerations in the spatial planning discourse.

According to Yigitcanlar and Dizdaroglu (2015), sustainable urban ecosystem management is based on a number of principles. These include the provision of a long term city vision, achieving long term economic and social security, protecting and restoring biodiversity and natural ecosystems, providing sustainable production and consumption, building a sense of place around ecology, and enabling cooperative networks. As such, strategic and innovative tools for managing the environment in the planning process must be developed in order to ensure that development has a positive impact on the natural environment, with no assumption of inevitable negative impacts and no net loss. In this way, the mitigation of impacts is not the main concern; development which seeks to have a positive impact on the environment around it is. According to Yigitcanlar and Dizdaroglu (2015), urban ecosystem sustainability assessment is necessary in order to make decisions and integrate ecological concerns into urban spatial planning. The main purpose of this strategic assessment tool is to define a set of sustainability targets before the project begins, improve policies to help make the necessary corrections, and make constant comparisons and evaluations over time and space. This tool for EM&A assumes and ensures that the environment is central to the planning process.

According to King (2007), the question "what contribution will a development make to sustainability goals?" is seldom

asked of a project. However, he argues that we can no longer afford to merely minimise impacts in project proposals, we need to ensure a positive environmental contribution - positives must out-last the project in order to achieve environmental equity and net gain into the future.

#### 2.9.8 Positive Development Through Design

This dissertation recognizes that genuine sustainability requires more than just social change and ecological resoration, and should attempt to increase the amount of ecosystem goods and improve the health and resilience of the natural environment. Birkeland (2008) recognizes that design of the built environment is an important tool to create the infrastructure, conditions, and space for nature to continue to support life and maintain its own processes. She recognizes that development can provide a better quality of life, health, and amenities for all without compromising natural resources. She suggests the concept of "Positive Development" which is a more proactive approach to nature than what we have previously employed which harnesses the potential of the built environment to positively contribute to the expansion of the ecological base. This approach uses innovative and direct physical design solutions (not just incentives) to not only close input-output loops which aim to use waste as a resource, but eliminate waste altogether. According to Birkeland (2008), the rich diversity of urban life simply masks a resource transfer process which:

- Harms human and environmental health
- Destroys our means of survival
- Reduces secure access to food and water
- Reduces public space and natural amenities
- Chains us to the fossil fuel economy
- Transfers wealth from the many to the few
- Generates conflict over land and resources
- Cuts off basic life choices for future generations

Planning literature, according to Yigitcanlar and Dizdaroglu (2015), indicates that careful monitoring and assessment of human impacts on natural ecosystems are critical. There have been numerous applications at various scales. Birkeland (2008) further argues that these negative aspects are not inevitable (as thought by anthropocentric and capitalistic paradigms) and suggests that society needs to reverse (not only mitigate) harmful resource transfers through positive design-based development which:

- Improves human ecological health, resilience, and viability
- Increases natural capital, biodiversity, and ecosystem goods and services
- Increases secure access to food and water
- Enhances urban space for both people and natural processes

- Transforms our infrastructure from fossil fuel-driven to renewably powered
- Helps correct imbalances in power and wealth
- Conserves open space, wilderness, and natural resources
- Increases life quality and substantive life choices for present and future generations

### 2.9.9 Planning for Greener Cities

According to Downton, (2009), the eco-city, or eco-polis, is the next, and perhaps most important step in the evolution of urban environments' sustainability: built to fit its place, in co-operation with nature rather than in conflict; designed for people to live whilst keeping the cycles of atmosphere, water, nutrients and biology in healthy balance; empowering the powerless, getting food to the hungry and shelter to the homeless. One of the founding fathers of landscape Architecture, Frederick Law Olmsted (2013), developed the successful national parks system out of a concern for the preservation of natural beauty and ecological functioning within urban areas. Ebenezer Howard (2010) built on this idea with his Garden City Theory which sought to bring nature back into the city through the use of continuous greenbelts. These ideas provided the inspiration for an ecological approach to city and urban planning which sought to bring the built environment into balance with the natural environment. From these ideas

grew Geddes's theory of Bioregionalism, which according to Bonan (2008), attempts to integrate people, commerce, and land into a regional system based on ecological balance. Ecological planning, as a result of its increasing popularity, began to be noticed as a tool for efficient land use planning for sustainable futures. According to Herrington (2010), Ian McHarg proposed a method for ecologically based land use planning, which sought to link ecological considerations with planning problems and design practices. His method, known as the layer-cake, overlays spatial maps of different land uses to identify ecologically sensitive areas and provide analysis-based strategies. This method gives theoretical legitimacy to the mapping and GIS analysis techniques used in this dissertation.

The evolution of ecological planning approaches to greening cities has been described above. In his book entitled "Rethinking Sustainable Cities," Simon (2016) argues that a city should be accessible, green, and fair above all else. He also argues that urban greening has been present in the planning literature since the 1980s. However, its widespread practice is more recent. It attempts to learn from pre-industrialization societies, which survived for long periods of time because they designed nature in to their living environments and lived in ways which protected its importance. At a local scale, energy and carbon efficient construction and designs should be featured, alongside

future-gearred initiatives, such as multipurpose green infrastructure, urban biodiversity conservation, and climate sensitive design standards (Simon, 2016).

Pinelands, in Cape Town, South Africa is a good example of a green urban expansion at a neighborhood scale, using the principles of the garden city, such as development which enhances the natural environment through net biodiversity gains, energy-positive technologies, zero-carbon usage, and a comprehensive and linked green infrastructure network, which is described below. However, according to Simon (2016) discourses and practices of green urbanism can hardly be considered widespread. There is no definition of green urbanism either.

#### 2.9.10 Green Infrastructure: Principle for Planning

The importance of ecosystem services as worthy of protection for human needs, biodiversity conservation, and climate change adaption has already been established in this literature review. However, Scott, Collier, Foley, and Lennon (2013) explore the potential for delivering ecosystem services through the discipline of spatial planning. This signifies a turn to ecological city planning and theory. Their approach is known as the Green Infrastructure Approach which seeks to guide land use decisions and spatial outcomes through understanding natural systems deeply. This approach is defined as being "the physical environment within and between our cities,

towns and villages. It is a network of multi-functional open spaces, including formal parks, gardens, woodlands, green corridors, waterways, street trees and open countryside. It comprises all environmental resources, and thus a green infrastructure approach also contributes towards sustainable resource management" (Davies, MacFarlane, McGloin & Roe, 2015:2). They (Davies et al., 2015:2) identify five broad sets of interests within Green Infrastructure approach as being:

1. Sustainable resource management – particularly relating to the role of GI in the sustainable management of land and water resources, including production (e.g. energy and food crops), pollution control, climatic amelioration and increased porosity of land cover.
2. Biodiversity – particularly relating to the importance of connectivity of habitats at a variety of landscape scales;
3. Recreation – particularly relating to greenways and the use of non-car routes to address public health and quality of life issues;
4. Landscape – examining resources such as green spaces and corridors from aesthetic, experiential and functional points of view;
5. Regional development and promotion – particularly relating to sustainable communities issues relating to overall environmental quality and quality of life.

The approach "seeks to understand, leverage, and value the different ecological, social, and economic functions provided by natural systems in order to guide more efficient and sustainable land use and development patterns as well as protect ecosystems" (PCSD, 1999, 64). This approach, given growing environmental risks and uncertainties, argues for the embedding of ecosystem approaches within spatial planning and plans. It signifies an "ecological turn in planning" (Scott et al., 2013: 3), a body of theory which has flourished in the last decade. In essence, the GI approach represents "a philosophy or organizational strategy that provides a framework for planning conservation and development" (Benedict and McMahon, 2006, 15). Green Infrastructure (GI) advocates for ecosystem services enhancement, provided through spatial planning. The benefits of GI on ecosystem services are described by Scott et al. (2013) in Appendix 6. As such, ecosystem approaches are mobilized through GI provision and planning.

PRINCIPLES	PROCEDURES			PRACTICE EXAMPLES
	BACKGROUND REQUIREMENTS	SPATIAL STRATEGIES	SUMMARY OF SPATIAL STRATEGY	
CONNECTIVITY (SPATIAL, SCALAR, INSTITUTIONAL)  MULTIFUNCTIONALITY  CONTEXT SENSITIVITY  COLLABORATION  PRIORITIZE GI	INTEGRATION (FUNCTIONAL, SPATIAL, SCALAR, INSTITUTIONAL)	PROTECTIVE	TAKING PREVENTATIVE MEASURES TO PRESERVE GI ASSETS AND FUNCTIONS BEFORE THEY ARE THREATENED BY EROSION OR CHANGE BY DEVELOPMENT.	<ul style="list-style-type: none"> <li>CREATING NATIONAL PARKS AND NATURE CONSERVATION SITES</li> <li>FLOOD PLAIN DESIGNATION</li> <li>GREENBELT, WEDGE, CORRIDOR DESIGNATION</li> </ul>
		DEFENSIVE	TAKING MEASURES TO DEFEND GI ASSETS AND FUNCTIONS THAT ARE ALREADY SUFFERING ATTRITION FROM DEVELOPMENT PRESSURE.	<ul style="list-style-type: none"> <li>CREATING BUFFER ZONES</li> <li>ENVIRONMENTAL IMPACT MITIGATION</li> <li>FORMULATING GREEN SPACE ACCESS STANDARDS</li> </ul>
	PARTNERSHIPS (INTER-DISCIPLINARY WORKING, END-USER PARTICIPATION)	OFFENSIVE	TAKING REMEDIAL OR RESTORATIVE ACTIONS TO REPAIR OR REPLACE GI ASSETS AND FUNCTIONS.	<ul style="list-style-type: none"> <li>CREATING NEW GI CORES AND CORRIDORS</li> <li>ECOLOGICAL RESTORATION</li> <li>'DAYLIGHTING' CULVERTED WATERCOURSES</li> <li>ENVIRONMENTAL ADAPTATION INITIATIVES</li> <li>ENHANCING AND/OR PROVIDING ACCESS TO EXISTING GREEN SPACES</li> </ul>
		OPPORTUNISTIC	RECOGNIZING THE POTENTIAL FOR COMPARATIVELY NON-CONTRIBUTING LANDSCAPE ELEMENTS TO BE MANAGED OR STRUCTURED DIFFERENTLY TO ENHANCE THE ASSETS AND FUNCTIONS OF A GI NETWORK.	<ul style="list-style-type: none"> <li>BIODIVERSITY ENHANCEMENT INITIATIVES</li> <li>SUSTAINABLE DRAINAGE SCHEMES</li> <li>GREENWAYS PROJECTS</li> <li>URBAN GREENING INITIATIVES</li> <li>INITIATING 'GI PLAN' PRODUCTION</li> </ul>
	PROACTIVITY			

ADAPTED FROM AHERN (1995; 2007)

Table 2: Typology of Spatial Strategies for Green Infrastructure Planning (Source: Ahern, 1995 & 2007)

Focusing on positive synergies, the GI approach moves planning beyond current paradigms of linear thinking, transforming its structures and systems in order to act upon different ways of seeing the world (Scott et al., 2013). To ensure better ecologically sound outcomes in the planning process, the GI approach places ecology, ecosystem services, and environmental considerations in the center (Scott et al., 2013). Rooted in landscape ecology, recreational planning, and human ecology, this relatively new approach to planning is experimental. Table 2 shows a typology of spatial strategies for GI planning, developed by Ahern (1995, 2007).

In this way, GI is concerned with the provision of ecological green spaces, which are continuous and connected, allowing for a web of green spaces throughout the city. These spaces provide the many benefits of integrating nature in the city through urban ecology. In this way, a network of green infrastructure is established as the green lungs of the city, to provide ecosystem services within the built environment. Planning for green infrastructure, as a result, is brought to the forefront of the ecological planning discourse as a means of ensuring the provision of green infrastructure networks through careful decision-making around development objectives and needs. These not only provide valuable ecosystem services, but enhancing environmental quality seeks to raise the profile and value of land around green infrastructure projects. Planning

directives for the placement of future development is thus of vital importance in maintaining green infrastructure networks. According to Simon (2016), line with a holistic planning approach, the idea of green infrastructure and open space systems is broadening to include aquatic systems and spaces. This green-blue agenda provides positive value for planners through its demonstration of urban nutrient cycles.

## 2.10 Theoretical Recommendations for Practical Application

"We have an opportunity over the decade ahead to shift the structure of our economic, environmental, and social systems towards greater energy efficiency, and more responsible use of our natural resources and relevant resource-based knowledge and expertise. Our economic growth over the next decade and beyond cannot be built on the same principles and technologies, the same energy systems and the same transport modes, that we are familiar with today." - South African Finance Minister Trevor Manuel, Budget speech, Parliament February 20th, 2008.

It means, according to Cronon (1996), that deep reflection and respect must accompany each act of use, and means too that we must always consider the possibility of non-use. It means looking at the part of nature we intend to turn toward our own ends and asking whether we can use it

again and again and again- sustainably-without its being diminished in the process. It means never imagining that we can flee into a mythical wilderness to escape history and the obligation to take responsibility for our own actions that history inescapably entails. Most of all, it means practicing remembrance and gratitude, for thanksgiving is the simplest and most basic of ways for us to recollect the nature, the culture, and the history that have come together to make the world as we know it. "If wilderness can stop being just out there and start being also in here, if it can start being as humane as it is natural, then perhaps we can get on with the unending task of struggling to live rightly in the world-not just in the garden, not just in the wilderness, but in the home that encompasses them both." (Cronon, 1996:89).

Furthermore, the development of Environmental Management Frameworks and environmental management plans should aim to be more holistic and encompass the sustainable future recommendations and requirements set out in the role of the planner section of this chapter in order to work towards a more sustainable future in the management and negotiation of the relationships between humans and nature. Such frameworks of the future should aim to accomplish more than environmental management objectives which aim to monitor, measure, manage, and mitigate the negative impacts of development. Instead, according to Birkeland (2008), they

should aim to increase the ecological base of the environment and enhance it, attempting to undo the damage that has already been done, in order to restore environment to the position they were in prior to development.

Millions can be lifted out of poverty without ruining the planet with the help of clean sustainable energy (Practical Action, Power to the People, 2002).

Energy is the golden thread that connects economic growth, increased social equity, and an environment that allows the world to thrive (UN Secretary-General Ban Ki-moon, Sustainable Energy for All Initiative, 2011).

## 2.11 Personal Reflection

My personal approach, as a future planner, is echoed throughout this chapter, through the choice of literature for inclusion in this literature review. Furthermore, it echoes the opinion of Monbiot (2014) who encourages a return to nature. He argues that to be aware of and love nature is to experience a series of griefs for its wounds. He offers hope for the future through a return to the past, when nature was so intrinsically intertwined in society. Our ancestors, through immense skill, had to read the signals of nature as a means of survival. Monbiot (2014) argues that humans today still possess that skill and that tapping into it will restore the enchantments, wonders, and experiences of nature which

we are inherently wired to respond to but which have been fractured from human society through unsustainable development in the past. He recognizes that nature is in us and we are in nature.

## 2.12 Conclusion

Having highlighted the importance of nature in supporting human life and society, and having articulated a number of paradigms and ways of thinking about the relationship between nature and human society, this chapter can be concluded. It is evident that a paradigm shift is necessary in order to ensure sustainable futures for both humans and nature. The role of the planner and planning and recommendations for the future followed a discussion of ways in which the relationship between nature and humans can be better understood and a personal reflection. Recommendations have been made for ways in which sustainability could possibly be enabled in the future, in a way which is ethical and fair to both human society and nature. It has become increasingly evident that the two cannot be separated and that institutions and frameworks in the future need to take more seriously the role of nature if it is to continue sustaining human society.

In a final word of conclusion, my personal worldview considering the management and conduction of the relationships between human society, development, and

nature can best be articulated by the words from a song from Disney's Pocahontas entitled "Colors of the Wind" (quoted below). The song was written for the movie in the context of the land claims made by the Americans for resource consumption and development, at the expense of the indigenous, local, native American Indians who knew and loved the land on which they lived, in a symbiotic relationship with nature. Essentially, it is the cry of an American Indian woman (Pocahontas) in urging the Americans to better understand the land and natural systems of the land which they were attempting to claim.

"You think you own whatever land you land on  
The Earth is just a dead thing you can claim  
But I know every rock and tree and creature  
Has a life, has a spirit, has a name

Come run the hidden pine trails of the forest  
Come taste the sun sweet berries of the Earth  
Come roll in all the riches all around you  
And for once, never wonder what they're worth

The rainstorm and the river are my brothers  
The heron and the otter are my friends  
And we are all connected to each other  
In a circle, in a hoop that never ends

You can own the Earth and still

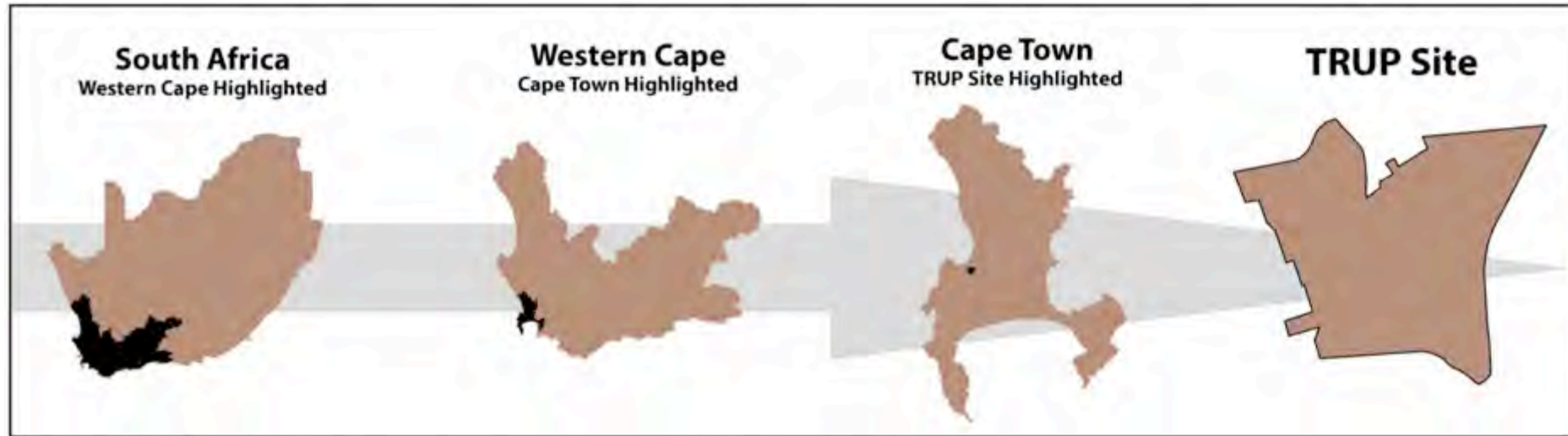
All you'll own is Earth until  
You can paint with all the colors of the wind."

Songwriters: ALAN MENKEN, STEPHEN LAURENCE SCHWARTZ

My personal worldview echoes that of the cry of Pocahontas, in the song lyrics above, and is a personal cry to others to rethink the fundamental societal approaches to nature and our human relationships with it. It urges the reader to engage in a way of thinking which tries to better understand the links between nature and society as one single whole in order to enable more sustainable futures in terms of human relationships with nature.

## Chapter 3: Contextual Analysis

### 3.1. Introduction



## TRUP Site Location in Context

Figure 5: TRUP Site Location in National, Provincial, and Metropolitan Context  
(Source: Author)

Having established a literature review as a theoretical foundation for this research, and identified the role of spatial planning in integrating land use and ecological planning in the previous chapter, this chapter of the dissertation provides a contextual analysis of the TRUP site, as it is embedded at a range of scales. The chapter situates the site within its broader national, provincial, metropolitan,

district, and neighborhood context, before presenting a detailed analysis of the site. The analysis aims to provide a strong contextual understanding of the site and its complex processes as a base for interventions and strategies, which

will

follow in the next chapters. The analysis of the site is undertaken in order to identify opportunities, constraints, and spatial considerations to inform the development of a SDF for the site. The legislative and policy context of the site is also explored, before the chapter is concluded. The analysis aims to understand the complex human and natural processes as a basis for informing meaningful strategies for better integration of ecological planning and spatial planning, and human-nature relationships.

## 3.2 Background Context

In order to understand the site holistically, a background and context is provided below to locate the site through a number of scales.

### 3.2.1 National and Provincial Context

The TRUP site is located in the City of Cape Town Boundary, in the Western Cape of South Africa (Figure 5).

According to City Think Space (CTS) (2012:4), the Western Cape Government, through the Cape Town City Regeneration Program (CTCCRP), aims to:

- Unlock Cape Town's potential to become a city that serves the needs of all its citizens as one of the best cities in the world;
- Leverage private sector investment, capacity and expertise;
- refurbish and achieve savings in the operation and maintenance of its properties; and
- Generate an income stream to finance provincial property development and maintenance.

The programme aims to pioneer a new approach to the development, management, and maintenance of public land to facilitate economic activity, social cohesion, and environmental sustainability. The vision of the CTCCRP is for

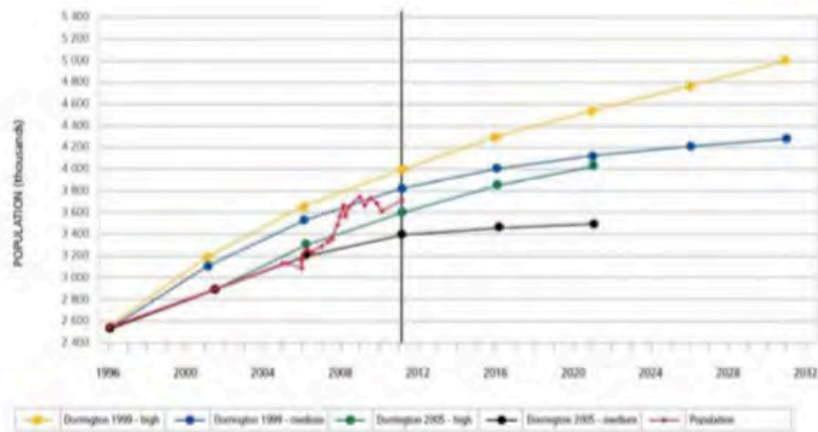
a city which is vibrant, well integrated, diverse, and globally connected, which attracts investment. The programme aims to demonstrate sustainability of green and blue spaces, through waste-to-resource, urban food growing, and natural resource protection processes.

### 3.2.2 Cape town context: Metropolitan Analysis

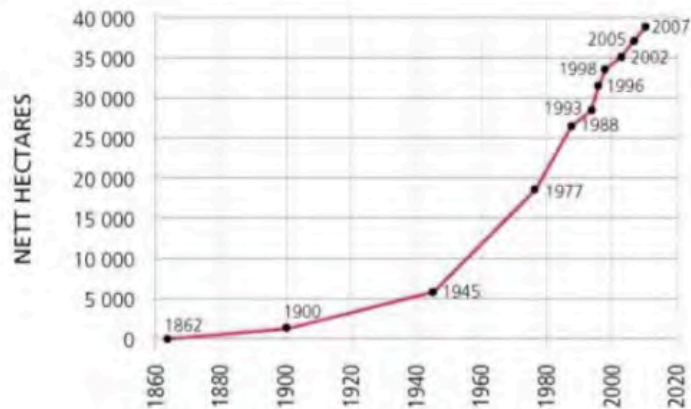
Figure 6 shows the TRUP site in relation to its metropolitan context. The current and future population of Cape Town is shown in Figure 7.



Figure 6: TRUP Site in Metropolitan Context (Source: CTS, 2012)



**Figure 2:** Current population and future population trajectory scenarios  
Source: CTSDf, 2012



**Figure 7:** Current and Future Population Projections for Cape Town (Source: Botha, 2015)

According to the CoCT (2012), it is important that all forward spatial planning initiatives recognise that Cape Town’s natural environment and the uniqueness and amenity that it offers are critical components of the city’s competitive advantage and its service sector-based economy. The protection of the city’s natural environment is therefore not purely a conservation effort, but also a way of ensuring continued investment in the city. This view, however, is problematic, as it anthropocentrically implies that natural assets are to be protected purely for the purpose of human economic gain and profit making.

The CoCT SDF (2012) argues that in order to put Cape Town on a more sustainable growth path, the impacts of urban development on biodiversity and the city’s natural and ecological services must be managed. New urban development should be directed towards locations where its impact on critical biodiversity areas, water bodies and agricultural areas will be minimised. The value of maintaining well-functioning ecological systems must be recognised.

The City must contain Cape Town’s development footprint in order to protect natural, rural and heritage assets with development edges, and promote densification in appropriate locations, in order to encourage more sustainable use of resources, improve economies of scale, and increase thresholds required for public transport. The

development of areas suited for urban development must be facilitated in order to avoid development in hazardous areas.

Based on the analysis of key drivers of growth in Cape Town and their spatial implications, the following are considered to be the spatial structuring elements from which to plan a more sustainable city (CoCT, 2012: 27):

- Adopting an approach to urban growth that promotes a city that is resilient and adaptive;
- Recognising that the City functions within a broader region;
- Protecting natural assets and biological diversity;
- Planning for a multidirectional accessibility grid that facilitates more equitable access to urban economic opportunities;
- Identifying areas of land use intensification that encourage the concentration of economic activities in more accessible locations;
- Putting in place urban growth informants that will manage the city's growth and form in a more sustainable and beneficial way; and
- Protecting and enhancing the city's collection of unique cultural landscapes and recreational assets, which face intense development pressure. These assets include major

tourist destinations and some of the most sought-after environments in the country.

According to the City of Cape Town (CoCT) (2003), there is an urgent need in the city to protect and rehabilitate ecological systems and to encourage mutually beneficial relationships between people and the natural environment. This is recognised as critical to the sustainable development of the city, and hence is a central concern of local government. The area identified as the proposed Two Rivers Urban Park offers an exciting opportunity to address these needs.

Furthermore, the CTSDf (2012) identifies some of the socio-economic issues facing the city of Cape Town. The city, similar to most South African cities, is characterized by widespread unemployment, spatial fragmentation by race and income as a result of past Apartheid policies, large housing backlogs and insufficient access to amenities and services such as housing, health, and safety. Those who are employed travel long distances in order to gain access to economic and social opportunities, making transportation costly and time consuming. Infrastructure, as a result of Apartheid planning, creates hard barriers to access to the city and further fragments it. The city is characterized by inaccessible neighborhood units, as a result, which are separated by natural buffers. Sprawling urban development is the case in Cape Town, putting pressure on food security, water quality, and biodiversity and natural

resources (CoCT, 2012). This increases the use of the car, which is impacting on air quality.

Figure 8 shows the racial distribution of Cape Town. It shows that Cape Town is racially fragmented. The TRUP site lies in an area between different racial groups and offers opportunities for social and racial integration through connecting surrounding neighborhoods.

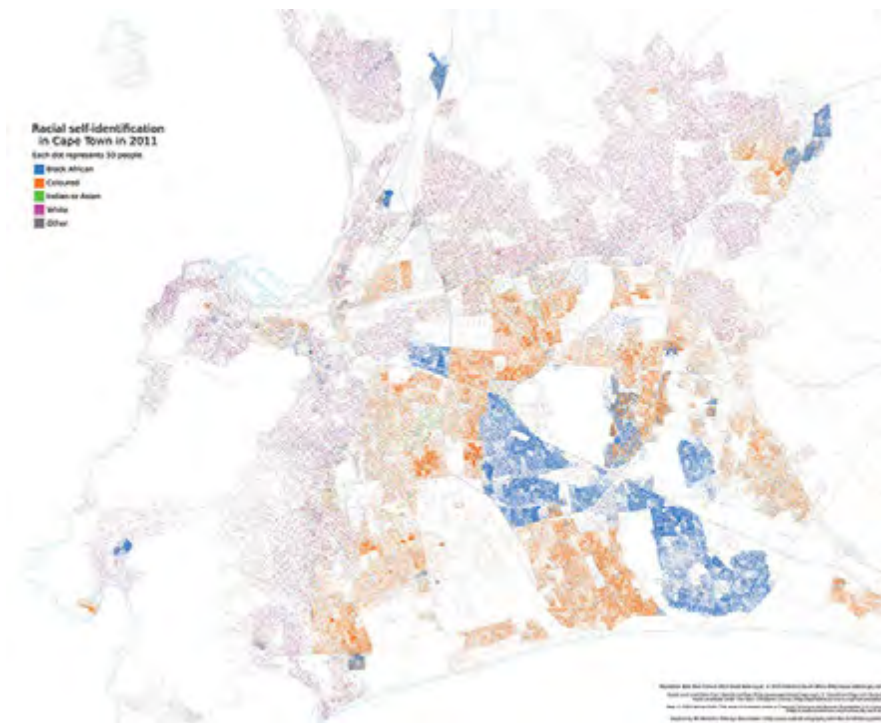


Figure 8: Racial Distribution of Cape Town (Source: Unknown)

Figure 9 shows population densities by area in the city in relation to socio-economic opportunities. It shows that

there is a large disconnect between where people are and where economic opportunities are located. It further represents the spatial fragmentation of the city. In areas where there is the biggest need for socio-economic opportunity, there is less provision. It illustrates the inequality in the city. Figure 10 shows the density of the city. It shows that higher densities are located in predominantly poorer areas, where less economic opportunities are found. The images begin to paint a picture of an unequal and polarized city, in need of integration and justice.

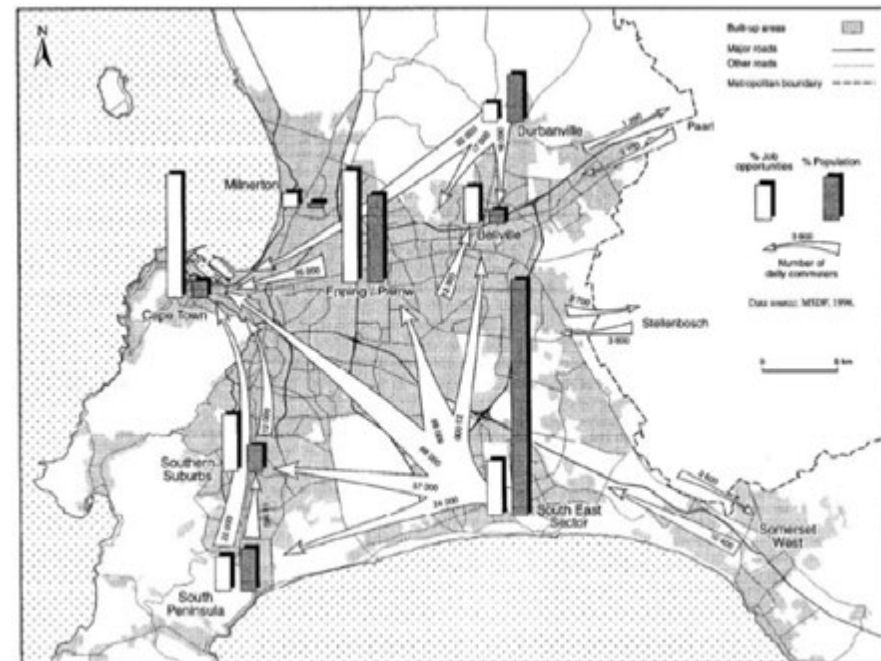


Figure 9: Population densities by Area in Relation to Socio-Economic Opportunities in Cape Town (Source: Botha, 2015)

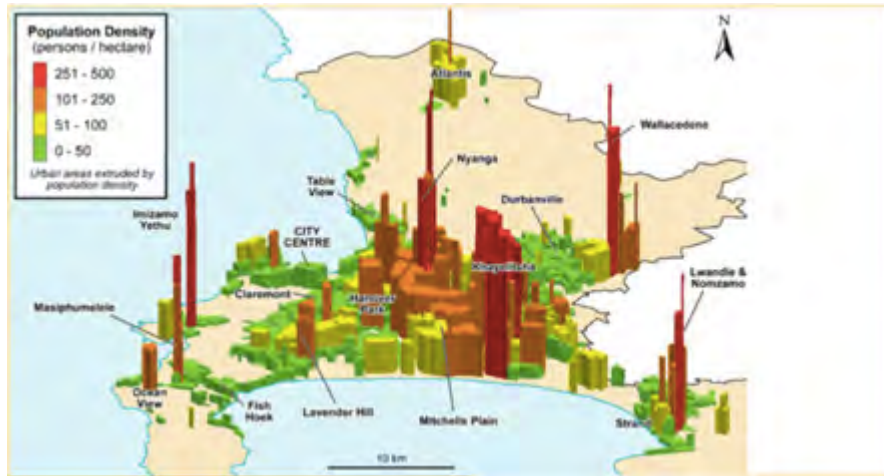


Figure 10: Density of the City of Cape Town (Source: Botha, 2015)

The TRUP local area is located 8km from the Cape Town CBD, at the juncture of two well-established metropolitan activity corridors: Voortrekker Road, Lansdowne Road, and Main Road (shown in figure 11).



Figure 11: Current Metropolitan Activity Corridors in Cape Town (Source: Cameron, 2014)

It has exceptional potential for public transport opportunities, as well as increased access and integration of the metropolitan area. This is so because seven railway stations border the site on its north, east, and west sides, with major transport routes and road infrastructure

bordering and running through the site, such as the N2 In the south, Berkley Road in the north, and the Liesbeek and Black River Parkways which run through it from north to south. The potential for metropolitan integration through the development of the TRUP site is enhanced by the site's location, at the "elbow" of the city. The site links the northern and southern suburbs of Cape Town, as well as the CBD and Atlantic Seaboard. The site is the location of the confluence of the Liesbeek and Black Rivers, which are part of the CoCT system of rivers. The site forms part of a green open space corridor network, linked by the city's riverine systems, which runs through the metropolitan area, and has the potential to become a major public amenity of regional significance (CTS, 2012). Its role, in terms of enhancing and protecting biodiversity and natural resources, is therefore crucial. Biodiversity loss, due to urban development, is rife in Cape Town. Figure 12 illustrates how biodiversity and natural resources in the city of Cape Town have diminished, since the city has grown.

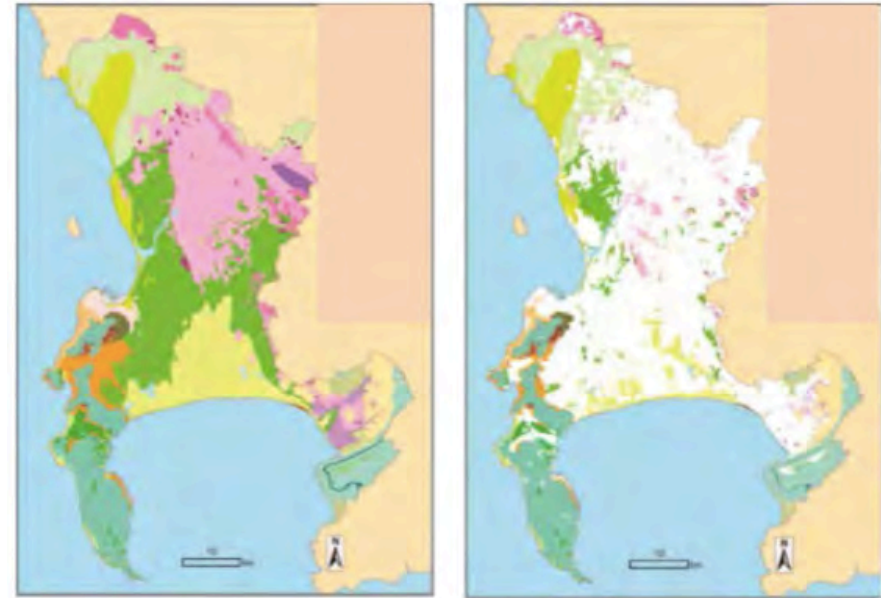


Figure 12: Diminishing Biodiversity and Natural Resources in the City of Cape Town (Source: Cameron, 2014)

### 3.2.3 Site Context: District and Neighborhood Analysis

The TRUP site falls within the boundary of the Table Bay District. The Table Bay district boundary, shown in figure 13, extends from Paarden Eiland at the mouth of the Black River, along the coast towards Llandudno, including the CBD, part of the Table Mountain National Park (managed by South African National Parks (SANParks and a range of other organizations and does not fall under the jurisdiction of the CoCT), and the Atlantic Seaboard, as shown in figure 13:

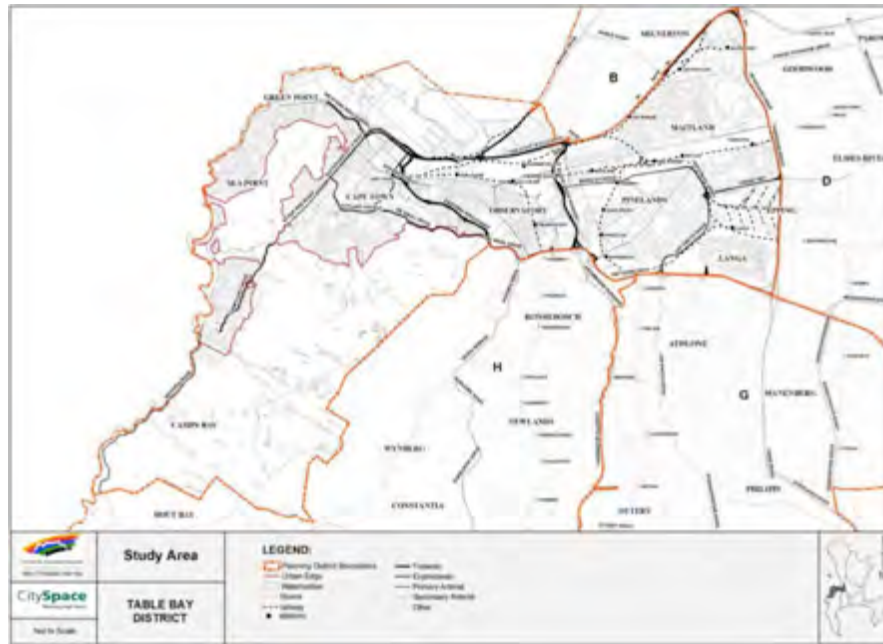


Figure 13: Table Bay District Boundary (Source: TBPDFEMF, 2012)

According to the Table Bay Spatial Development Plan and Environmental Management Framework (TBPDFEMF) (2012), historic Apartheid spatial planning mechanisms and modernist planning, as well as the natural constraints of the ocean and the mountain, have determined the urban form of the Table Bay District. Fine-grained urban environments are surrounded by underutilized land, with a strong reliance on freeways and other barriers to fragment land uses and people. With a growing population of 170 700, there is a push towards policy on public transport and mixed-use integrated environments in the district (TBPDFEMF, 2012).

Compared to the rest of the CoCT, the district consists of high-income areas with strong socio-economic performance. The majority of residents are employed (52.9%). The district is characterized by continuous re-development pressure due to its proximity to the CBD and socio-economic opportunities. Furthermore, this pressure threatens the wellbeing of environmentally sensitive areas and riverine/wetland systems. As a result, very little natural vegetation remains in the district, apart from the Table Mountain National Park. The district consists of a number of neighborhoods, which differ substantially in race, income, amenity and service provision, and character.

Figures 14-16 show the TRUP site in the Table Bay district context. The river and wetland systems form part of the critical biodiversity network of the district (Figure 14). Furthermore, the site is identified as a major structuring open space, with a proposed provincial heritage site and special destination place as its main features (Figure 15). Figure 16 shows that there is scope for new development on the site, primarily on the eastern side in the Oude Molen and Ndabeni precincts.



Figure 14: Riverine and Biodiversity Systems in the Table Bay District (Source: TBSEDFEMF, 2012)

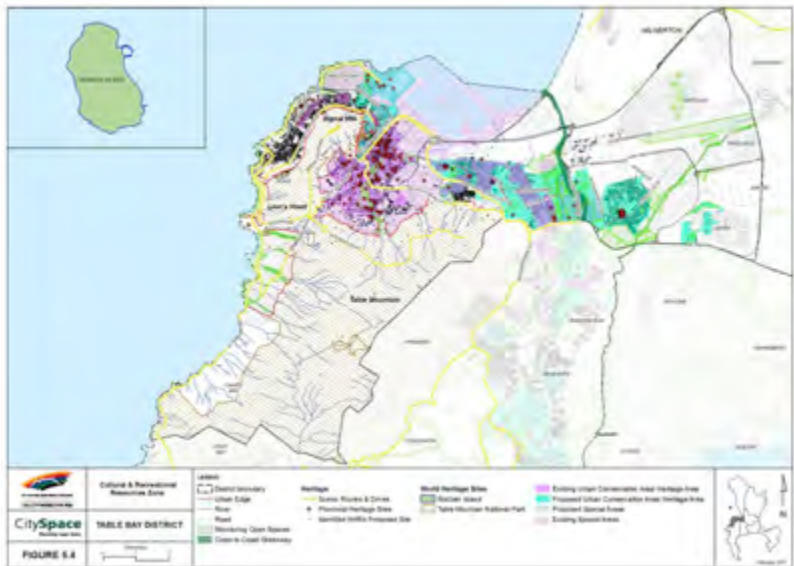


Figure 15: Cultural and Recreational resource Zones in the Table Bay District (Source: TBSEDFEMF, 2012)

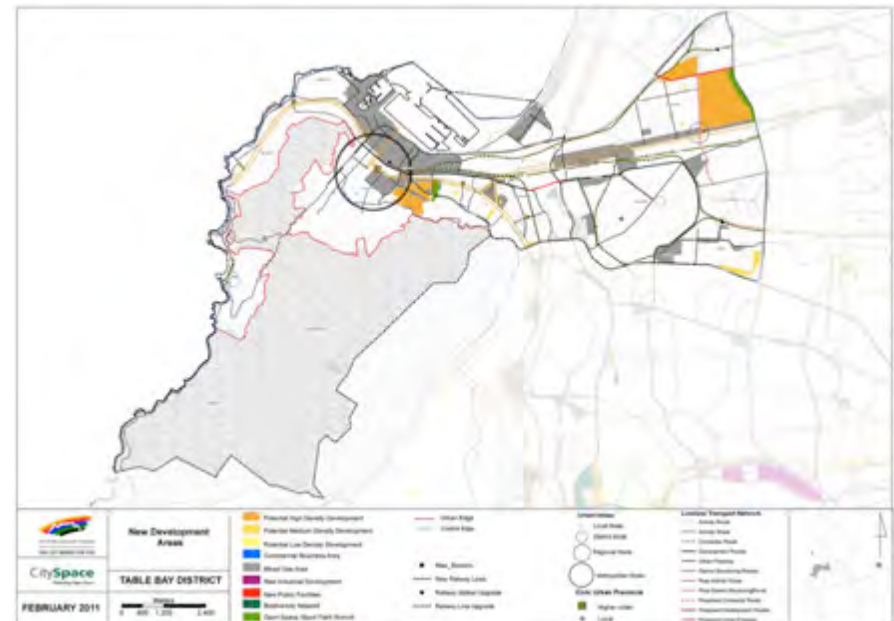


Figure 16: Areas Suitable for New Development in the Table Bay District (Source: TBSEDFEMF, 2012)

### 3.2.4 The Site Context

The TRUP site is shown in figure 17. Then, a scale comparison of the site is presented in figure 18. It shows the size and extent of the TRUP site in relation to other major sites, which have been developed in the city of Cape Town Metropolitan Area. “The development of a radical sustainable community of this scale in the heart of the city will also make a significant advance towards influencing

the transformation of Cape Town into a more sustainable and ecologically sensitive city (CTS, 2012:24).

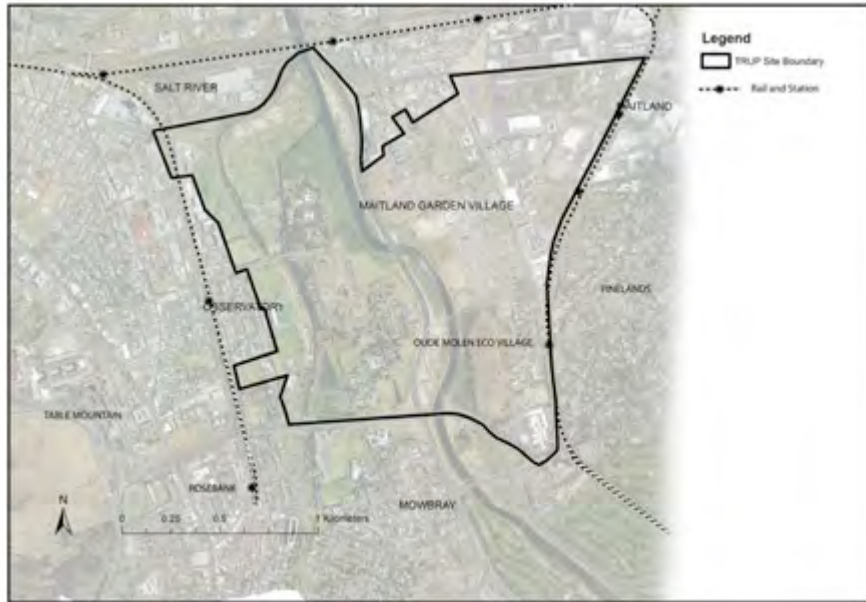


Figure 17: The TRUP Site (Source: Author, 2016 & GIS, University of Cape Town Technical Library, 2016)

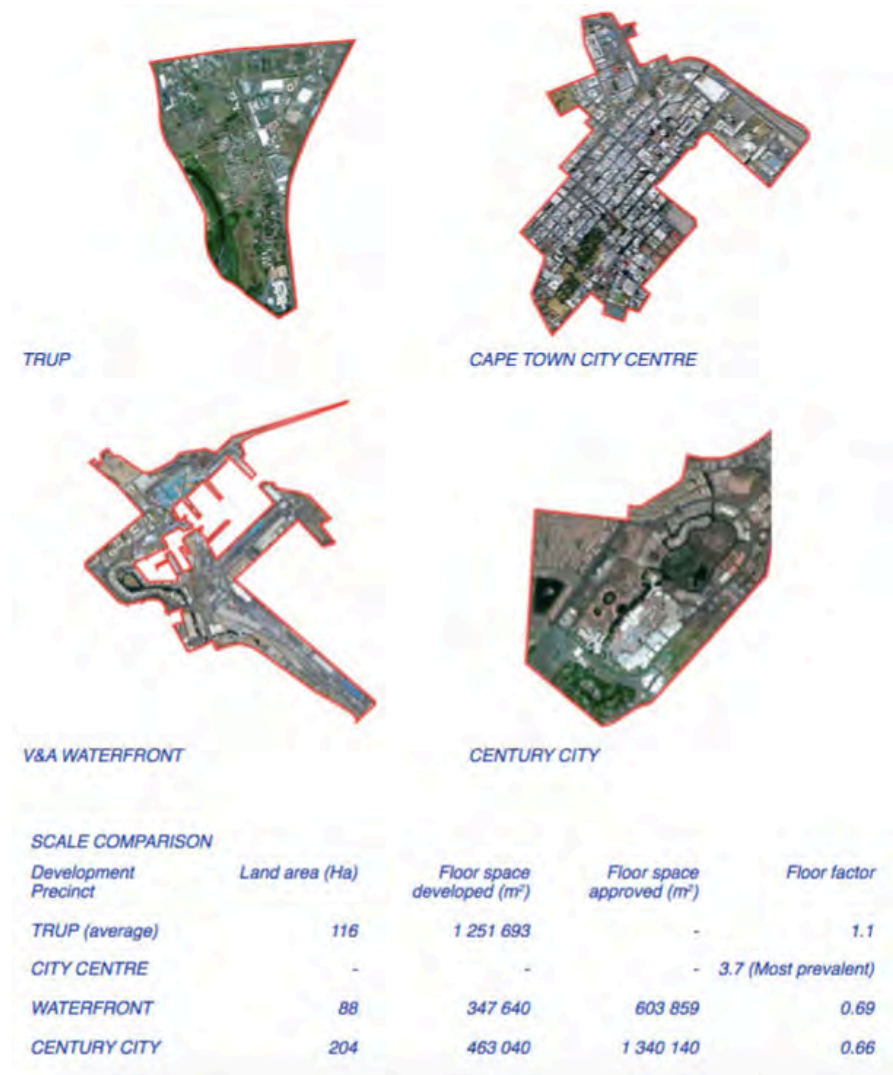


Figure 18: Scale Comparison of the TRUP site in Relation to other Major Sites in the Cape Town metropolitan Area (Source: CTS, 2012)

### 3.3 Relevant Legislative and Policy Context

This section explores the legislative and policy context of the TRUP site in order to understand what legislation and policies are relevant to its analysis and subsequent development. This section is necessary in order to locate the site in terms of policies and the “package of plans” approach, to ensure alignment with policies and legislation at all three spheres of government: national, provincial, and local. Policies and legislation chosen for inclusion in this analysis were selected by the author, as well as by the recommendation of NM Associates, the consultancy who have been granted the current tender for the development of the site. In an interview with Tarryn McCann and Tasyam Govender (2016), the following policies and legislation were deemed most relevant:

#### 3.3.1 National Heritage Resources Act (25 of 1999)

The National Heritage Resources Act (25 of 1999) is applicable as there are a significant number of heritage resources on the two provincial properties. The main aim of the act is to introduce an integrated system for the management of our heritage resources, to promote sound management at all levels, as well as to empower society to nurture and conserve their heritage resources for the benefit of future generations. Heritage resources may include buildings of historic significance, archaeological sites, places that mark pivotal moments in history of the

country, and cultural landscapes in the form of historic places and accompanying groves of trees.

#### 3.3.2 Environment Conservation Act (73 of 1989)

According to the CoCT (2003), the main aim of the Environment Conservation Act is to provide for the effective protection and controlled utilisation of the environment and related matters. It lists several activities, which may have the potential to impact upon the environment, that require an impact assessment. It also prescribes a procedure to be followed during such an assessment.

#### 3.3.3 NEMA

The National Environmental Management Act is the national legislation guiding planning in terms of environmental protection, enhancement, and management. Promulgated in NEMA are a set of Environmental Impact Assessment (EIA) regulations which provide for the development of Environmental Management Frameworks (EMFs). The City of Cape Town (CoCT) has integrated EMFS into each of its district plans to ensure EMFs effectively inform and respond to the planning context. It is problematic that EMFs are framed as inform and respond to the planning context, rather than forming the basis for the planning process. This approach to planning represents an anthropocentric worldview, in

which the natural environment is considered only for the purposes of a development agenda. According to the TBSDFEMF (2012:14), the broad objectives of an EMF are:

- To inform and guide spatial planning in the district;
- To assist in facilitating investment;
- To function as a support mechanism in the environmental impact assessment process in the evaluation and review of development applications, as well as making strategic informed decisions regarding land use planning applications (as an integral part of the district plan);
- To guide sustainable development in the area and determine the environmental management priorities; and
- To provide support to the process of delineating geographical areas within which specified activities are to be identified (or excluded from those listed) in terms of NEMA based on sensitivity of the environment to the potential impacts.

The national environmental management act (107 of 1998) and the nema eia regulations (2010) is applicable given the environmental sensitive nature of the TruP area. According to the CoCT (2003: 35) it is aimed primarily to provide co-operative environmental governance by establishing: principles for decision-making on matters affecting the environment; institutions that will promote co-

operative governance; and procedures for co-ordinating environmental functions exercised by government. Central to this aim is the drafting of Environmental Co-operation Agreements.

#### 3.3.4 National development Plan (2011)

According to the National treasury (2014), the National Government is responsible for the transfer of national funds to support the national development agenda and priorities. National priorities are expressed in the National Development Plan (NDP) which sets the country's strategic direction. The Department of Rural Development and Land Reform is responsible for the creation of a National SDF and Integrated Urban Development Framework (IUDF) which gives spatial expression to the NDP. Chapter 5 of the NDP (2011) sets out the vision of achieving environmental sustainability and resilience, with implications for land use and spatial planning in order to transition towards low-carbon economies and sustainable livelihoods.

#### 3.3.5 National Water Act (1998)

The National Water Act, 1998 (Act 36 of 1998) is applicable to water resources, including rivers and wetlands. As stated in the draft Table Bay District Plan (2011), authorisation of the activities in the Hydrological Environmental Management Zone, which includes TRUP, must be in compliance with the national Water act. The National

Water Act provides for reform of the law relating to water resources, including rivers and wetlands. This law will have specific pertinence to the Park, which is centred around the open spaces and water resources of the Liesbeek and Black Rivers and associated wetlands.

### 3.3.6 DFA

The Development Facilitation Act (no 108 of 1996) stipulates a number of principles, which apply in the Western Cape and have informed the preparation of the CTSDP and Table Bay district plan.

### 3.3.7 Integrated Urban Design Policy

Urban design is concerned with the process of creating holistic and sustainable human settlements. The disciplines of spatial planning, environmental design, architecture, landscape architecture, road and street design all inform urban design.

### 3.3.8 Municipal Systems Act

The Municipal Systems Act (No 31 of 2000) sets out National, Provincial, and municipal planning and performance management regulations (2001). The Act lays out the responsibilities, in terms of spatial planning, of each sphere of government in South Africa and invests greater decision making capacity in the hands of the local municipalities,

rather than the hands of provincial and national government, as was previously the case. The act enables the local municipalities to create and enforce their own context-specific by-laws in an attempt to better align land use decisions with the users of the land in a more bottom-up approach. As such, decisions are guided by the Municipal Spatial Development Framework (SDF) which is a requirement under the Municipal Systems Act (MSA) (2000).

The act requires each municipality to develop and prepare an Integrated Development Plan (IDP) that is used to manage and guide development throughout the municipality and give effect to budgetary and resource allocation (Drakenstein Municipality, 2015b). Additionally, the required development of an Integrated Development Plan (IDP) is an attempt to effectively and efficiently align the spheres of government, their various roles and responsibilities, and their various contributions to budgets and strategies into a single comprehensive and coherent plan. The MSA requires all municipalities to produce an IDP for their area of jurisdiction every 5 years. A central purpose of the Act is to achieve a more integrated spatial planning system.

The MSA (2000) requires each municipality to develop an SDF which is essentially a long term (15-20 year) spatial plan that directs and manages the implementation of the IDP. This framework gives effect to strategies, vision, and goals of the IDP to guide development and public investment within the municipality. The municipal SDF is required to be revised every 5 years in line with the IDP revision process in order to monitor and reconcile its effectiveness alongside the principles of the IDP. Since the CoCT has finalized their SDF and district plans, the attention is now turning to the next scale: local scale SDFs for strategic sites.

### 3.3.9 LUPO and SPLUMA

According to CTS (2012), the Land Use Planning Ordinance, 1985 (Ordinance No 15 of 1985) outlines the procedures and requirements for the approval of Structure Plans as well as for rezoning, departure and subdivision applications. There are presently no approved structure plans pertaining to the TruP neighbourhood or local area. The local spatial planning policies and frameworks dealing with the area have been approved by the city of Cape Town as policy frameworks.

LUPO has since been replaced with the new legislation.

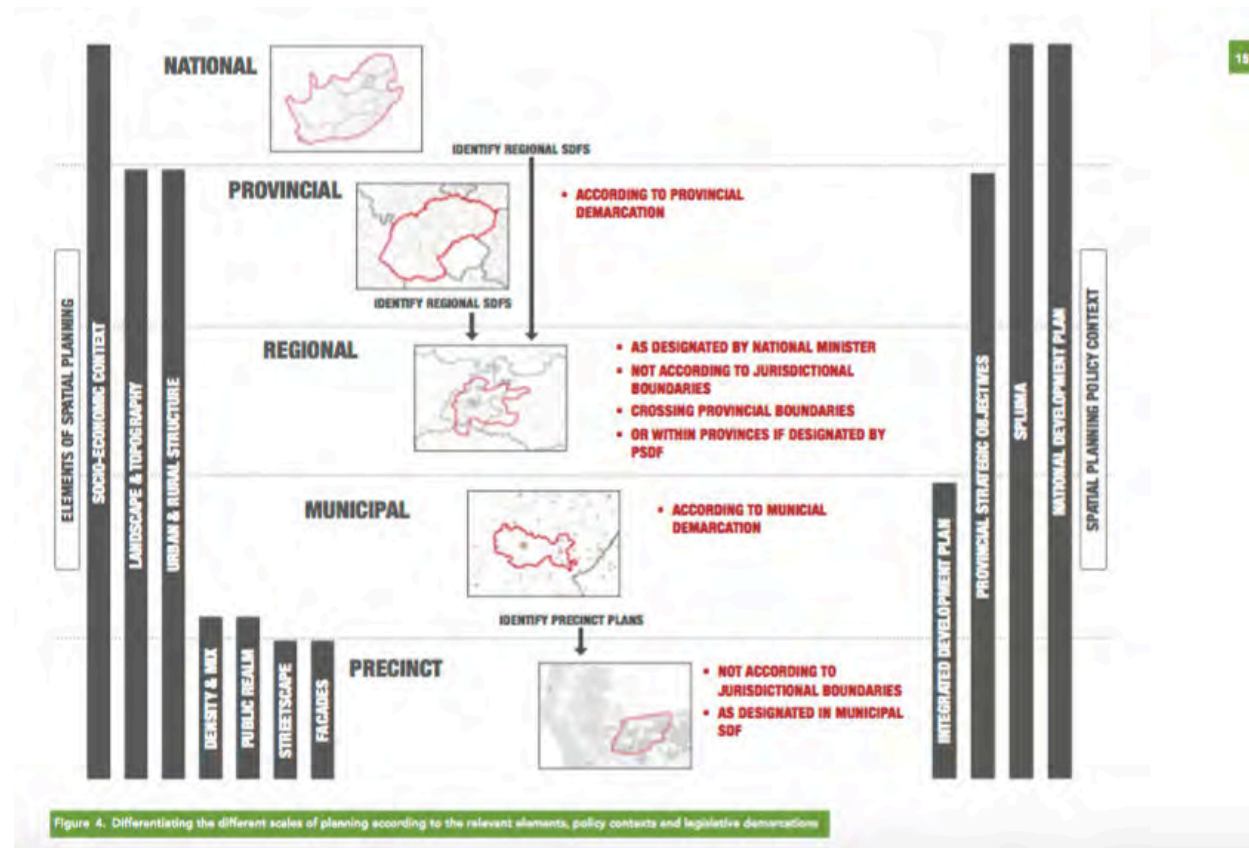


Figure 19: Structure of the “Package of Plans” Approach in the South African Context (Source: Department of Rural Development and Land Reform, 2011)

The Spatial Planning and Land Use Management Act (SPLUMA) (2013) makes clear the functions of each sphere of government in land use procedures. SPLUMA requires national, Provincial, and Municipal spheres of government to develop SDFs with a clear vision, based on thorough analysis and national and provincial planning principles and local long-term goals. As such, SDFs are mandatory at all spheres of governance and should be aligned strategically together. The provisions applicable for the SDF development process are laid out in section 12 (1) of the Act include:

- Interpret and represent the spatial development vision of the relevant sphere of government.
- Be informed by a long-term spatial development vision.
- Represent the integration and trade off of relevant plans.
- Guide planning and development decisions across spheres of government.
- Contribute to a coherent planning approach to spatial planning.
- Provide clear and accessible information to the public.
- Provide direction for strategic development within the specific context and scale.

It lays out a strategy for planning, according to the “Package of Plans” approach, which envisages plans at various levels of detail, becoming progressively more detailed from the regional level (which deals mainly with policy) to plans for smaller areas within the region (dealing mainly with specifics). Figure 19 shows how this approach is structured in the South African context. According to NM Associates (2016), SPLUMA, and its application, are difficult to work with. This is because the legislation is so new and it is poorly understood. The transition from LUPO is yet to be completed in terms of institutional and bureaucratic processes, making the implementation of the new legislation confusing and complex.

The hierarchy of plans could be illustrated as follows, with the scale of the plan this dissertation will develop highlighted:

- National Development Plan
- Provincial SDF
- Table Bay District SDF and EMF
- CapeTown SDF and IDP
- Local Area SDF for the TRUP site
- Detailed Precinct Plans
- Site Development Plans

### 3.3.10 Densification Policy

The CoCT Densification Policy (2012) is a response to

growing urban sprawl, which threatens the wellbeing and presence of natural resources and critical biodiversity and open space areas in the municipality. As a result, the strategy encourages an average city density of 25du/ha in the medium term and provides guidelines to assist planners with development proposals based on the need for infill, intensification, compactness, and densification in Cape Town. Higher densities are encouraged through the use of incentives and disincentives, with priority areas for densification identified alongside other city strategies.

### 3.3.11 Provincial SDF (2013)

The provincial SDF was prepared for the Western Cape Government in 2013. It guides development throughout the province and sets a number of goals and priorities which spatial plans at more local scales should respond to It:

- Focuses on job creation through targeting specific existing and emerging growth potential nodes. Paarl as a proposed regional center and Gouda and Wellington as service centers.
- Harnesses the province’s strengths and connect rural and urban towns through consolidating nodes and clustering facilities.
- Focuses on shared growth and integrated development.
- Goals of broadening economic participation, investing in efficient ‘connectivity infrastructures’,

planning, building and managing effective public and non motorised transport, creating liveable communities, fostering resilient and creative communities, ensuring greater spatial integration, nurturing a culture of tolerance and mutual respect, creating and protecting effective governance institutions

It recognizes the unique biodiversity and natural significance of the province and seeks to enhance its natural potential, primarily through an economic growth perspective. The SDF is focused on social and economic development primarily, with the natural environment as a means of drawing resources for development.

### 3.3.12 Cape Town SDF (2012)

Each municipality is required to compile a spatial development framework (SDF) for the area. The SDF builds on the IDP, and must correspond to the spatial aspect of the IDP. An SDF is a future spatial plan for the province or municipality which maps out its desired vision and growth trajectory. The municipal SDF must be reviewed every 5 years.

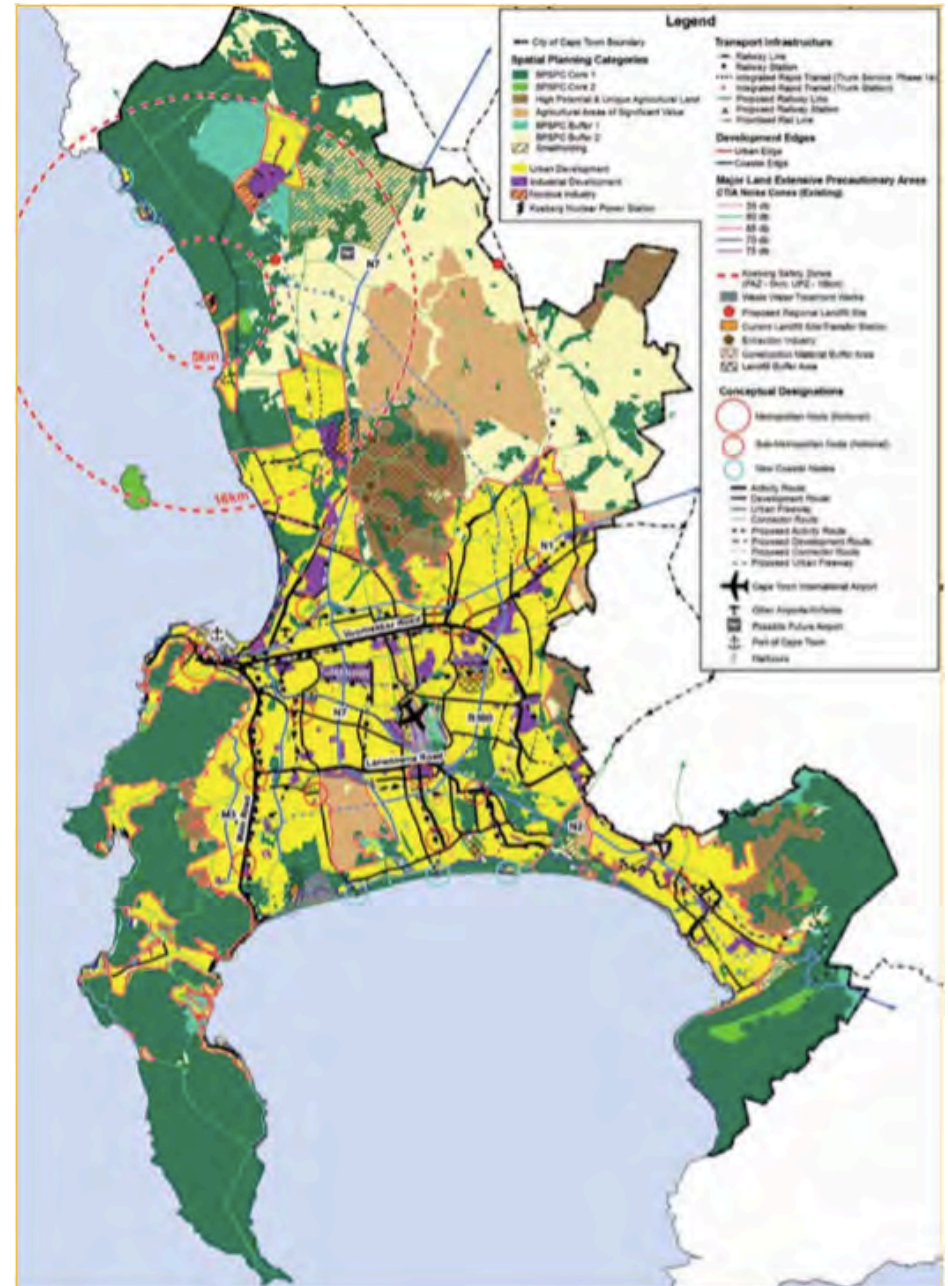


Figure 20: Spatial Development Framework for the City of Cape Town Metropolitan Area (Source: CoCT SDF, 2012)

The Cape Town SDF (2012) (Figure 20) is the long-term citywide spatial plan covering the whole of the Cape Town Metropolitan Area. It was approved, in terms of the Municipal Systems Act (Act 32 of 2000, section 34), by the City of Cape Town in June 2011. It was also submitted to and approved by the Western Cape Provincial Government for approval as a Section 4 (6) Structure Plan, in terms of the Land Use Planning Ordinance (No 15 of 1985).

It indicates that the Two rivers urban Park should be protected whilst the surrounding precincts have been indicated as suitable for urban development.

The CTSDf (2011) aims to:

- Plan for employment, and improve access to economic opportunities
- Manage urban growth and create a balance between urban development and environmental protection
- Build an inclusive, integrated and vibrant city

The following policies in the draft CTSDf (2011) inform the approach to the development of strategically located and/or environmental sensitive areas:

- sustainably manage urban development impacts on natural systems
- improve access to a quality metropolitan open space system (moss)
- Protect and enhance the rural environment

The strategies of the CTSDf are best summarized in Table 3.

Strategy	Sub strategy
<p><b>PLAN FOR EMPLOYMENT AND IMPROVE ACCESS TO ECONOMIC OPPORTUNITIES:</b> To improve the access of people to urban opportunities, the City must adopt an integrated approach to land use planning, economic development and transport operations. Spatial planning will have a limited impact on economic growth and development unless the key drivers of growth are recognised and land and infrastructure are made available to guide and support economic investment and facilitate specialisation in desirable city locations. To this end, the City must ensure that it remains competitive and capitalises on existing and future sectoral comparative advantages to promote economic integration and efficiency. A clear spatial logic is necessary to inform economic investment and accommodate freight and logistics demands and to improve access to economic opportunities.</p>	<ul style="list-style-type: none"> <li>• Promote inclusive shared economic growth and development</li> <li>• Address spatial economic imbalances</li> <li>• Establish an integrated city-wide public transport system that supports the accessibility grid</li> <li>• Integrate land use, economic and transport planning</li> <li>• Support the rationalisation, upgrade and/or development of economic gateways, and manage land uses around them appropriately.</li> </ul>
<p><b>MANAGE URBAN GROWTH AND CREATE A BALANCE BETWEEN URBAN DEVELOPMENT AND ENVIRONMENTAL PROTECTION:</b> To put Cape Town on a more sustainable growth path the City needs to protect and enhance its exceptional natural and rural environments. New urban development should be directed towards locations where its impact on critical biodiversity areas, wetlands and agricultural areas will be minimised. The City needs to promote a compact and efficient form of urban development. Densification must be promoted in appropriate locations in order to improve economies of scale and increase thresholds required for public transport. Urban expansion should be managed and ensure effective and efficient use of the city's resources. Planning decisions must be balanced, weighing the competing and conflicting demands of different interests in order to arrive at an optimum level of consensus to ensure short, medium and long term social equity, economic efficiency and environmental sustainability.</p>	<ul style="list-style-type: none"> <li>• Facilitate urban development</li> <li>• Support incremental development processes</li> <li>• Encourage a more compact form of development</li> <li>• Appropriately protect the citizens of Cape Town from hazardous areas/ activities</li> <li>• Appropriately manage urban development impacts on natural resources and critical biodiversity networks</li> <li>• Make efficient use of non-renewable resources</li> <li>• Protect and enhance the city's rural environment</li> </ul>
<p><b>BUILD AN INCLUSIVE, INTEGRATED, VIBRANT CITY:</b> The City must promote integrated settlement patterns in existing and new residential areas to accommodate Cape Town's growing population and redress social and land use fragmentation. An inclusive, integrated and vibrant city requires that basic services, social facilities and public open spaces are available and accessible to everyone. The City needs to promote equal opportunities, improve the quality of living environments, and reduce the levels of crime. Cape Town's heritage must be respected, protected and enhanced and a network of great destinations and public spaces should be established.</p>	<ul style="list-style-type: none"> <li>• Transform the apartheid city</li> <li>• Proactively support publicly-led land reform and new housing delivery</li> <li>• Encourage integrated settlement patterns</li> <li>• Enhance the unique sense of place and quality of built form of Cape Town</li> <li>• Enhance the value of heritage resources and scenic routes</li> <li>• Promote accessible, city wide destination places</li> </ul>

Table 3: Summary of the Cape Town Spatial Development Framework Strategies (CoCT SDF, 2012)

The Cape Town SDF is shown in figure 20.

### 3.3.13 IDP

An IDP is a vision for the long-term development of the municipality with a special emphasis on the municipality's crucial development and internal transformation needs. The plan involves a review of the existing level of development in the municipality, which must include: an identification of communities, which do not have access to basic municipal services; an SDF which must consist of the basic guidelines for a land use management system for the municipality; applicable disaster management plans and a financial plan which includes a budget projection for at least the next three years. The IDP effectively forms the policy framework and general basis on which the annual budget must be based and provides a framework for co-ordination.

### 3.3.14 Floodplain and River Corridor Management Policy

The Floodplain and River Corridor Management Policy (2009) aims to protect watercourses and wetlands through limiting and managing development and development impacts on floodprone areas. Furthermore, it sets provisions for the maintenance of metropolitan water quality through riverine systems protection strategies, which protect life and property in high risk areas. These provisions are relevant to the development proposal and environmental management strategies, which this research will propose for the site.

### 3.3.15 Management of Urban Stormwater Impact Policy

This policy relates to the quality of stormwater runoff, drainage, seepage, retention. It provides useful guidance for how to manage stormwater in a way which it is returned to the natural environment as a non-pollutant. It is relevant to the TRUP site because the poor quality of the Liesbeek and Black Rivers is largely due to the effects of unsustainable urban development on the pollution of stormwater runoff.

### 3.3.16 Table Bay Spatial Development Plan and Environmental Management Framework

The final draft of the Table Bay Spatial Development Framework and Environmental Management Framework (TBSDFEMF) of 2012 is one of the eight spatial plans created for each district in the City of Cape Town Metropolitan Area. Informed by the city's SDF, the plan covers a medium (approx. 10 year) timeframe. The purpose of the plan is to guide spatial development processes through:

- Alignment with the NDP, PSDF, CoCTSDF, and CoCTIDP to inform urban development and nature conservation strategies, in line with higher level planning frameworks.
- A package of plans approach as a decision making tool.
- Delineating strategies and sensitivities as

informants to decision making.

- Providing a basis for future land use changes and public finance investment priorities.
- Informing and guiding local area and precinct plans and frameworks for detailed land use management and public and private investment.

The plan consists of two components:

- A spatial Development Plan, regarded as a structure plan as provided for in terms of section 4(10) of the Land Use Planning Ordinance (LUPO) (1985) and the relevant sections of SPLUMA (2014).
- An Environmental Management Framework (EMF), developed in accordance with NEMA Act 107 of 1998 and regulations pertaining to EMFs in sections 24(5) and 44.

The EMF is integrated as an input to the SDF in order to achieve the desired state of the environment through appropriate development and environmental management processes simultaneously. This shows an attempt by the TBD for strategic environmental planning which is proactive and well integrated into the spatial planning process. It is a step in the right direction in terms of the integration of environmental and ecological approaches within spatial planning, which should translate into the approach used for the local area SDF which this

research will propose in the following chapter.

The TBSDFEMF focuses on a number of strategies around urban land use intensification around economic nodes and corridor development, as well as accessibility, through an integrated accessibility grid (Figure 21).



Figure 21: Urban Land Use Intensification and Accessibility Concept for the Table Bay District (Source: TBSDFEMF, 2012)

It also aims to manage a sustainable form of urban growth and create a balance between urban development and environmental protection through protection of key environmental resources from inappropriate development. Development edges and environmental areas as no-go zones for development are tools used in this regard. Figure 22 shows natural assets, development edges, and urban development in the district.



Figure 22: Natural Asset, Development Edge, and Urban Development Concept for the Table Bay District (Source: TBSDFEMF, 2012)

A third strategy aims to build an inclusive, integrated, and vibrant city through social facility civic precinct clustering and the creation of special destination places, linked by continuous open space systems and public links (Shown in figure 23).



Figure 23: Social Facility Clustering and the Creation of Special Destination Places in the Table Bay District (TBSDFEMF, 2012)

Socio-economic integration is encouraged through the use of the following spatial model, which illustrates the socio-economic gradient principle from the Western Cape PSDF (2009) (Figure 24).

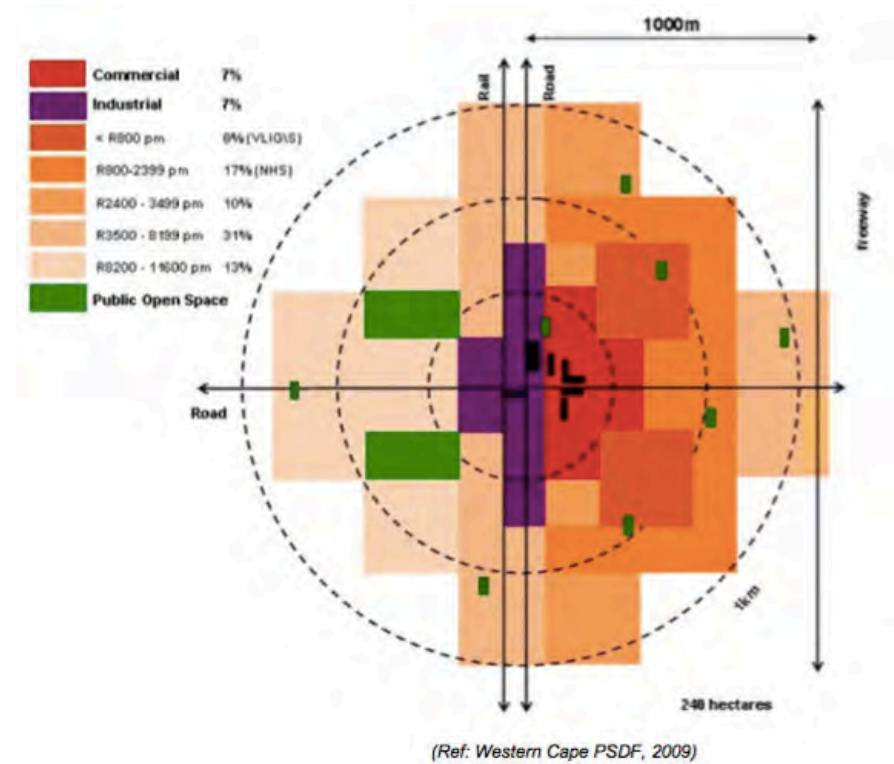


Figure 24: Socio-Economic Gradient Principle (Source: TBSDFEMF, 2012)

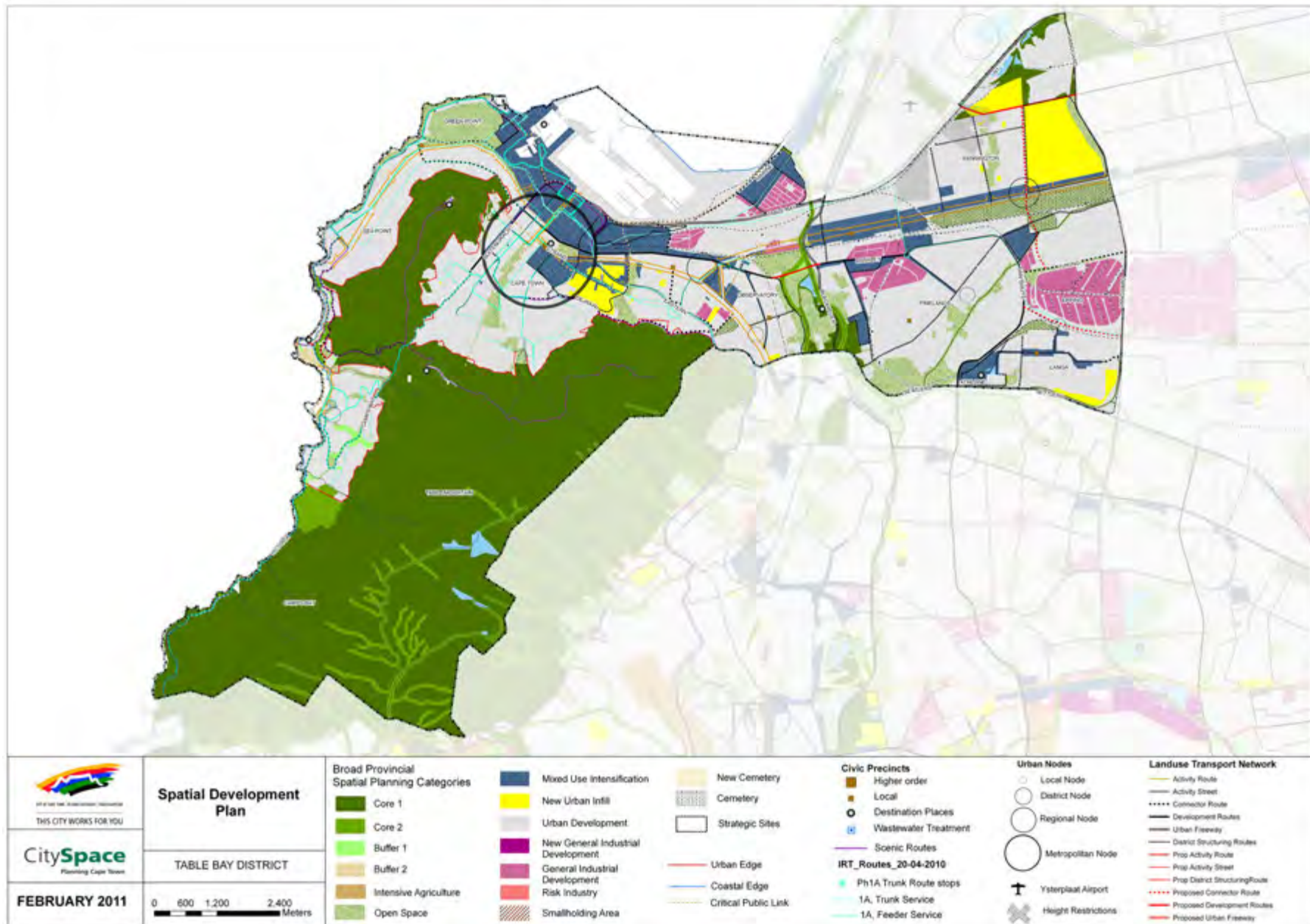
The Table Bay concept is shown in figure 25.



Figure 25: Table Bay Development Concept (Source: TBSDFEMF, 2012)

The composite district SDFEMF is shown in figure 26. It identifies the TRUP site as a vital open space structuring element. It encourages the avoidance of development which will compromise open space linkage and infrastructure. Low impact, sustainable use of open space is encouraged, with development that is sensitive to terrestrial systems, rivers, and wetlands. It identifies cores and buffers for environmental protection and areas for mixed-use urban infill intensification. It identifies the TRUP as a special destination place and earmarks the N5 as an urban freeway and Liesbeek Parkway as a connector route.

Figure 26: Composite District Spatial development Framework and Environmental Management Framework (Source: TBSDFEMF, 2012)



The TBSDFEMF divides the district into sub-districts for more detailed planning. The TRUP site forms part of Sub-District 3 strategy, which promotes intensification through the creation of mixed-use developments on underutilized and developable land and the regeneration of key green open spaces, shown in figure 27 below.

The District Plan identifies various Environmental Impact Management Zones (EIMZ) and provides detailed guidance in terms of accommodating different types of activities within the respective zones. The Two Rivers Urban Park area falls within the following EIMZ's:

- hydrological Zone
- coastal and dune Zone (coastal risk area)
- Conservation and biodiversity zone
- Cultural and recreational resources zone

According to the TBSDFEMF (2012), the area defined as the Two Rivers Urban Park, located at the confluence of the Black and Liesbeeck Rivers, provides an ideal location for the creation of a metropolitan scale park as it comprises extensive open spaces, sensitive ecological systems and habitats, significant institutions, historic buildings and cultural and heritage landscapes. The area is situated on the edge of the inner city adjacent to dense residential and other land uses. From a district spatial perspective, the proposed park is significant as it forms part of a conceptual



Figure 27: Sub-District 3 Strategy (Source: TBSDFEMF, 2012)

coast to coast greenway which links open spaces from False Bay to Table Bay.

The existing state of the natural environment means that considerable investment is necessary to enable the establishment of a quality park. Environmental degradation and the continued demand for land together with institutional and procedural challenges makes this a challenging project. However, the benefit that it would afford the wider community is of such significance that continued efforts should be made to realise its full potential. The park can provide recreational facilities that are of particular advantage to the wider surrounding city areas and neighborhoods where there is an under-supply of open space. As part of the park development, the rationalisation and upgrade of existing institutions on the site should be addressed.

### 3.3.17 TRUP Contextual Framework and Phase 1 Management Plan

A number of planning processes have been undertaken for the Two Rivers Urban Park and immediate surrounding area as well as for the Oude Molen precinct. The Two Rivers Urban Park Contextual Framework and Phase 1 Environmental Management Plan (August 2003) is the current approved city policy for the area, shown in figure 28.



Figure 28: TRUP Contextual Framework and Phase 1 Environmental Management Plan (CFMP, 2003)

The process of preparing this framework, which was previously called the Black River Urban Park Spatial Development Framework, was initiated in 1998. The Two Rivers Urban Park Contextual Framework and Phase 1 Environmental Management Plan (August 2003), includes a Baseline Heritage Study, Traffic Impact Assessment and

Avifauna & Flora study. A Draft Landscape Framework (September 2006) formed part of the 2nd Phase of the Environmental Management Plan whilst a Business Plan was finalized in October 2007 by the City of Cape Town. This business Plan is however currently being updated.

The TRUP Contextual Framework aims to:

- Provide a framework for the conservation, rehabilitation and management of the ecologically sensitive areas, open spaces and culturally significant sites within the TRUP Contextual Framework Study Area
- Provide guidance to authorities, landowners and prospective developers to ensure appropriate and integrated development of the precincts immediately adjacent to the park.

The Phase 1 Management Plan focuses on the management of the City-owned land, i.e. the park and wetlands and includes recommendations for improving water quality, avifauna diversity and biodiversity. It includes high-level guidelines to assess development proposals as well as a list of relevant legislation and regulations. It articulates a vision for the park as being: "to rehabilitate, protect, secure and enhance the intrinsic ecological qualities of the area, to conserve the unique cultural landscape, to encourage environmental education, to

maximise opportunities for all people, and to promote sustainable development" (CoCT, 2003: 5).

The TRUP Contextual Framework and Phase 1 Management Plan (CFMP) (2003) argues that TRUP is one of a few parks planned for the CoCT. Others include Wingfield and Philippi Parks. It argues that in the present context of the need of equity and social justice, public investment should be targeting more impoverished areas, in the south-east of the city, for investment in public amenities, such as parks. As such, the development of TRUP is not an urgent social necessity. However, the creation of the park is nevertheless important to ensure environmental sustainability and to enhance the quality of life of city dwellers. The urgency of beginning to protect and rehabilitate what little is left of the natural environment has brought the Two Rivers Urban Park area to the forefront of the City's attention. "Admittedly, the potential and value of the site, as a public resource has long been neglected" (CoCT, 2003: 6).

The CFMP aims to develop a concept for an urban park, which is mindful of the needs of the people in the city and of environmental concerns. As such, it aims to develop the area so that a mix of development and parkland are achieved. The CFMP proposed a set of planning guidelines, uses, and activities, in order to achieve the envisioned character of the site. It does so by proposing these guidelines by individual precinct on the site. The CFMP

(2003) identifies a number of management policies for the effective management of the park area. They are:

- River and Wetland Management
- Management of Recreation Facilities
- Management of Access, Uses and Security
  
- Management of Development Proposals
- Management of Infrastructural Services
- Management of Human Resources
- Management of Research, Training and Monitoring
- Management of Finance and Marketing

While the CFMP (2003) provides a good starting point for the environmental management of the park space on the site, it does not take into account the wider TRUP local area, as identified in more recent plans, which include Ndabeni. Additionally, this document, although legally binding, is out of date. It is largely unclear as to why none of this plan has been realized, but it is speculated that it is as a result of the absence of a holistic and integrated SDF and EMF for the site.

### 3.3.18 Two Rivers Urban Park Local Area Sustainable Neighborhood: High Level Development and Urban Design Concept

This report, by CTS (2012), provides a vision and concept for a sustainable neighborhood on the TRUP site. It briefly explores development potential in relation to constraints

that have restrained development to date, beyond the public park boundaries. It puts forward an urban design concept for the TRUP site which aims to transform the wider area of the site into a high density, mixed-use, sustainable neighborhood, demonstrating a new approach to local area planning as a catalyst for the city's regeneration agenda. It aims to leverage local and provincial government support for its innovative concepts. The report provides high level precinct urban design guidelines, which could form the precinct scale plans in this research's package of plans approach. A critique of this document is the fact that it does not provide usable strategies for the site as a whole, and is narrowly focused on design. Its concepts and ideas require the formal development of a SDF for the local area as a whole. The progressive proposals in this document, whilst having the potential to offer groundbreaking advances for the planning of Cape Town in the future, were never fully legitimized or formalized directly. However, the ideas, which this document generated are carried forth and echoed in many of the other existing plans for the area, which will be discussed later in the chapter.

CTS's document (2012) did expand on the work in the TRUP Contextual Framework of 2003 by including city-owned properties and adjacent areas in the planning of the site at a local scale, realizing that the site boundaries identified in 2003 were too constraining and limited the site's potential

as an entire neighborhood, well integrated with its surrounds. As a result, the boundary of the site was expanded through this policy to include Ndabeni, shown in figure 29.



Figure 29: Expansion of Site Boundary to Include Ndabeni (CTS, 2012)

According to CTS (2012), the heart of the development of the site lies in the river systems and the urban park itself. Views of the parkland and of the mountain are assets to the site, giving it a unique natural and environmental character. According to CTS (2012), the urban development potential of the site lies in underdeveloped and underutilized land within the Oude Molen, Alexandra, and Maitland Garden precinct areas, which offer opportunities for brown-field development, and mixed-use intensification. CTS (2012) identifies areas within the site boundaries for possible development, shown in figure 30.



Figure 30: Areas on the TRUP Site Identified for Possible Future Development (Source: CTS, 2012)

They argue that once development constraints, such as flood lines and wetlands, are excluded, the land area making up these areas for development amounts to 110ha.

The TRUP urban design concept done by CTS (2012) is shown in figure 31. The vision is for a sustainable, high-density, mixed-use neighborhood to compliment the public

park. While the concept is a noble attempt at proposing development, which is sustainable, it lacks in its connection with the natural environment as a main informant for development options. It does, however, evoke some interesting ideas around sustainable infrastructure. The feasibility of the concept is dependent on the extent to which it can address the concerns around infrastructure capacity. It is focused on densities, and arguably fails to capture the full extent of the natural resources of the site. While this concept was never accepted as legislation, it provides some useful guidance in terms of policy, specifically on a detailed precinct scale, envisioning a range of scenarios for each precinct on the site.



Figure 31: TRUP Urban design Concept (Source: CTS, 2012)

### 3.3.19 TRUP Terms of Reference

In 2015, the CoCT and Provincial government released the tender for the professional suite of services, including an SDF, detailed precinct plans, and environmental framework for the site. This process was advertised to include a number of specialist studies. The tender applications were received and accepted. The spatial development planning of the site is now underway, with NM Associates winning the tender process. The planning process began in August of 2015. At the time of the author's interview with NM Associates (2016), the planning team was in the process of compiling an SDF for the area, as well as detailed precinct plans, based on a thorough contextual analysis, completed in February 2016.

### 3.4 Consistent Policy Themes Across Scales

While the metropolitan and district level plans vary in terms of the detail of certain proposals, several themes are consistent including:

- Improving conditions for local economic development and recognising that job creation is critical;
- Protecting the natural assets of the city and allowing appropriate access to natural resources;

- Improving environmental quality and rationalising the undeveloped open space;
- Improving access to public facilities and clustering them within nodes close to public transport interchanges;
- Establishing and maintaining a system of movement routes that ensure equitable access across the city.

It is interesting to note, across scales, that there is yet to be a comprehensive and holistic SDF to guide development over the TRUP local area into the future. There is consistency in identifying the site as having exceptional potential for innovative ways of development, which are an integral part of the site's ecological significance. This dissertation will aim to provide such a framework.

Furthermore, there is a lack of deep enough understanding about the hydrological and ecological systems on the site, and little mention of their management on a number of scales, in order to encapsulate the water catchment areas and larger ecological context. This lack is evident, due to the surprising lack of deep engagement with the natural systems on the site in previous policies. In this way, the natural environment, apart from the identified parkland, has previously been analyzed through an anthropocentric lens, with nature considered in relation to human and development uses. In this way, most of the proposals seem to want to protect the natural environment in a way which

separates it from human development completely. This approach, according to this dissertation, is unsustainable. The two are intertwined and deeply connected, and the SDF this dissertation will put forward will aim to fill this gap. The following section explores the complexity of the site and analyzes it through a number of layers.

### 3.5 Strategic Analysis

This section provides an analysis of the status quo of the site, developed through mapping, desktop research, overlaying, and the design process. The analysis is as follows:

#### 3.5.1 History, Culture and Heritage

In terms of the site history, 2000 years ago, before any settlement occurred, the site was used, according to the Baseline Heritage Study, by seasonal hunter-gatherers to collect food and hunt (CoCT, 2003). The precolonial landscape was one of nomadic pastoralists bringing their herds to graze on the site. Early Dutch settlers grew crops on the site and began to establish farms, such as Valkenberg and Bloemendal. The British colonial period brought with it industrialization and rapid development. The site was largely not affected and farming continued, with the site having a distinct agricultural sense of place. Road construction and the canalization of the two rivers, following flooding in 1941 and 1943, have shaped the

landscape we see today. Furthermore, the establishment of railway lines contributed to its current layout (CoCT, 2003).

A Baseline Heritage Study was undertaken in 2002 by Aikman Associates, in response to the CoCT's terms of reference, in order to provide guidance for the nature and scale of future development. Five heritage areas were identified by the Baseline Heritage Study, in which Heritage Impact Assessments (HIA) may be carried out in terms of the National Heritage Resources Act 25 of 1999. The latter lists certain criteria, which outline when a HIA is required. The heritage areas include references and focal points, many of which are considered conservation worthy. These resources assist in identifying the built form and landscapes to be retained, and should inform and give order to the urban form, scale and character of future development.

These include both the historic buildings and their relationship to the landscape in terms of axial vistas, trees, topography and visual prominence, which in their entirety should be retained and enhanced as far as possible. Shown in figure 32, they are defined by the CoCT (2003: 11) in the TRUP Contextual Framework and Phase 1 Management Plan as follows:

- The Valkenberg Manor House (reception area to Courtyard Hotel), Wild Fig Tree, the Werf, Graveyard, the visual relationship between the Valkenberg Manor House, the Liesbeek River, adjacent wetland

and mountain beyond, views of Valkenberg Manor House, and the sense of place created by the courtyard (Heritage Precinct B, Figure 32).

- The main Valkenberg Hospital building, the central forecourt, projecting wings, the surrounding associated buildings and private network of spaces (Heritage Precinct B, Figure 32).
- The Nieuwe Molen (Alexandra Mill) (Heritage Precinct C, Figure 32).
- The Observatory and surrounding historical buildings within their landscape context, and the visual link between the Liesbeek River and Observatory Hill (Heritage Precinct A, Figure 32).
- The Oude Molen complex and its surrounding landscape, and the visual corridor from Oude Molen down to the Black River (Heritage Precinct E, Figure 32).
- Administration Block of the Alexandra Institution and large open space in front of it, as well as the adjacent buildings and spaces in between (Heritage Precinct C, Figure 32).
- The main building of the River Club, and the visual corridor and axial approach from the entrance of the River Club to the building (Heritage Precinct A, Figure 32).
- The historic building which houses the Chinese School/Association (Heritage Precinct D, Figure 32).

- Interrelated courtyard spaces and typology of the Valkenberg East buildings (Heritage Precinct E, Figure 32).
- Maitland Garden Village (Heritage Precinct D, Figure 32).

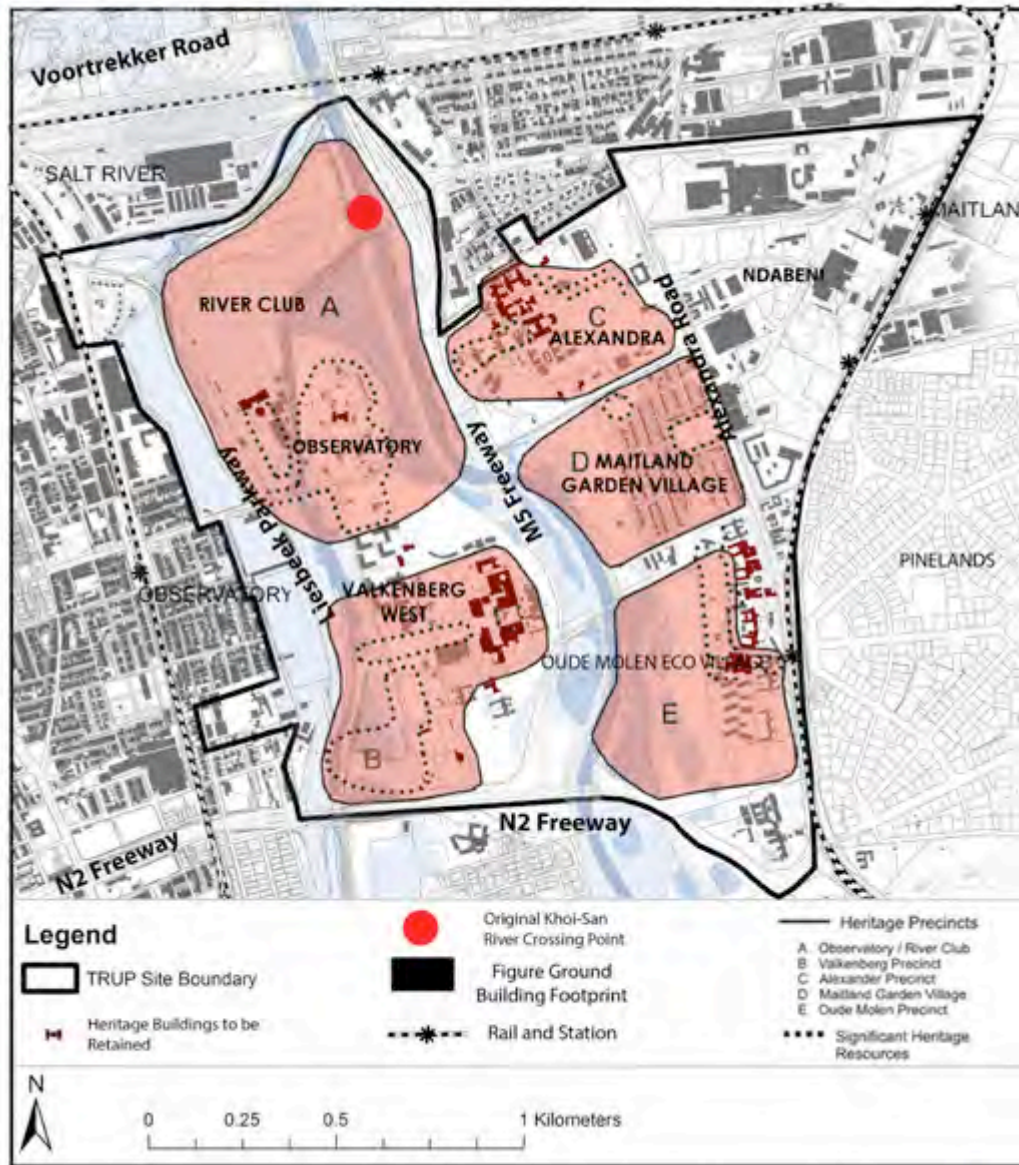


Figure 32: Significant Heritage Resources (Source: Author, 2016 & GIS, University of Cape Town Technical Library, 2016)

Additionally, the Khoi-San people, in the past, used the site for grazing of livestock and moved around on the site. According to Tamsin Faragher (2016), the Khoi-San used to cross the river at the point shown in Figure 32. As a result, the TRUP site holds significant heritage for these people and this should be taken into account in planning processes. This claim to the land, evident throughout the current public participation and stakeholder engagement processes, should, according to Tamsin Faragher (2016), at least be memorialized. She also notes how the Khoi-San could be seen as an example of a community who had a close relationship with the land and nature, and of a community who, even after moving off of the land, left no trace or negative impacts on the natural environment. She argues that we only know that they used the site through paintings which have since been discovered (not available to the public).

### 3.5.2 Systems Analysis

In order to understand some of the systems within the site boundary, the district scale is chosen to capture the full extent of the natural systems within their broader contexts. It is important to understand the wider systems that extend beyond the site boundaries in order to effectively understand the site through a systems approach, which this dissertation promotes. In this way, natural and human systems on the site are contextualized and recognized as

being part of larger systems, on a number of scales, on which any proposals or strategies should seek to improve.

### 3.5.2.1 Hydrological and Wetland Systems

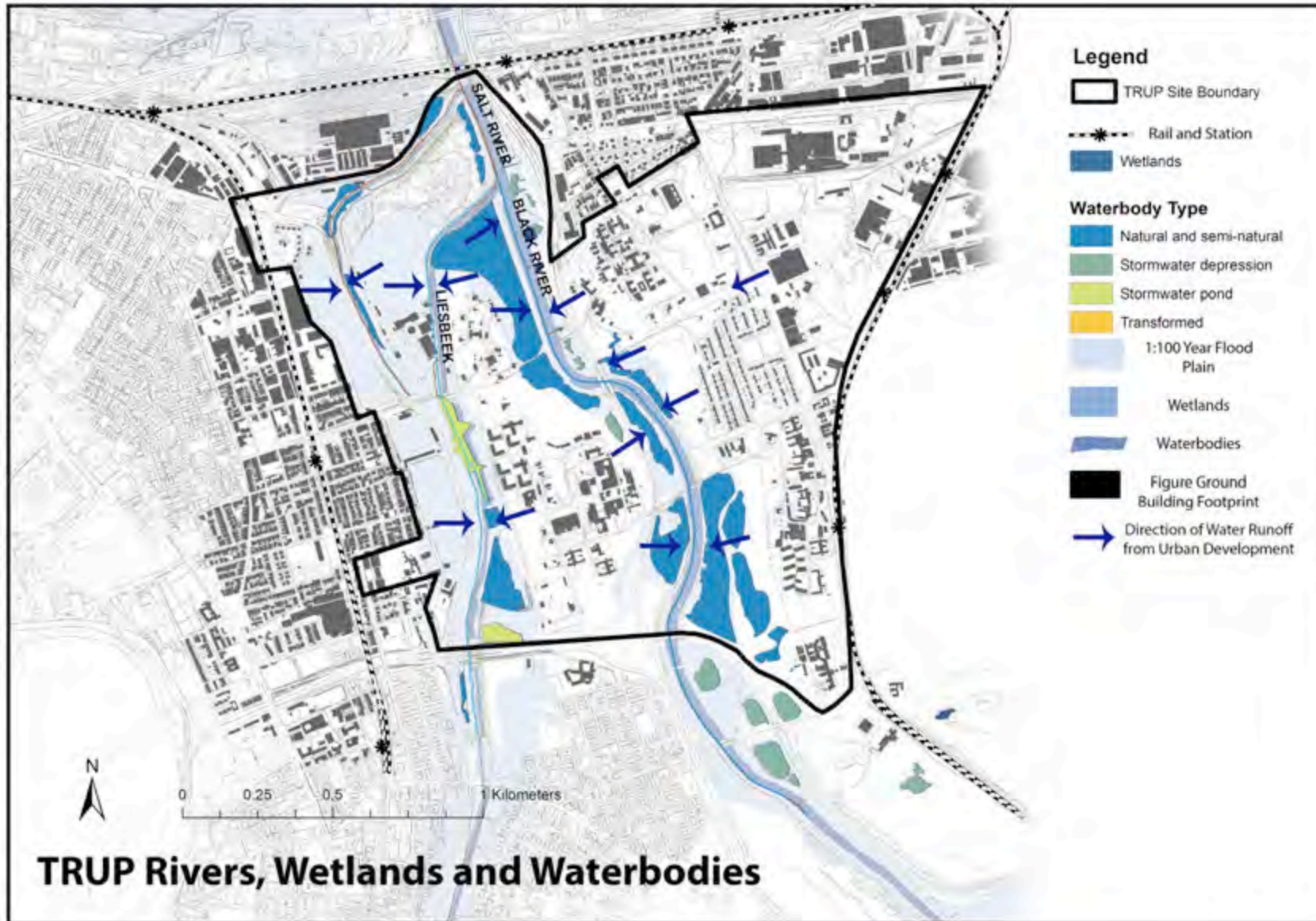


Figure 33: TRUP Hydrological Systems (Source: Author, 2016 & GIS, University of Cape Town Technical Library, 2016)

Figure 33 shows the TRUP hydrological systems on a site scale. The two rivers on the site, the Liesbeek and Black Rivers both form part of the Salt River Catchment Area. Each with their separate management stakeholders, the rivers and their associated wetlands flow from the south of the TRUP site to the north. At a site scale, the rivers meet towards the north (Shown in Figure 33). The Raapenberg and Pallotti wetlands, shown in figure 36, are virtually all that remains of the once extensive wetland system that originally occurred along the Black River. They are found on the site, shown in figure 36. They play an important role in the health of the river and should be retained, managed, and restored to good condition. Furthermore, the site plays an important role in flood attenuation, with a combined upstream catchment area of 224m<sup>2</sup>. Figure 34 is an infographic developed from the State of the Rivers report of Cape Town (2005). It describes the major impacts on the two rivers, as part of the Salt River Catchment in the central rivers category for Cape Town. It shows that the state of both the Liesbeek and Black Rivers is not ideal. The Black River is so polluted, that it is unsuitable for both human and fauna contact. The rivers are mainly polluted along their courses, with the Black River pollution as a result of urban development, rural waste disposal, and industrial wastes. This is due to the fact that the river catchment runs through the informal settlements, which do not have sufficient water infrastructure to facilitate effective water quality management. The river also flows through the Cape Town

industrial areas and is subject to waste disposal as a result. It also runs through the Athlone Waste Water Treatment Works (WWTWs), at the south boundary of the site. As such, the rivers are highly polluted and in a fairly poor state when water arrives on the site, despite being in a better state than when it entered the WWTW. This is problematic for human recreation, usage, and dependence. It also negatively affects the flora and fauna in the region. Because of the state of the rivers, their associated wetlands are also of poor quality and need to be managed effectively. The pollution of the rivers, from their sources and along their courses, is shown in figure 35. Pollution of the rivers is also as a result of polluted stormwater runoff which, due to the site's topography, runs downhill, from areas of urban development towards the rivers. The direction of this polluted runoff flow is shown in figure 35.

## MAJOR IMPACTS

### ALIEN VEGETATION

Most of the indigenous riparian vegetation has been removed and replaced by invading alien plants (kikuyu, poplars, wattle).

Water hyacinth clogs the water surface of the Black River, depleting oxygen, smothering aquatic life, fostering mosquitoes and restricting water flow. This requires continual clearing and maintenance. Mechanical removal of water hyacinth causes large scale river bed disturbance. A range of aquatic weed control methods are available for managing specific problem plants (see p. 42).

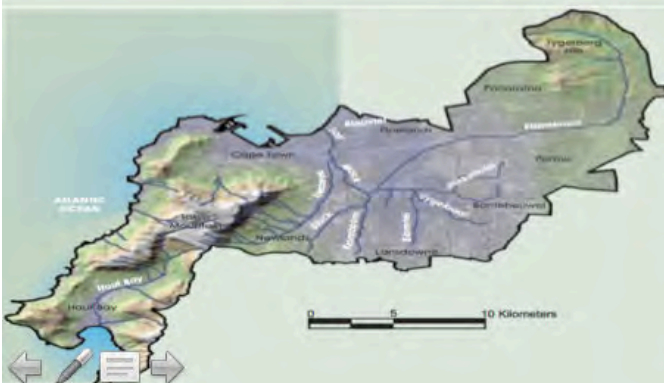
### ALIEN FISH

The lower Liesbeek, Elsiekskraal and Black rivers are dominated by alien fish (carp, catfish and tilapia). Competition for food or habitat and predation has caused the near disappearance of indigenous Cape galaxias.

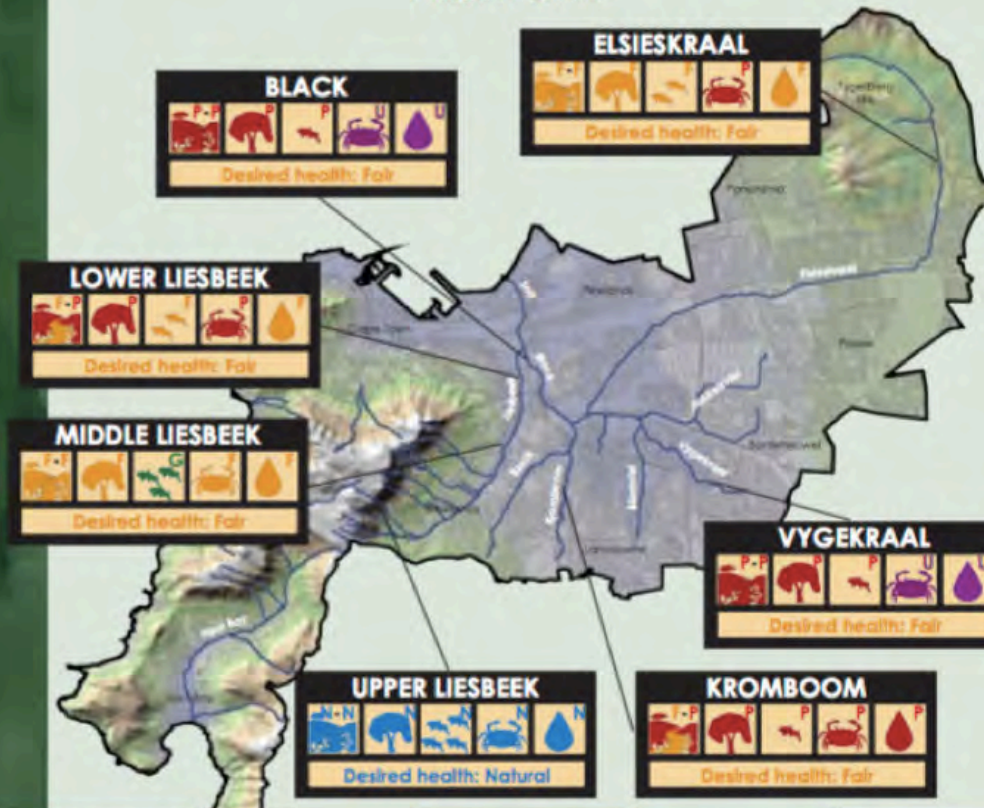
### URBAN DEVELOPMENT

Most of the rivers flow through densely populated urban areas and have been canalised with a resultant loss of goods and services (ability to process and dilute waste).

Poor water quality in the middle and lower reaches results from wastewater discharges, stormwater runoff and litter disposal. This reduces ecosystem functioning and poses a risk to human health. Monitoring of the Black and Vygekraal rivers over recent years has shown a decreasing trend in water quality and ecological functioning. The state of these rivers has deteriorated from poor to very poor over the past few years.



## CENTRAL RIVERS (SALT) PRESENT STATE



Management Area	Southern	Eastern	Central	Northern
River & main tributaries	Sand (Diep, Keyzers, Westlake), Zeekoe (Big Lotus, Little Lotus), Silvermine, Else, Krom, Schusters, Bokramspruit	Steenbras, Sir Lowry's Pass, Lourens, Eerste, Kulis, Bottelary, Jonkershoek, Blaauwklippen, Bonte, Kromme, Plankenbrug	Hout Bay, Liesbeek, Black, Kromboom, Vygekraal, Elsiekskraal, Salt	Diep, Mosselbark, Riebeek, Sout, Silverstroom, Buffels, Modder
Catchment size (km <sup>2</sup> )	471	588	327	1087
Geology	Table Mountain Group (quartzitic sandstones), Cape Granite and sandy sediments	Table Mountain Group (quartzitic sandstone), Cape Granite, Malmesbury Group (shale) and sandy sediments	Table Mountain Group (quartzitic sandstone), Cape Granite, Malmesbury Group (shale) and sandy sediments	Malmesbury Group (shale), Cape Granite, Klipheuvel Group (conglomerates) and sandy sediments
Vegetation	Fynbos (Sandstone, Sand and Granite) and Strandveld (Dune)	Fynbos (Sandstone, Granite and Shale) and Renosterveld (Shale and Alluvium)	Fynbos (Sandstone, Sand and Granite), Renosterveld (Shale) and Strandveld (Dune)	Fynbos (Sand), Renosterveld (Shale and Granite) and Strandveld (Dune)
Mean Annual Precipitation (mm)	711	907	764	475
Mean Annual Evaporation (mm)	1400	1421	1400	1477
Mean Annual Runoff (million cubic metres)	73	245	56	114

Figure 34: Infographic Illustrating the State of the Rivers on the TRUP site (Source: Author, 2016 adapted from State of the Rivers, 2007)

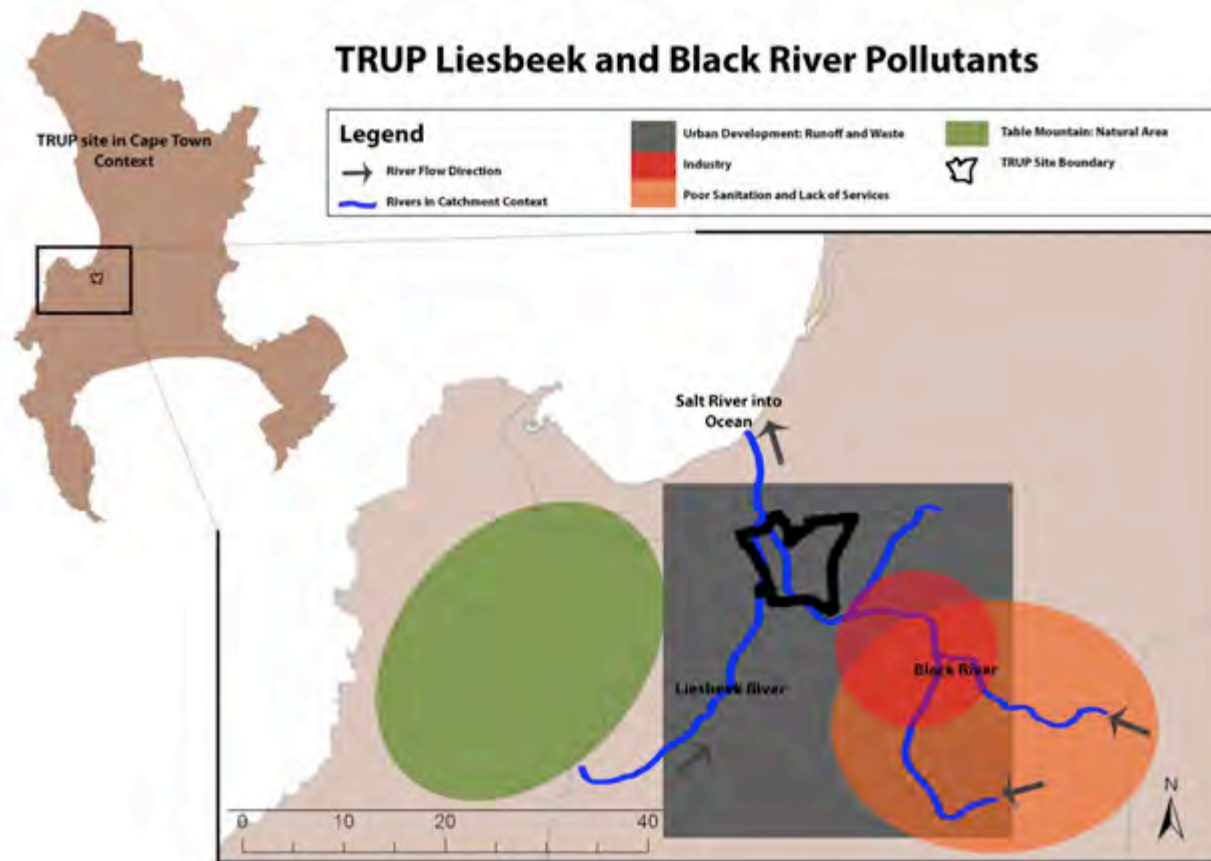


Figure 35: Conceptual River Pollution (Source: Author, 2016)

### 3.5.2.2 Biotic and Climatic Systems

The TRUP local area provides a range of habitats for avifauna and plant species, and plays an important role in the broader biological corridor system, which stretches across the Cape Metropolitan Area.

In terms of the flora and fauna on the site, the avifauna and plant species report (annexure 3 of the CFMP) (2003), lists a number of birds which make their homes along the Black River and its associated wetlands. The Raapenberg Bird Sanctuary, shown in figure 36, is a ten hectare protected area between the Liesbeek and Black Rivers, just to the right of the Observatory. It, too, is both a home and nesting ground to a wide variety of birds, listed in the report and thus requires preservation. There is also a high concentration of the endangered Western Cape leopard toad, as well as a variety of other frog species, along the Liesbeek River, particularly around the Observatory, shown in figure 36.

In terms of flora, the avifauna and plant species report recognizes 38 indigenous plant species, and 51 alien species. The areas in which alien species are predominantly found are poorly understood and defined, and are given very little mention in previous policies. Figure shows the South African National Biodiversity Institute (SANBI) classifications of natural vegetation remaining on the site. It also shows the areas of significant biodiversity, which situate the site and its biodiversity within the larger

city biodiversity classification context. Worthy of mention is the fact that the *Moraea aristata*, endemic to the northern areas of the CoCT, is found near the Observatory on the site. Shown in figure 37, this species of flora is critically endangered and only occurs in peninsula shale renosterveld vegetation. Its occurrence on the site is the last remaining trace of this floral species in the world. Its location on the site is shown in figure 36.

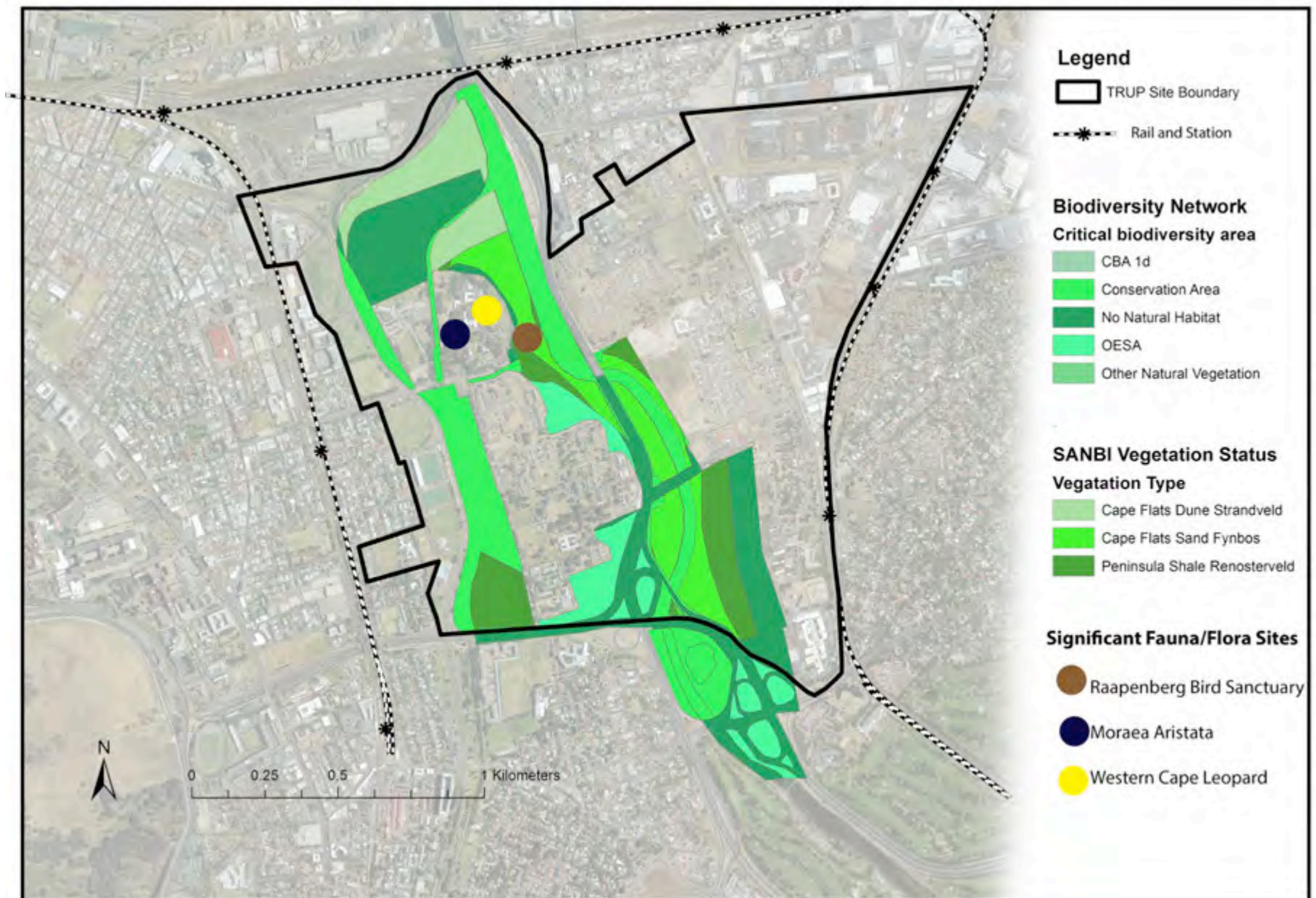


Figure 37: *Moraea Aristata* (Source: Google Images)

SANBI classifies the biodiversity on the site as containing Cape Flats Dune Strandveld, Cape Flats Sands Fynbos, and Peninsula Shale Renosterveld, shown in figure 36.

In terms of biodiversity, figure 36 shows the critical biodiversity areas, conservation areas, natural vegetation, and other ecological support areas (OESAs). These natural assets are located primarily around the riverine system.

Figure 36: TRUP Biodiversity, Vegetation, and Significant Fauna and Flora Sites  
 (Source: Author, 2016 & GIS, University of Cape Town Technical Library, 2016)



The Local Cape Town region has a Mediterranean climate, which means that the study area experiences warm dry summer and cool wet winter conditions. The study area, being very flat and vast, is constantly exposed to the predominant winds which blow consistently throughout the year.

During the winter months, the wind, which is associated with cold fronts and rain, blows out of a north-westerly direction. This holds flood risks for the very flat study area (discussed and shown previously) and artificial drainage mechanism will be needed to accommodate intensive urban development.

The south-easterly wind is the predominant wind which occurs during the summer months and although the North-Westerly wind is associated with rain, the South-Easter is the most problematic. This is because of the South-Easterly wind reaching speeds in excess of 50km/h, resulting in high levels of human discomfort in areas associated with loose sandy soil, such as the study area.

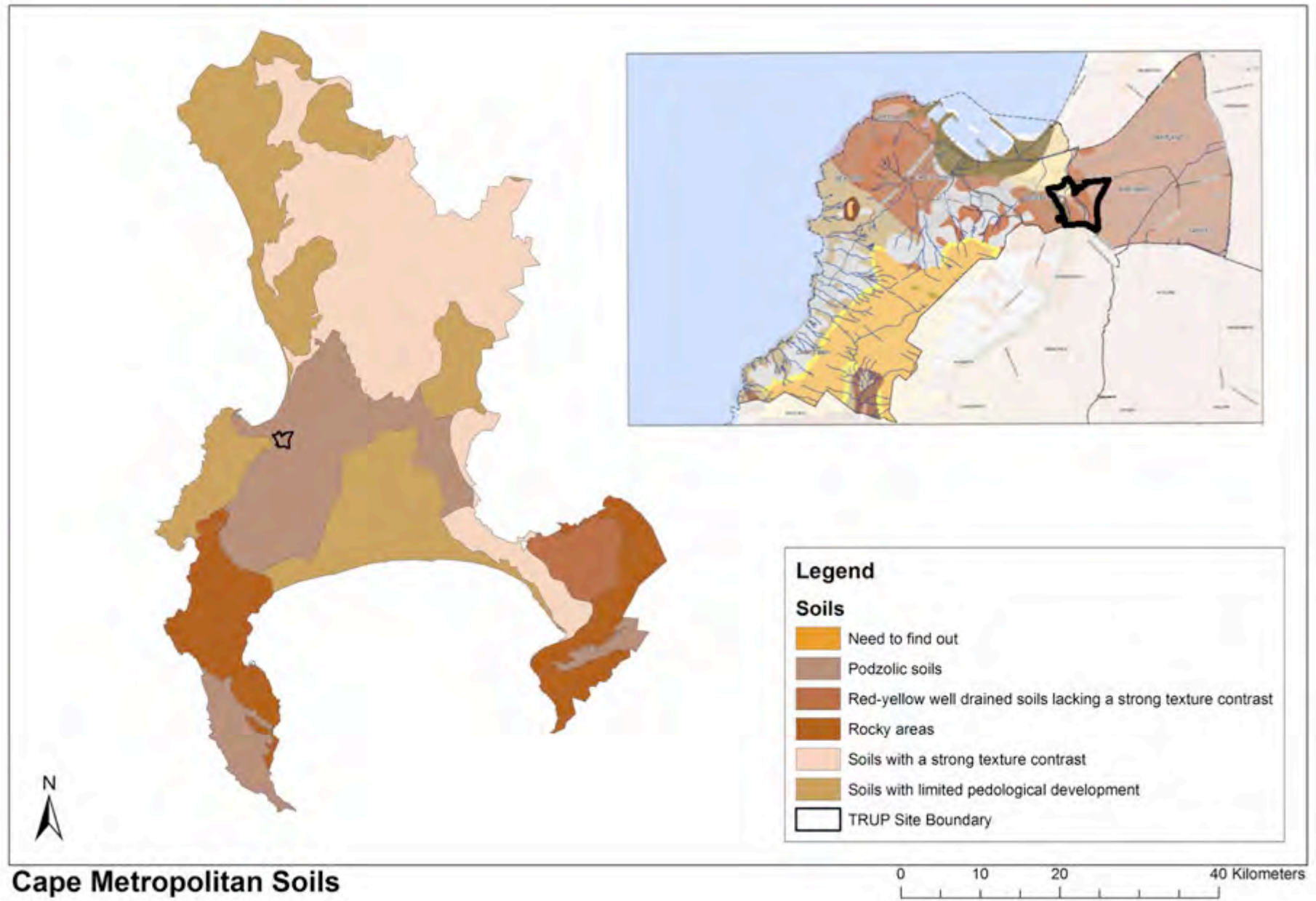
The study area is situated in the Southern Hemisphere, where the sun rises in the east and sets in the west. This has implications for building design and orientation as north facing buildings will collect the most natural light and heat.

### 3.5.2.3 Soil and Geology

Figure 38 show the soil and geology of the TRUP site, within

its district context respectively. The soils are generally sandy, as is the geology, on either side of the river systems. It is the same soil and geology type as most of the CBD and Greenpoint, which means it is capable of supporting development, as well as a range of indigenous plant species, such as renosterveld. As shown in the CoCT metropolitan area map in figure 38, the soils on the site are podzolic soils. Podzolic soils are forested soils found primarily on sandy deposits in ecozones (or parts of ecozones) where the mean annual precipitation is above 700 mm. Coniferous-dominated plant communities are the major vegetation type found on Podzolic soils.

Figure 38: Soil and Geology of the TRUP site within its District and Metropolitan Context (Source: Author, 2016 & TBSDFEMF, 2012)



### 3.5.2.4 Movement Systems: Access

The current movement systems, by hierarchy of route type, are shown in figure 39. The current road network, in its broader context is shown in figure 40. It is apparent that although there are significant transport routes which come into contact with the site, they do not facilitate sufficient access to the site. The N2 and M5 freeways border the site and run through it from north to south. They create hard barriers to access (Shown in figure 41). Additionally, the rail infrastructure, shown in figure 41, creates a barrier to access for the site along the eastern and northern edges. Because of these transport infrastructure barriers, access and permeability of the site is compromised between and through it and its neighboring neighborhoods. This needs to be addressed if the site is to become a catalyst for metropolitan linkage and integration. This integration should facilitate more east-west linkages across and through the site in order to link the surrounding neighborhoods and foster permeability, access, and integration.

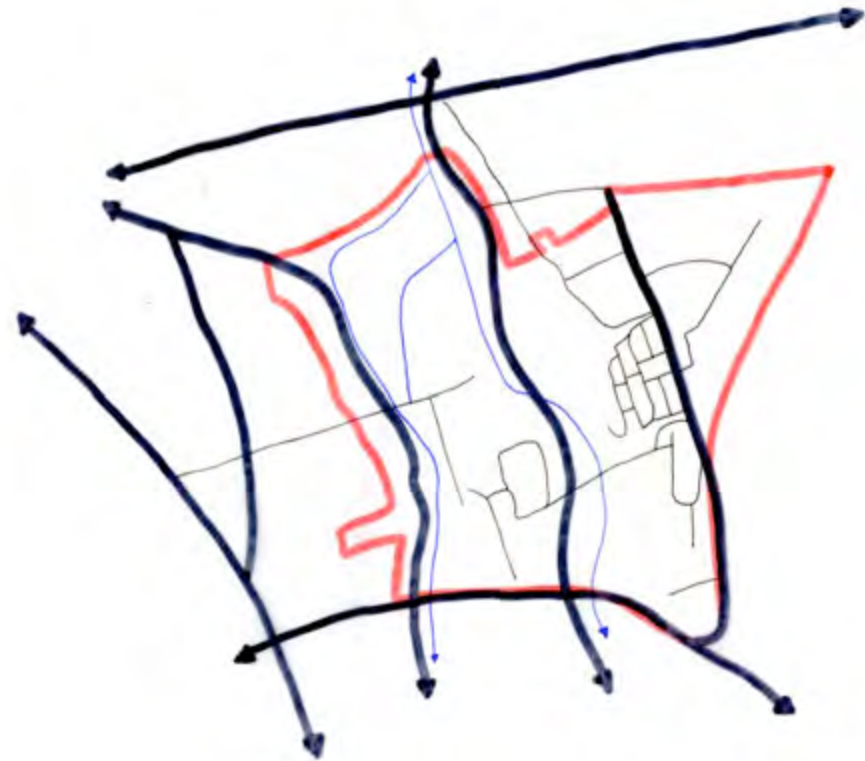
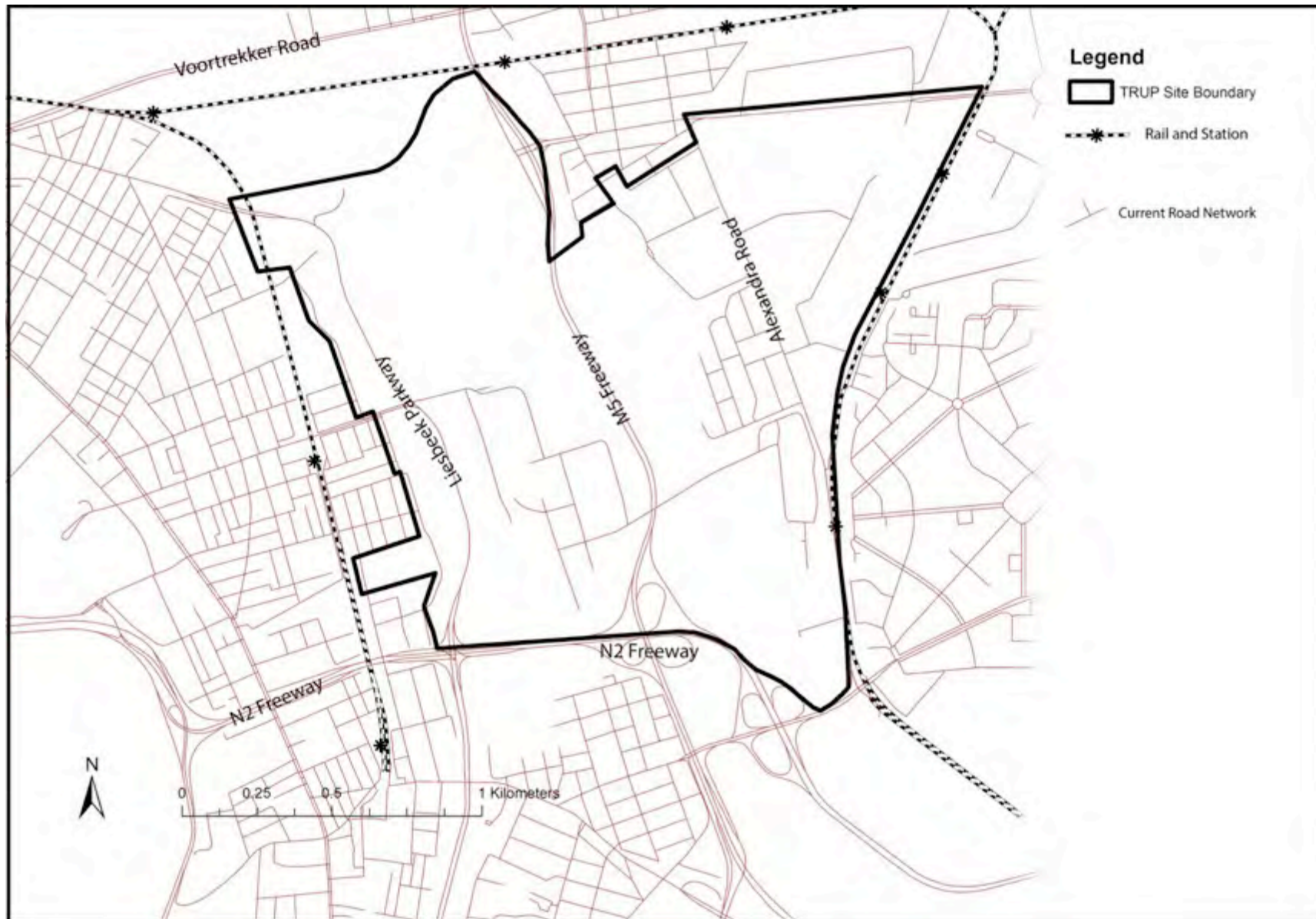


Figure 39: Hierarchy of Movement Systems (Source: Author, 2016)

Figure 40: Current Road Network (Source: Author, 2016 & GIS, University of Cape Town Technical Library, 2016)



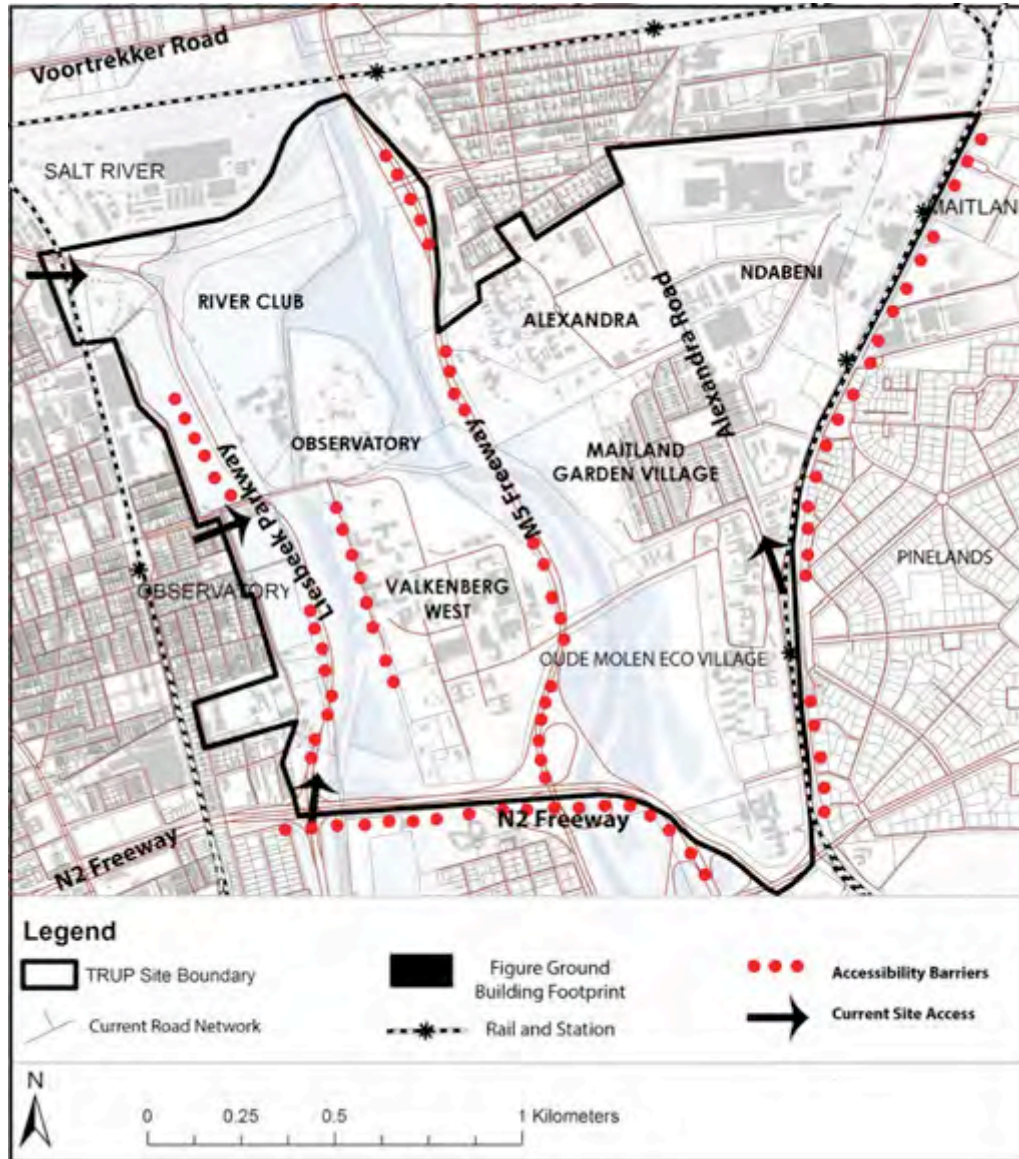


Figure 41: Barriers to Access (Source: Author, 2016)

There is limited access to the site, shown in figure 41.

Additionally, there is very little provision for non-motorized forms of transport (NMT) and the barriers to entry hinder friendly pedestrian and NMT access further. According to the CFMP (2003), if any further development is to take place on the site, significant transport route upgrades are necessary, specifically along Alexandra Road, the Liesbeek Parkway, and Berkley Road, with their associated intersections. There is also a large push, because of the infrastructure cost constraints, to facilitate NMT transport through establishing new routes.

### 3.5.2.5 Green Network and Public Open Space Analysis

The Metropolitan Open Space Strategy (MOSS) (2007) ensures that all open space types of value form a single open space system. The linking of public open green spaces into a single system throughout the metropolitan area is the priority of this strategy. Additionally, this strategy links areas of biodiversity to each other, in order to ensure a continuous natural habitat. Since the TRUP site includes a large area of open space, as well as valuable biodiversity, this strategy is relevant to this research. Important features of this strategy include multi-use and place-making and the idea that metropolitan systems needs to be ecologically, socially, & economically

sustainable. The idea of an open space system throughout the metropolitan area is reinforced by the Biodiversity Network Draft (2010), which stresses the uniqueness and irreplaceability of the natural environment and sets minimum standards for biodiversity protection along national target areas. The draft makes recommendations for the maintenance of systems through biodiversity offsets if network sites are developed. However, it aims to protect network biodiversity sites in order to maintain ecological continuity throughout the city. The TRUP site forms an important part in this linked network of green open space infrastructure, which runs continuously from Table Bay to False Bay. It is therefore important that the open space is properly maintained and of a good quality for urban ecosystems to flourish. As such, it is a catalytic site for urban ecology, green infrastructure, and ecological planning to be integrated into the spatial development plan for the site. It also has the potential to be a positive, recreational space for active and passive recreation (CoCT, 2003). In light of the above, it is imperative to conserve these natural areas and the habitats they support. This can be achieved, according to the CoCT (2003), partly by identifying appropriate land uses, development parcels, design guidelines and movement routes within and on the edge of the Park, but also requires management actions aimed at protecting and rehabilitating the natural areas, providing recreational amenities and addressing issues such as safety

and construction. The MOSS is shown conceptually in figure 42 and accurately, in relation to the site, in figure 43.



Figure 42:  
Conceptual  
Metropolitan Open  
Space System  
(Source: CoCT SDF,  
2012)

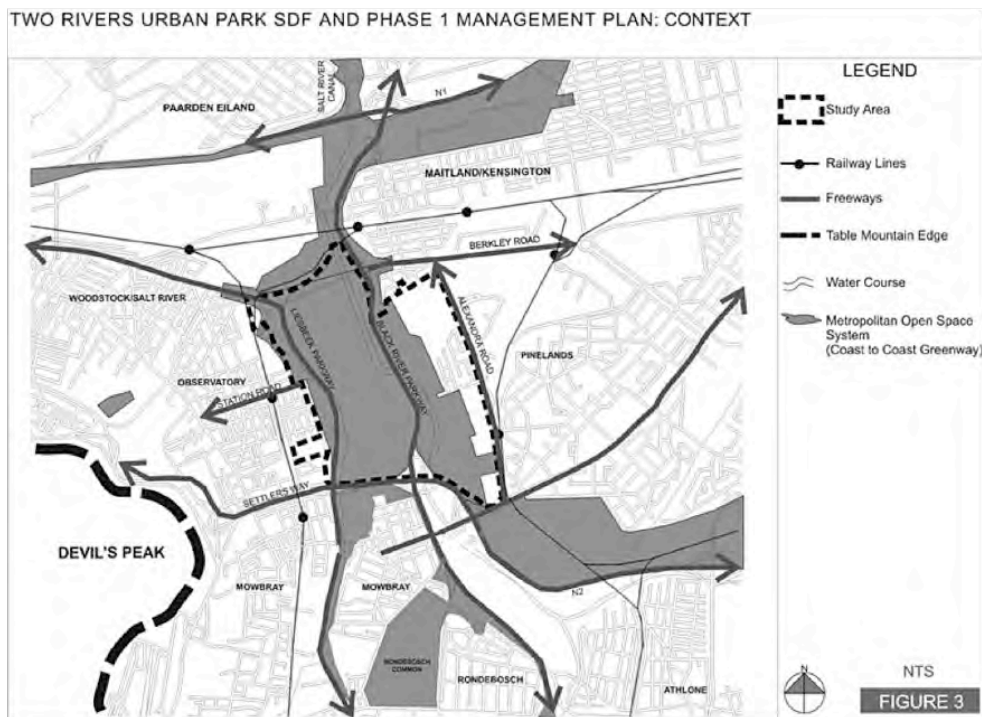


Figure 43: Metropolitan Open Space System in relation to the Site (Source: CFMP, 2003)

### 3.6 Understanding the Area

This section of the analysis tries to understand the site in terms of its main characteristics and features. It explores the site from a number of spatial viewpoints.

#### 3.6.1 Landscape Character Analysis and Sense of Place

The landscape character of the area, informed by the author's experience on a site visit, as well as the notes from the current public participation process, and previous studies and documents for the site (such as the Baseline Heritage Study), is one of great potential. The site is rich in a tangible sense of culture and heritage. The buildings on the site exhibit the history and age of the architecture and tell a story of a different time in South Africa's past. The site seems derelict and underutilized, despite its natural beauty. Table Mountain, Lion's Head, and Devil's Peak are all visible from the site, creating extraordinary views. There is a natural beauty and aesthetic to the site, due to the fact that the rivers seem to enclose certain areas. There are wide open spaces, with rolling lawns. There is also a sense of hard barriers to movement in certain areas on the site. Some areas seem harsh and hostile and disrupt the natural flow of the site. There is a strong sense, however, of culture and heritage and the sense of recreational enjoyment being on the site. There seem to be very few people living

on or using the site. Pollution and waste litter the site and speak of its lack of effective management. The vast potential of the site seems unrealized.

### 3.6.2 Land Use and Zoning

The current land uses, identified by CTS in 2012, are shown in figure 44. The new Cape Town Integrated Zoning Scheme (2012) proposes new use zones for the provincial properties within TRUP and it also proposes an extended Heritage Overlay Zone. The TRUP area falls within the proposed extended Heritage Overlay Zone and will therefore be subject to further requirements in addition to the national legislation. The zoning for the TRUP site, according to the Integrated Zoning Scheme, is shown in figure 45. Zoning is a tool to confer development rights on different land parcels to strategically guide development. As such, a close examination of new possible zoning to allow for the visions enshrined in many of the development proposals for the area is encouraged and proposed in the following chapter of this dissertation.



Figure 44: Current Land Uses (Source: CTS, 2012)

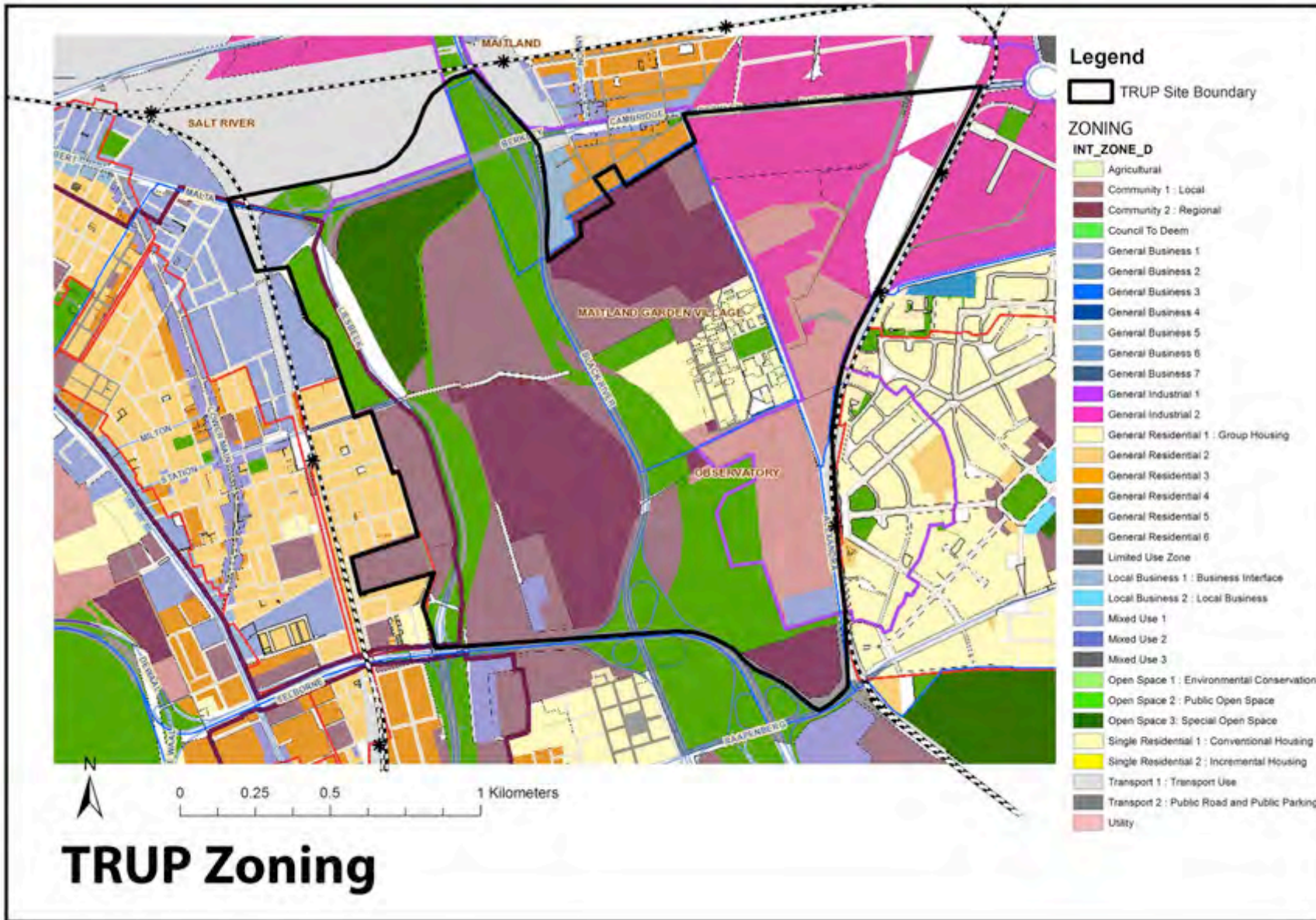


Figure 45: Current Zoning (Source: Author, 2016 & GIS, University of Cape Town Technical Library, 2016, Cape Town Integrated Zoning Scheme, 2012)

### 3.6.3 Land Ownership and Activities

There are significant public land holdings within the site. The Western Cape Government, the CoCT, the South African Rail Commuter Corporation (SARCC), and Transnet are some of the major property owners of larger tracts of land in the TRUP local area. According to City Think Space (CTS) (2012), the Western Cape Government owns several properties within the 2003 TRUP Contextual Framework boundary, namely Oude Molen (Valkenberg East), the Alexandra Institute, the Valkenberg Hospital (Valkenberg West) and the Observatory site. The first two of these have been identified as having some redevelopment potential and are the focus of the WCPG's development interest. It also owns the Biovac Institute.

The City of Cape Town owns a number of properties that are situated outside the original TRUP Contextual Framework (2003) boundary, but which are included in the site boundary as of CTS's 2012 policy. This includes the significant Maitland Abattoir site as well as a number of surrounding land parcels. The city also owns significant land in the Ndabeni area.

Transnet owns the river club site. The South African rail Commuter Corporation (SARCC) owns land at and around the seven railway stations. Figure 46 shows the different land ownership in relation to the TRUP site, as per the new boundary established by CTS in 2012.

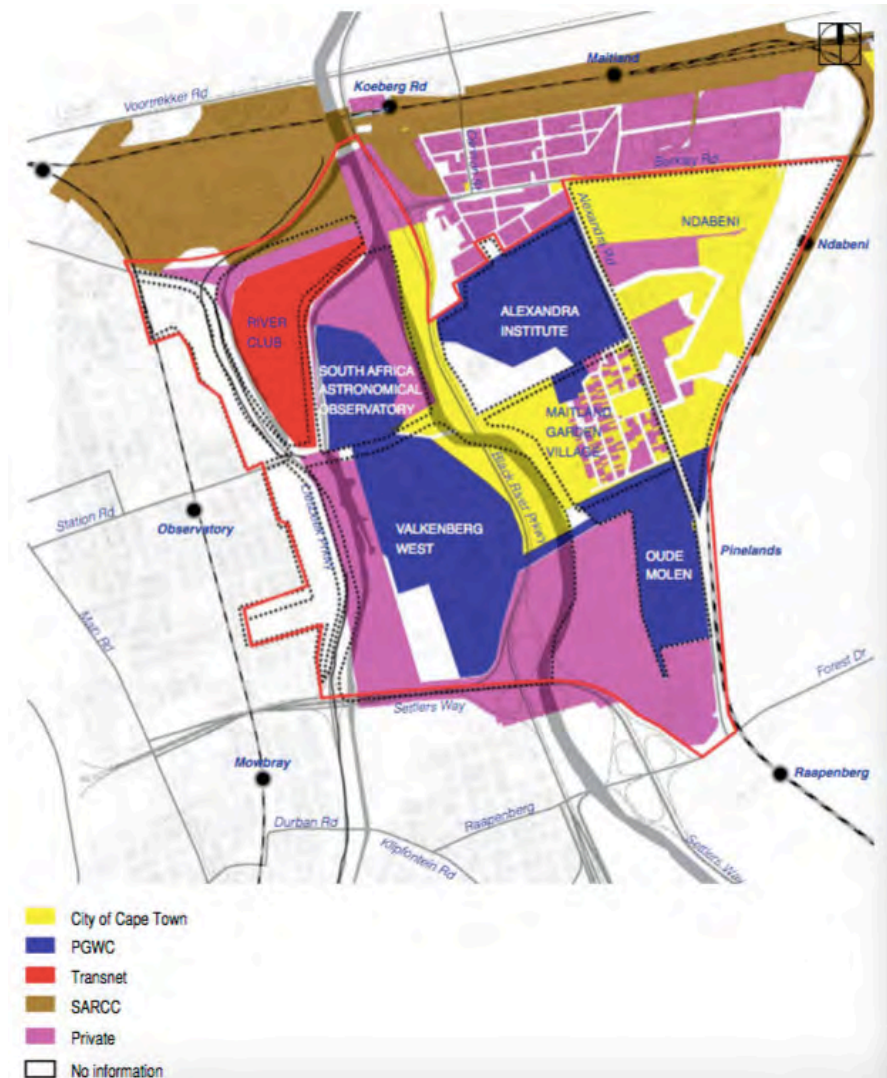


Figure 46: Current Land Ownership (Source: CTS, 2012)

### 3.6.4 Infrastructure

Despite its huge metropolitan and regional potential, the TRUP site is currently poorly integrated into the Cape Town urban area. It exhibits Apartheid-type planning in the sense that infrastructure, in the form of freeways and enclosed private spaces as barriers to entry and fragmentation tools for the city. Additionally, the site forms part of an Apartheid buffer zone, used to separate the affluent areas of the city from the Cape Flats and more impoverished areas. As a result, the current effects of this reality are evidenced in the lack of integration, through infrastructure developments, between the site and the rest of the city.

Many planning and development proposals for the site have grappled with this issue around access. However, most previous attempts to improve access across and through the site, have been met with heavy critique. This is due to the fact that the costs of necessary infrastructure and road capacity upgrades are simply too high (CTS, 2012). A pre-feasibility study undertaken by the CoCT in 1999 attempted to determine the feasibility of development proposed by the Black River Urban Park Spatial Development Framework (1999). The study tested the proposed development yield against the infrastructure capacity and provided a cost-benefit analysis. Furthermore, the development bulk and associated traffic

generation was tested against existing infrastructure and road access capacities respectively.

The results of these tests found that the proposed development could not yield sufficient income to cover the costs of the required infrastructure and road capacity upgrades, with a cost deficit of R79400000 (CTS, 2012). These findings rendered the development proposal unviable and unfeasible. In 2011, an updated baseline infrastructure study was conducted, which confirmed the above findings. The infrastructure cost and capacity restraints were still relevant, despite some service upgrades since 1999 (CTS, 2012).

However, it is important to note that the viability of the development, and subsequent infrastructure costings, were based on conventional infrastructure technologies and transport infrastructure was measured against automobile demand and parking standards. It did not consider alternative, innovative, or "greener" infrastructure models as possibilities, or less reliance on the automobile and its associated infrastructure. Arcus Gibb was commissioned, in 2011, to review the infrastructure baseline study. They evaluated the sewerage, water supply, telecommunications, electrical, rail, and road capacities serving the area. His key findings, summarized by CTS (2012:15) were as follows:

- Water and telecommunications supplies have some capacity to support additional development.
- 100 l/s is still available within the main along Alexandra Road serving the area. Only 30-45% of the current stormwater infrastructure can accommodate a 1 in 2 year and 1 in 5 year storm event.
- Sewerage capacity is extremely limited only because of the pipe just downstream of the recent upgrade between berkley road and the m5. An upgrade to the bypass pipeline to the Mitchell's Plain works, which caters for excess wastewater at the Athlone facility, is underway and will be completed by 2014.
- Major road infrastructure capacity problems were identified, primarily the capacity of the Berkley Road and Raapenberg Road intersections providing access onto Alexandra Road and the provision of additional lanes on Alexandra Road.
- Additional water pressure will be required to service buildings over 4 floors high
- The capacity of the Paarden Eiland Water booster Pump station is becoming limited and should be upgraded in the near future.
- There is spare capacity in the rail system and all other public transport modes

In 2012, Gibb was again commissioned to evaluate the infrastructure capacity implications for CTS's (2012) Spatial Development Framework. The findings indicated that the

infrastructure cost and capacity shortfalls were, using conventional infrastructure models, the same or more severe than those found in 2011 in evaluating the 1999 Black River Park Pre-Feasibility Study. In an interview with Tamsin Faragher, a Principle Professional Officer in the Development Facilitation Unit (DFU) at the City of Cape Town, the interviewee (2016) emphasized the value of the rail and station infrastructure on the site. She argued that although any development, in the past, has been deemed unviable and unfeasible on the site, due to the infrastructure costs, the extension of the site boundary to include Ndabeni creates the preconditions for a possible work-play-live environment. As a result, the possibility of utilizing rail infrastructure and non-motorized transport forms is more feasible. This means that the development potential of the site is made possible through innovative approaches to transport, proximity to opportunities, and green infrastructure planning.

### 3.6.5 Institutions and Social Services

The TRUP site, according to CTS (2012), is well located in terms of social facilities such as health and education, retail, industrial, and community services. Although these are located in close proximity to site development opportunities, there is difficulty, in some instances, in accessing these facilities, due to barriers and hard edges on the site. Public and social facilities are shown in figure 47, as well as access to work opportunities and amenities.

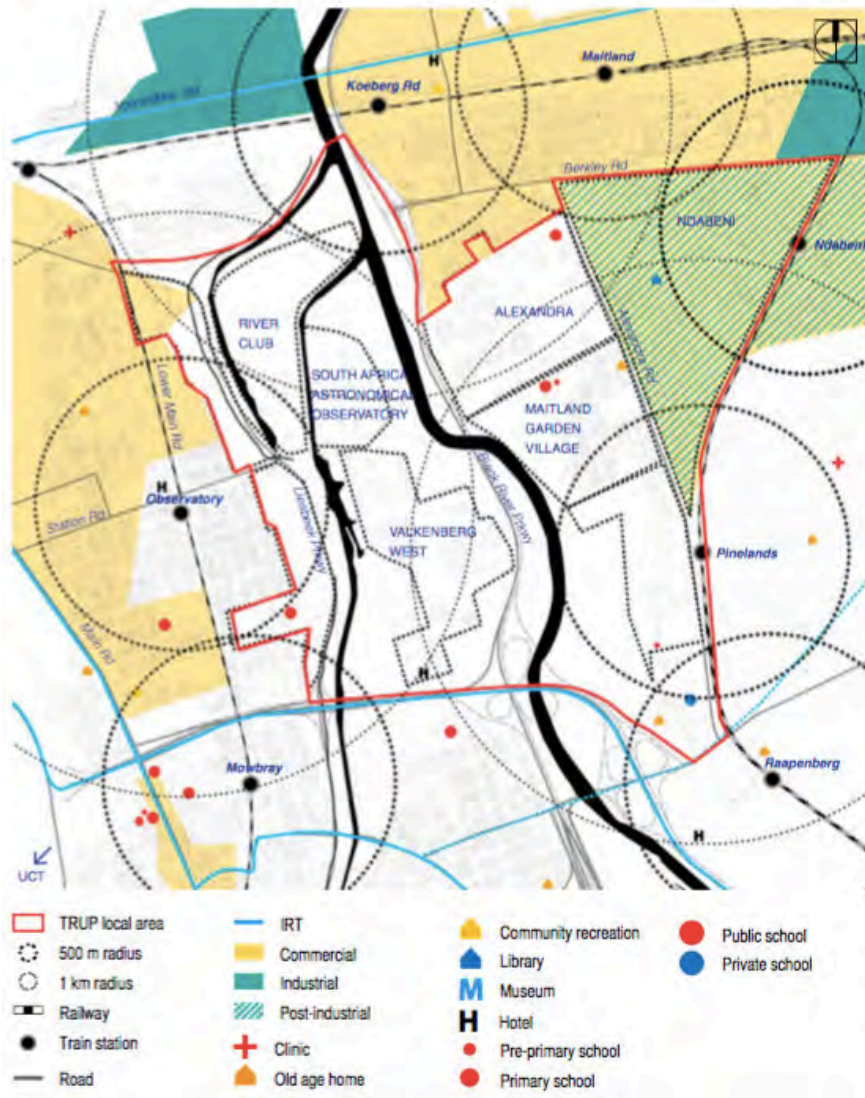


Figure 47: Accessibility of Public and Social Facilities (Source: CTS, 2012)

### 3.6.6 Structural Elements

There are a number of structural elements identified by the CoCT (2003) in the TRUP Contextual Framework and Phase 1 Management Plan. These are shown in figure 48. These include urban edges, floodplains, buildings of heritage significance, mature trees to be retained, and points of entry to the site.

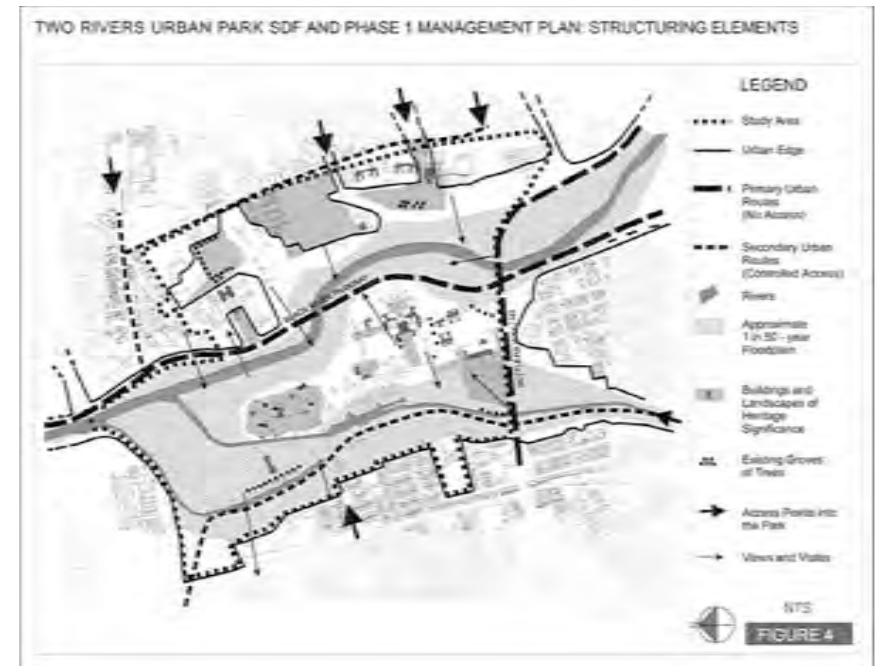


Figure 48: Current Structural Elements (CFMP, 2003)

### 3.6.7 Cadastral and Building Layout

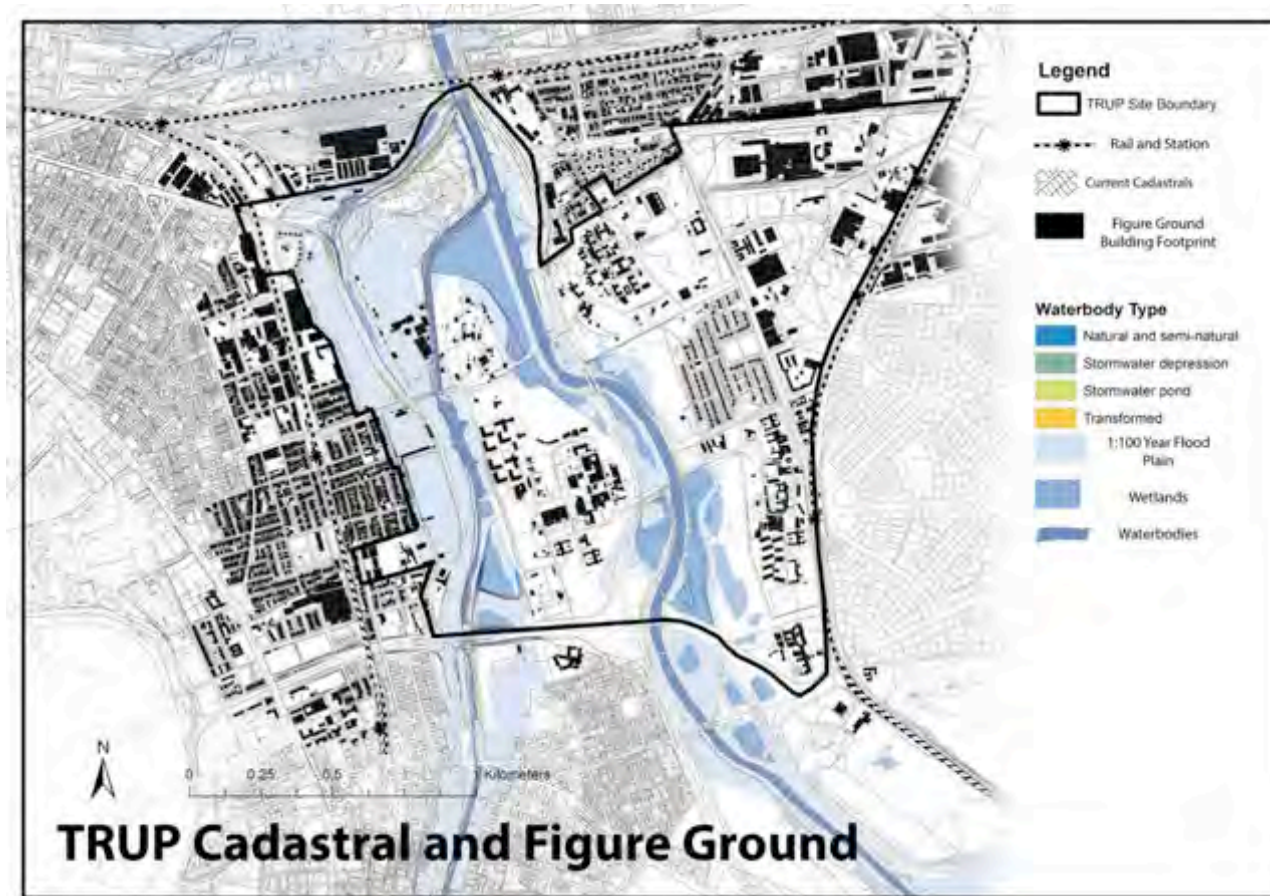


Figure 49: Cadastral Layout and Figure Ground (Source: Author, 2016 & GIS, University of Cape Town Technical Library, 2016)

Figure 49 shows the tissue studies, which characterize the TRUP site and its surroundings, in terms of the cadastral layout and building footprint (shown in figure ground). It

shows that a fine-grained, relatively dense building footprint exists on the west side of the site in Observatory.

The site, however, contains low-density development, which is sporadically spaced. Cadastral sizes all around the site are relatively small in comparison to the cadastral sizes on the site. This is due to the fact that large landowners are yet to subdivide and develop their landholdings on the site. The grain of the building footprint of the site is very spaced out and minimal at present.

### 3.6.8 Significant Natural Elements

The natural elements together define the form and extent of the Parkland, the variety of uses, intensity of activities, and constraints to development (CoCT, 2003). The natural structuring elements (shown in figure 50) comprise:

- The Black and Liesbeek Rivers and associated wetlands, i.e. Raapenberg, Pallotti and Valkenberg wetlands.
- The 1 in 50-year floodplain.

- The topography of the landscape, in essence the river valleys and middle ridges which spatially divide the Park.
- Trees which act as structuring elements in the landscape.

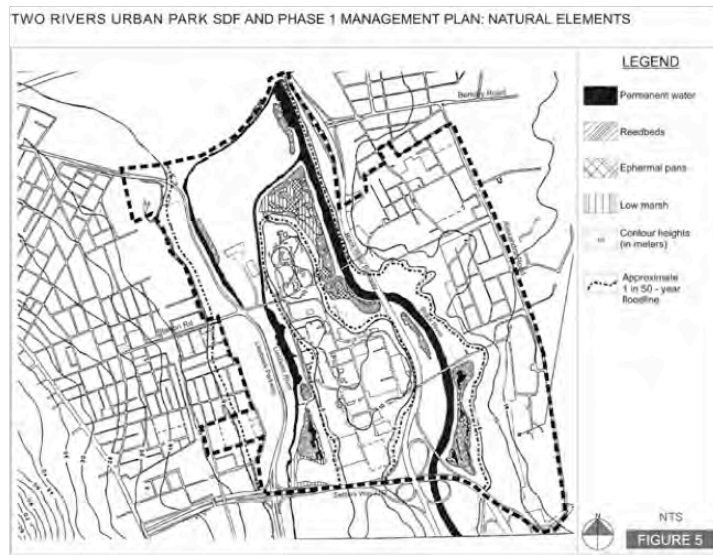


Figure 50: Significant Natural Elements (Source: CFMP, 2003)

### 3.6.9 Precinct Analysis: Parts of the Whole

There are a number of precinct identified by the CoCT in 2003. These are shown and explained, in terms of their characters, in figure 51. They include:

Valkenberg East- Also known as Oude Molen Eco-Village

Valkenberg West- contains the Valkenberg Hospital, a hotel, and a restaurant.

Alexandra- Contains the Alexandra military base Hospital and the Neuwe Molen Mill.

Oude Molen Ecovillage- Inhabitants inhabit the old buildings of the Valkenberg East Hospital. The residents practice permaculture and have formed an eco-village, in line with their vision for the site.

Ndabeni- Largely Industrial area, which is sparsely inhabited.

The River Club- Heritage building and golf course. Contains the Observatory.

Maitland Garden Village- Garden village, similar to Pinelands. Low-density housing.

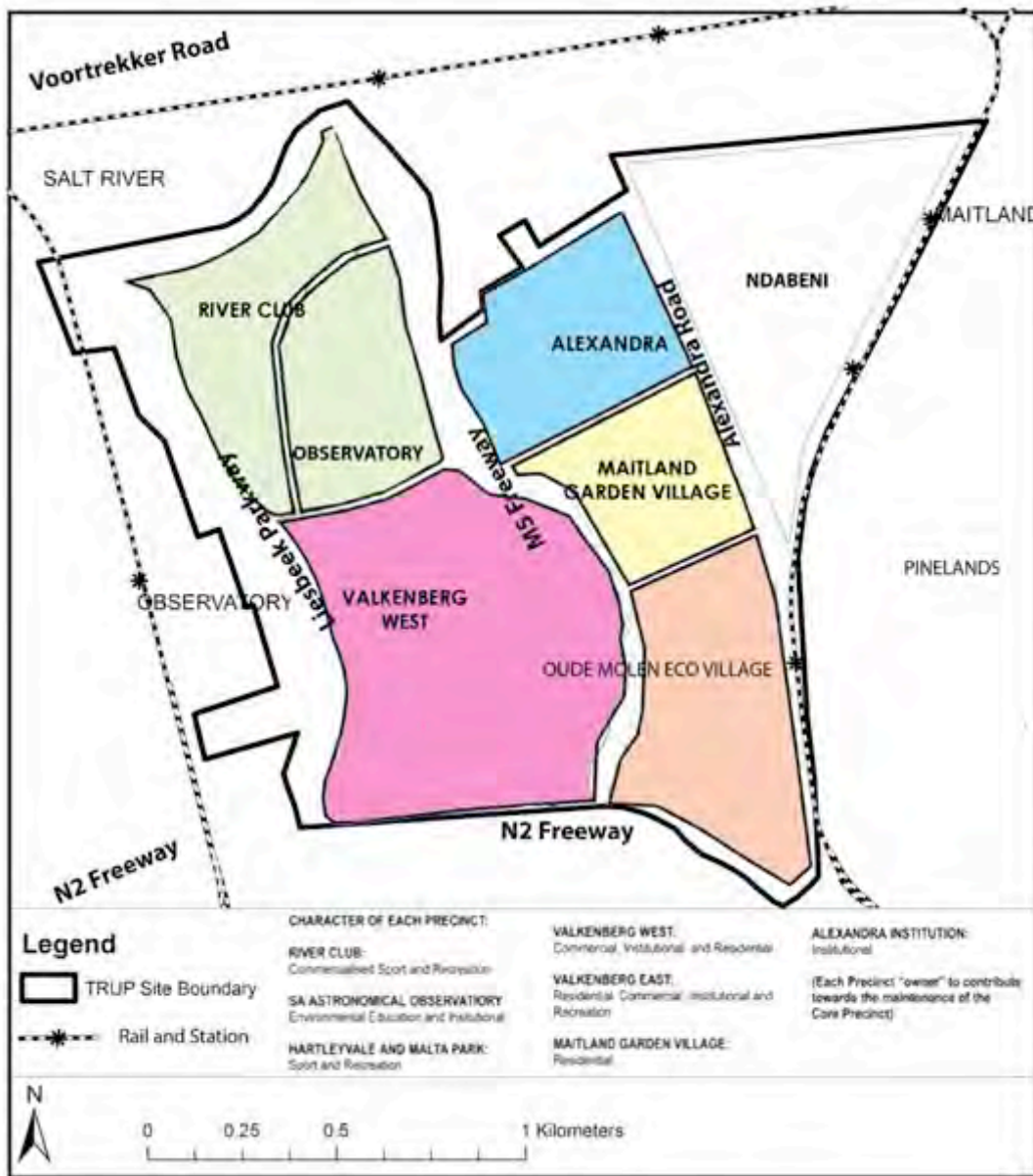


Figure 51: Precincts on the TRUP Site (Source: Author, 2016 & GIS, University of Cape Town Technical Library, 2016)

At a different scale, it is important to note that essentially three planning processes have been undertaken for the Oude Molen Precinct to date:

- A Conceptual Development Framework (2000) which was not approved as the rezoning process was halted;
- A strategic development approach for oude molen (2005) (approved by mec); and
- A Draft Scenario Evaluation Report: Oude Molen Sustainable Neighbourhood (2007), including an environmental scoping report

Furthermore, detailed precinct planning has begun for the other precincts on the site, through stakeholder presentations, as part of the current public participation process, according to the honors students in the University of Cape Town's City and Regional Planning class (2016).

### 3.7 Trends and Key Strategic Considerations

In summarizing the analysis outlined in this chapter, a number of key considerations are apparent as follows.

#### 3.7.1 Key Development Issues for Consideration

According to CTS (2012), the major challenges to

development include the state of the river and the pollution of the river, along with tensions and competing demands relating to the oude molen precinct. Furthermore, while the TRUP local area is well located within the metropolitan area and is within 1km of seven stations and the activity corridors of Main Road and Voortrekker Road, the river, freeways and Valkenberg security perimeter present major barriers to access to these, and to the site as a whole. When asked what the scope was for low-income housing on the site, NM Associates (2016) noted that the "Not In My Back Yard" (NIMBY) principle was relevant as some of the major stakeholders, through the public participation process, did not want low-income development on their doorsteps. They further stated that one of the biggest development challenges is getting all of the major stakeholders and landowners to commit to a common goal and vision for the site, and to buy-in to the idea of development which is sensitive to the environment. This idea, according to a Cape Higher Education Consortium (CHEC) Steering Committee member (anonymous) interviewed for this research (2016), is difficult for private developers to agree on, due to the fact that private development generally aims to maximize profit through intensive development, with environmental considerations as inferior priorities. He/she stated that although environmental law is stricter than development law, it is poorly enforced.

This Steering Committee member, who preferred to remain anonymous, spoke about CHEC as being a valuable tool in guiding academic and research considerations for the site, and engaging the higher education facilities in the Western Cape in order to steer the development. According to the interviewee (2016), one of the biggest shortfalls of the current process is the fact that he/she believes that the current public participation process is a means by which the city and province can simply "check boxes," having already decided on the preferred development option prior to the process: high intensity and dense development, even if it is at the expense of the natural environment. Additionally, he/she felt as though the end users of the planning process, the supposed 20000 or so people who will be accommodated on the site, had not been properly identified or represented.

### 3.7.2 Key Environmental Impact Considerations

The state of the environment on the site is evidently in need of attention and improvement. The polluted rivers and wetlands are not, at present, conducive to development or use. Urbanization and increasing urban development continue to threaten these natural systems. Development pressures for high-density and intensive development threaten these systems further (NM Associates, 2016). According to Nm Associates (2016), achieving a balance between development needs and the ecological sensitivity

of the site is key to realizing its full potential. It is often the tendency of spatial planning to keep people and development out of these areas, in a way which sees conservation as incompatible with development, thereby further fragmenting human-nature relationships. This tendency favors the creation of boundaries between development and natural systems. This site offers exciting opportunities to engage with this issue and rethink human-nature relationships in terms of protecting and enhancing natural and human systems.

According to the anonymous Steering Committee member, no previous policies or plans for the site have even considered the possibility of no development, or limited development, in order to enhance the intrinsic environmental value of the site. As such, he/she believes that this option should be considered in future proposals. He/she further argues that the city should have acquired the land many years ago, before any proposals for the site were done, in order to control and guide development of the site towards sustainable ways of living, with development having a positive effect and impact on nature.

### 3.8 Composite Analysis

A composite analysis of the natural ecological features of the site is shown in figure 52. This figure is an overlay of

various layers used in the above analysis in order to understand the ecological basis and life support system on the site. Figure 53 then shows a composite analysis of all the spatial layers in order to understand the site's complexity holistically. Essentially, it presents the current status quo of the site. This will form the composite basis for the framework that will follow in the next chapter.



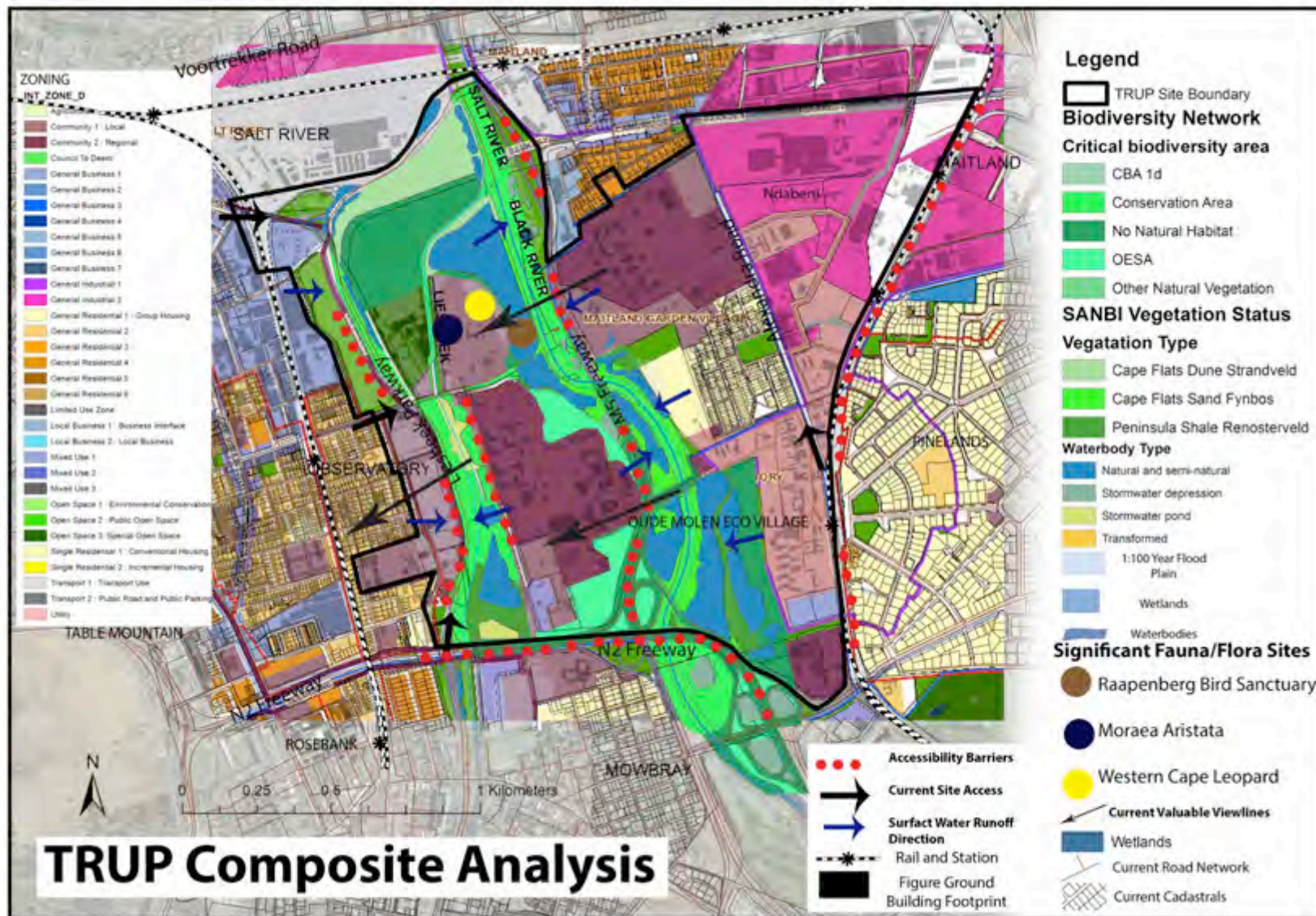


Figure 53: Composite Spatial Analysis (Source: Author, 2016 & GIS, University of Cape Town Technical Library, 2016)

### 3.9 Opportunities and Constraints

From the above analysis, a number of opportunities and constraints to the sustainable development of the TRUP site have become apparent. They include, but are not necessarily limited to the following:

#### 3.9.1 Opportunities

- The Park is highly accessible, i.e. major public transport routes (rail, taxi and bus) exist adjacent to the site.
- Raapenberg Bird Sanctuary and the Pallotti wetlands provide a high diversity and abundance of suitable habitats for water birds and are presently buffered from disturbance. This presents an opportunity to maintain and enhance wetlands and bird habitats, as well as enable better connections between development and natural systems so that development is not a disturbance. There is opportunity to invite people in, rather than separate them from nature, in terms of rethinking conservation and better integrating it into human development processes.
- The old Liesbeek River course could be restored to its natural state and utilised for a variety of recreational activities, such as

boating and fishing, as well as serving the ecological functions of a river. Specialists are to be appointed to provide input into upgrading and rehabilitating a section of the canal downstream of Observatory Road.

- There are panoramic views of Devil's Peak, the rivers and the wetlands.
- Mature groves of trees exist on the site, which contribute to the cultural value of the Park.
- There are a myriad of historic buildings and landscapes as well as important vistas, focal points and archaeological sites, which can provide form and structure to the current open space, and enhance the character of the area.
- There is a significant amount of underutilised land on the edges of the Park and adjacent to existing buildings within the park which could be utilised for development where appropriate.
- Many of the buildings in Valkenberg East are not used for the purposes of Valkenberg Hospital and will soon be released for development. Several buildings within Valkenberg West will also be vacated, thus providing development opportunities and upgrading of existing buildings.

- The variety of land uses within the Park would contribute to its envisaged diversity.
- Urban agriculture is currently being practiced within the Park, and possibilities of extending this practice are feasible.
- According to NM Associates (2016), there is a shift in the property market at present, towards green building, housing, and infrastructure. This shift is in accordance with previous visions for the site and is necessary in order to build a sustainable neighborhood.
- According to Tamsin Faragher (2016), the site offers exciting opportunities to bring together a range of stakeholders and to enable inter-sphere government cooperation and collaboration.
- The site's infrastructure limitations and intrinsic natural resource potential provide opportunities for innovative development approaches which enable sustainable livelihoods and building practices.
- The site has the opportunity to become a natural resource and asset to the city and its residents, as well as provide a range of other services which facilitate a live-work-play environment.
- The site presents opportunities to experiment and test new pilot projects in terms of

sustainable energy, greener building approaches, food production, river corridor management, waste-to-resources, and environmental protection, enhancement, and conservation.

### 3.9.2 Constraints

- Although Raapenberg Bird Sanctuary and the Pallotti wetlands provide a high diversity of suitable habitats for waterbirds, the number of birds is declining as a result of the decrease in bird habitats (CoCT, 2003).
- The floral species in the area are largely alien.
- The Liesbeek River has been canalised and cut off from its original course, resulting in the canalised section functioning purely as a conduit for stormwater, and the old water course remaining stagnant for several months of the year.
- The Black River is highly polluted and not suitable for human contact, and the possibility of restoring it to its natural state is remote as the pollutants originate upstream from a variety of diffuse sources that cannot be controlled by the future management of the Park.
- The possible widening of the Black River to accommodate future runoff from the catchment would negatively impact on the Raapenberg wetlands.

- The wetlands and rivers, as an amenity, are presently inaccessible to the general public as a passive recreational amenity or resource.
- Many of the open space areas are underutilised, not well maintained and poorly defined.
- There are limited recreational facilities.
- There is a lack of identity and defined function, given that the site has not been planned as a whole in the past.
- Many of the historical buildings are in a state of disrepair.
- Land uses and historical buildings within the Park are separated by visually impermeable walls.
- There is little surveillance on a portion of the site, thus threatening the safety of people in this area.
- The site is separated by the Black River Parkway and is only connected via two bridges, one providing limited vehicular and pedestrian access, and the other providing pedestrian access. These bridges are in a state of disrepair.
- A congestion problem exists at the intersection of Station Road and Liesbeek Parkway.
- Little provision has been made for cyclists and pedestrians along Liesbeek Parkway and for cyclists along Alexandra Road.
- There is no additional funding within the Municipality for the wetland areas (CoCT, 2003).
- The full potential of the Park as an environmental education and research centre has not yet been realised, due to institutional and bureaucratic constraints.
- Existing access into the Park is extremely limited, compromising permeability and integration.
- There is uncertainty about the position of the 1 in 50-year flood line. There are attempts underway, according to NM Associates (2016), to better understand the flooding of the river and model it carefully to inform development boundaries.
- The future role of the Valkenberg Hospital is uncertain.
- According to NM Associates (2016), one of the major constraints to any development on the site is the transport and infrastructure capacity, which is inadequate to support further development.
- Access to and permeability across the site are compromised by natural and infrastructure barriers currently.
- Competing interests and private developer interests are a constraint to sustainable development and protection and enhancement of the natural resources on the site.

### 3.10 Conclusion

Having analyzed the TRUP site in terms of its context, main features, structuring elements, and systems, and having identified key issues and considerations and opportunities and constraints, this chapter can be concluded. It is clear that the site presents the unique potential to be a special destination place of interest and a resource for all residents in the city. It can also facilitate development, which should aim to enhance and have a positive impact on the natural environment and key environmental features of the site. It is surprising that the potential of this site is yet to be realized. It is also surprising that, despite numerous policies and plans for the site, which have been in existence for over a decade, no development has taken place yet. The largest surprise, however, is the fact that, given the unique natural character of the site and its infrastructure constraints, previous policies and plans have opted for conventional, intense, high-density development. These constraints are, in fact, incredible opportunities to rethink urbanism and urban development, in a way which enables urban sustainability for the city through ecological planning and positive development. The next chapter, taking this analysis into account, will present a framework for the development of the site in a way which seeks to strengthen links between humans/development and the natural environment.

## Chapter 4: The Framework

### 4.1 Introduction

Having presented a thorough and integrated analysis of the status quo on the site, and of the embedded role of the site in the district, metropolitan, provincial, and national context, this dissertation continues with the development of a SDF to guide development and foster more integrated human-nature relationships on the site. The framework, essentially, is a practical articulation of a paradigm shift towards sustainable and positive development, as defined by the literature review in Chapter 2. The framework will establish a plan for ecological protection and enhancement, as well as for positive development to guide public expenditure and private development towards the achieving of a common vision over a twenty year period (2016-2036). The framework is presented in this chapter, along with the planning approach, vision for the site, key objectives and goals, a spatial concept, and a number of strategic interventions to unlock the potential of the site. The framework aims to establish development and ecological guidelines to inform the site development in a way which seeks to reconnect humans and nature and develop replicable ideas which can be expanded in the city to foster more responsible development, informed primarily by ecological opportunities and constraints. The

purpose of the SDF is to inform decision-making regarding development applications and Environmental Impact Assessments (EIAs) and to guide public and private expenditure towards sustainable urban growth and development. The following chapter will then lay out the implementation plan, and will articulate the ways in which the plan could possibly be effectively implemented.

### 4.2 Relationship Between Spatial and Ecological Planning in the SDF

Because the focus of this dissertation, and subsequently this SDF, is on integrating humans and nature and spatial and ecological planning, the inclusion of ecological strategies and guidelines is necessary within the spatial planning policies and strategies. The EIA regulations promulgated by NEMA provide for the development of EMFs, which are intended to inform planning and environmental management. As a result, the CoCT has integrated an EMF into its district SDFs to ensure that the EMF effectively informs and responds to the spatial planning context. The Table Bay District EMF, shown in figure 36 in chapter 3, is integrated with the Table Bay District Spatial Development Plan. According to the TBSDFEMF (2012: 15), the broad objectives of the EMF are:

- To inform and guide spatial planning in the district;
- To assist in facilitating investment;

- To function as a support mechanism in the environmental impact assessment process in the evaluation and review of development applications, as well as making strategic informed decisions regarding land use planning applications (as an integral part of the district plan);
- To guide sustainable development in the area and determine the environmental management priorities; and
- To provide support to the process of delineating geographical areas within which specified activities are to be identified (or excluded from those listed) in terms of NEMA based on sensitivity of the environment to the potential impacts.

The TBEMF (2012) is developed as an input to the SDF, with some overlapping components. For the purposes of this SDF, strategies and interventions will be guided by the District EMF and SDF. This will ensure alignment between plans at different scales. While this SDF will not explicitly contain its own EMF for the TRUP site, its planning interventions will draw down from the District EMF. In this way, ecological and environmental planning will be integrated into the spatial planning development process. Furthermore, similarly to the TBSDFEMF (2012), the strategies and interventions in this SDF are developed, in their very nature, to reflect the “desired state of the environment,” thereby fulfilling the requirements for components of an EMF

in terms of NEMA. In this way, not only will environmental and ecological strategies be integrated as a component of the SDF, but they will be embedded within spatial planning strategies and interventions, acknowledging and echoing the inseparability of the two as a single socio-ecological system.

### 4.3 Approach

This section articulates the main features of the approach to the development of this framework.

#### 4.3.1 Wholism

The approach to undertaking the development of this framework echoes the approach articulated in the literature review of this dissertation. The approach is one of holism, whereby the framework seeks to integrate ecological and spatial planning holistically. In this way, the approach seeks to align land use with the intrinsic ecological and environmental attributes of the site, in a way which is beneficial to the city as a whole, through green infrastructure development, sustainability, ecological planning, and urban ecology principles, in order to enable more integrated human-nature relationships. Furthermore, again echoing the literature review of this dissertation, the approach to the development of this SDF is one which seeks to challenge some of the conventional and

anthropocentric policy and development norms and the unsustainable paradigms discussed in the literature review (Chapter 2). In this way, the approach is radical and transformative, aiming to transform a site, that is otherwise lost space, through innovative low-positive impact development.

#### 4.3.2 Balance

This framework is approached in a balanced way. This means that the approach aims to balance social and environmental considerations in a socio-ecological systems approach to local area settlement design and planning. This approach acknowledges that human and natural systems are embedded in each other in the city and cannot be separated. As such, the two should be balanced and integrally planned to ensure the well-being of the socio-ecological system as a whole. This approach is also in line with the attempt to better integrate ecological and environmental planning considerations in spatial planning at this local area scale. In this way, the framework prioritizes neither development or conservation separately. Instead, it seeks to enable a balance between the two. The balance is between the need for compaction, densification, and mixed-use development and ecological imperatives, enhancement, protection, and integration.



(Source: <http://gnhre.org/gnhre-symposia/>)

#### 4.4 Vision

The articulation of a strong vision for the development of the site is essential in understanding that the framework provides policy guidance for the process of achieving the vision. Furthermore, the vision articulates a desired state which the framework will unpack and aim to achieve. As such, the vision for the redevelopment of the TRUP site is as follows:

A vibrant and accessible “green” neighborhood which challenges unsustainable development norms by modeling good-practice, replicable ideas with a conscious regard for strengthening human-nature relationships and where intentional socio-ecological communities and livelihoods can thrive within the city of Cape Town.



(Source: <http://inhabitat.com/nyc/mayor-bloomberg-announces-plan-for-willets-point-queens-to-be-revamped-into-new-green-neighborhood/>)

The vision capitalizes on the sustainable types of activities that already exist in the precinct. The expansion of these activities, namely socio-ecological sustainability, designing for and living with nature, emulating natural eco-systems, conscious attempts to integrate humans and nature, and eco-village initiatives, will see the design of a dense, compact, and mixed-use neighborhood which is designed predominantly for pedestrians and provides NMT and

extensive public transport routes. This neighborhood will become a fully functioning sustainable neighborhood in which a range of agricultural initiatives will be implemented in order to integrate agriculture and sustainable living and infrastructures into the daily lives of residents who can enjoy a live, play, work environment. This precinct will become a nationwide and worldwide model for sustainable development, testing a variety of ways of living and working sustainably and a range of different public-private partnerships. The development is to be carefully managed in order to maintain a common theme of sustainability and socio-ecological consciousness building. As a result, building materials and infrastructure systems will respond to this.

#### 4.5 Desired State of the Environment

In order to further develop the vision for the site, it is necessary to state the desired state of the environment upfront, in order to set a target for the development of the site to respond to and for applications on the site to be evaluated against. This desired state of the environment also articulates a basis for approaching the development of spatial concepts and subsequent strategies which are central to the framework. As such, the desired state of the environment is:

A clean, healthy, safe, and enhanced environment where ecologically conscious ways of life can thrive as connected communities, developed through flexible but enabling strategic investment, and where social, ecological, environmental, political, and economic transformation is encouraged and displayed.

The natural environment should be restored, rehabilitated, protected, and enhanced through positive development and should form an integral part of the lives of residents, through an ecological way of seeing the world which exhibits responsibility in terms of reducing carbon and urban footprints. In this way, the natural environment should be of the highest quality in order to exhibit tangible successes in moving towards a paradigm shift in the way humans live with nature. In this way, a positive environment will be strived for, which seeks to enhance quality of life for existing and new residents.

Finally, the desired state of the environment is one whereby development and nature are well-balanced and are not polarized or seen as competing. Development and human activities should seek to actively and consciously integrate nature and vis a versa, with no negative impacts on either. In this way, vibrant and healthy lifestyles are promoted and choice and diversity are maximized.

## 4.6 Values and Principles

This section articulates a set of values and principles which underpin the strategic interventions and framework development. These values and principles, though broad in their nature, will be contextualized to the scale of the TRUP site in the strategic interventions section.

### 4.6.1 Values

Planning, as a discipline, is based on a strong set of values, which inform both the planner's individual normative position and the values which form the basis of any spatial plan. According to Dewar and Louw (n.d), it is these values, which transform the design process into a rational argument.

The planning framework has the ultimate objective of sustainable urban development for the TRUP local area in terms of how sustainability is defined and contextualized for this research in the literature review of this dissertation (Chapter 2). The different dimensions of the sustainability model presented and discussed below are articulated as core values, which underpin the development of this SDF. Previous assumptions believed that development needs to balance economic, social and economic needs simultaneously. This is also known as the triple bottom line (shown in figure 54). This model of sustainable development

has, however, experienced considerable criticism (Pieterse, 2010).

According to Botha (2015), a major weakness of this model is that it assumes that the economy, society and environment are independent of each other and leads to assumptions that trade-offs can be made among the three spheres. The separation of environment, society and economy has led to a techno-centric approach where issues of society and the environment are disregarded (Botha, 2015). It focuses on pollution control, lowering resource use and greenhouse gas trading rather than tackling the deeper issues or seeing the connections between society, economy and the environment (Giddings, Hopwood, O'Brien, 2002). Another problem with this model is that it is too abstract to understand the complexity of how sustainable development transpires at the urban level. Currently, cities in South Africa are not sustainable: urban inhabitants as well as economic activities depend on environmental resources from outside of the city's footprint, further fragmenting human-nature relationships (Allen, 2009).

To understand what sustainability means and how it affects cities, especially at a local scale, requires a more holistic vision of the concept. Environmental, economic and social dimensions still apply but with growing populations in limited space, the built environment also needs to be recognized as a central component of sustainability.

Rather than cities being metropolises for anthropocentric activities, which are often separated from the natural environment, this SDF proposes that cities need to become sites whereby economic, human, and environmental processes meet and connect as parts of a single system. This new model (discussed below) challenges conventional and unsustainable development paradigms and profit-driven, anthropocentric and capitalistic views of development, which are often undertaken at the expense of the natural environment for the purposes of human consumption.



Figure 54: The Triple Bottom Line Model of Sustainable Development (Source: Botha, 2015)

This development framework makes use of the sustainable urban development model developed in the work of Adrian Allen who acknowledges that urban development will only be acceptable and in the public interest if it is economically viable, ecologically justifiable, socially equitable, physically integrated and politically sustainable (Allen, 2009). Allen's concept of sustainable urban development is illustrated in Figure 55. Given the intrinsic ecological quality of the TRUP site, the ecological considerations are considerable. To assess whether any development, policy or trend is moving towards sustainable urban development or against it, it is necessary to consider the relationship amongst the five dimensions that are shown in Figure 55. According to Botha (2015), the outer circle represents the ecological capacity of an urban region and acts as a measure to assess whether interventions in each of the five dimension are moving towards sustainable development. The corners of the square within the circle represent the economic, social, ecological and built environment dimensions while the political dimension articulates them. The political dimension is seen as the regulating mechanism to ensure that all other dimensions remain within the boundary of sustainability. This more holistic view of sustainability challenges our understanding of cities and the multiple impacts they have on society and the environment in the process of urbanization (Allen, 2009).

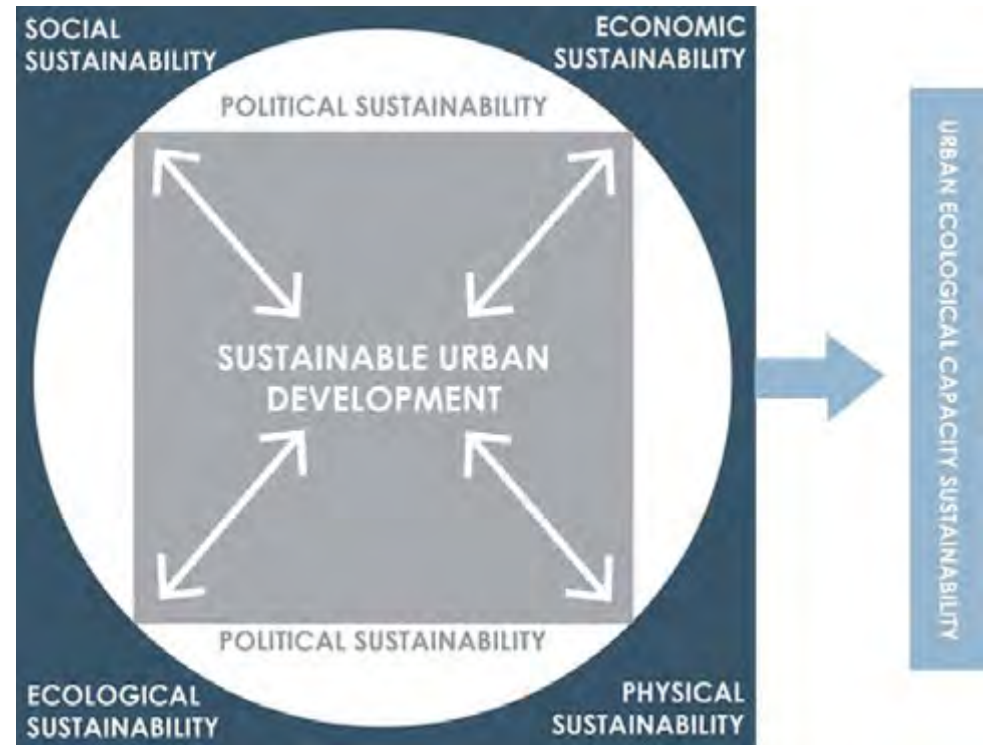


Figure 55: Five Dimensions of Sustainable Urban Development Model (Source: Allen, 2009, adapted by Botha, 2015)

Sustainability, according to Allen's model, includes economic, social, ecological, and physical sustainability dimensions (Figure 55, Allen, 2009), which are described below.

#### Economic Sustainability

The ability of the local economy to sustain itself with less reliance and impact on the natural environment, without

causing irreversible damage to natural resources, and without decreasing the ecological footprint of the city (Allen, 2009).

#### Social Sustainability

The policies and strategies should be aimed at improving the quality of life of all people, particularly those who are more impoverished. Therefore, the policies should value fair access and the equal distribution of opportunities and rights to use the natural and built environment (Allen, 2009).

#### Ecological Sustainability

This refers to the impact of human and urban processes on the natural environment and its carrying capacity. The natural environment should be protected, and enhanced through positive development approaches to ensure the health of the city (Allen, 2009).

#### Physical Sustainability

This refers to the ability of the built environment to support human life effectively and efficiently and enable productive activities, with positive impacts on the natural environment (Allen, 2009).

#### Institutional/Political Sustainability

The successful implementation of any plan is largely reliant on the extent and quality of the governing systems which guide the process. The participation of multiple

stakeholders, and the mediation and integration of these stakeholders needs to be carefully guided and enabled.

The above-mentioned dimensions of sustainability are intrinsically linked and are inseparable. Therefore, an integrated planning approach values the integration of these dimensions, acknowledging that the success of one dimension is dependent on the success of the other dimensions, as part of a single complex system.

A number of key values, developed through the theoretical and conceptual frameworks, as well as the normative statement and which will inform the approach to intervention and strategies are as follows:

Apart from the core value of sustainability, this SDF is informed by a number of other values. These are as follows:

- ✚ Primarily, this SDF values the natural environment. Its presence for aesthetic, health, recreational, and human needs is therefore essential in all aspects of life on the site. It is to form the basis of livelihoods, lifestyles, and development.
- ✚ Strategies are only effective if they impact the lives of the most impoverished. In this way, this SDF is pro-poor.
- ✚ This SDF values bottom-up human development strategies on a micro-level to intervene according to grassroots needs, established through social

movements and conscious community participation processes.

- ✚ This SDF values the importance of the environment and natural systems in sustainability and promotes protection and enhancement.
- ✚ This SDF values access and mobility. In this way, this SDF values the transformation of space. Since the TRUP site was a buffer site in Apartheid between racial groups, with intentional separation through infrastructural barriers, the value of mobility and access seeks to unlock the site's potential and integrate the surrounding suburbs.
- ✚ This SDF values the need for economic, social, and environmental redress of past spatial injustices.
- ✚ This SDF values innovation, diversity, and vibrant community livelihoods.
- ✚ This SDF values conservation and protection of the natural environment and development which responds appropriately.

#### 4.6.2 Principles

A number of key spatial principles will guide the interventions, strategies, and projects in this SDF. The principles are interrelated and support one another. These principles balance population growth, economic growth, urbanization, sustainable urban development as well as other factors in an attempt to establish a new urban system

(UN-HABITAT, 2014), which in this case should be centered around ecological planning to connect humans and nature. These principles will inform the strategies for the development of the site. The development framework is based on the following principles:

#### Ecological Celebration, Enhancement and Emulation



(Source: <http://www.richmondballet.com/2016/04/26/mim-final-performance-2016/>)

This principle promotes the natural environment as a primary feature of any development on the site. Its enhancement should be prioritized. Furthermore, the development of the site should seek to celebrate nature

and bring it into the urban realm as much as possible. The site should become an exhibit of good-practice integration of nature and development. One of the ways in which this will be achieved is through the principle of ecological emulation. This principle seeks to use nature and its sustainable processes as a precedent for neighborhood and precinct design. Mimicking processes in nature, and elements of nature themselves, will be a central principle in the strategic interventions proposed later in this chapter.

### Learning through Experimentation

This principle acknowledges that in order for a paradigm shift to occur in terms of how cities, and key sites within cities, such as TRUP, become zones which facilitate sustainable development and the subsequent integration of humans and nature, a certain degree of experimentation is necessary. This promotes a series of pilot projects on the site, many of which are innovative and new. This principle thus proposes the creation of sustainable communities through actively engaging in a conscious shift in development norms and settlement making principles. Experimenting with different ways of living with the natural environment and building sustainable communities through bottom-up, participatory, cooperative, and creative processes, will be enabled and promoted. In this way, learning, in terms of integrating humans and nature in sustainable development, will occur, engaging a range of stakeholders. This also offers opportunities for engagement

with research and tertiary education facilities to steer and essentially pioneer this development, with the help of the creative, environmental, and planning realms.

### High Density

To prevent urban sprawl and promote sustainable urban expansion it is necessary to achieve high-density development (UN-HABITAT, 2014). Densification creates more compact structures that improve access to work, services and public transport. It also provides more efficient use of infrastructure and public transport. Higher-densities also give meaning to space and create vibrancy and interaction among people. In higher-density developments, choice is maximized and diversity of people is achieved. The principle addresses population growth and is a response to rapid urbanization and the need to carefully manage well-located land for development in the city, such as the TRUP site.

### Mixed Land Use

This principle encourages the development of a range of compatible activities and land uses close together in appropriate locations, which are flexible enough to adapt over time to the changing market. The purpose of mixed land use is to create local jobs, promote the local economy, reduce car dependency, encourage NMT, provide closer public services and support mixed

communities (UN-HABITAT, 2014). It also aims to consolidate a range of functions into a single location or within close proximity to each other so they are more accessible. This challenges the idea that land use functions should be separated and kept apart.



(Source:  
[http://www.elevationdcmedia.com/devnews/storeyparkprogress\\_102413.aspx](http://www.elevationdcmedia.com/devnews/storeyparkprogress_102413.aspx))

### Efficient Movement Network

This principle encourages sustainable accessibility, social interaction, public safety and access to amenities.

Adequate street networks need to be developed that work for private vehicles, public transport as well as pedestrians and cyclists. A hierarchy of street networks will shape the

urban structure and set the pattern of development of blocks, streets, buildings and open spaces (UN-HABITAT, 2014). These movement systems will be primarily aimed at providing for public transport, non-motorized transport, and pedestrian experiences. The system will become an open space network, providing a high quality public realm.

### Integration

This principle promotes the integration of various values, principles, goals, and objectives to inform the SDF and its strategic interventions. Integration is also promoted between human and natural processes, and ecological and development agendas. This principle also promotes the integration of different social and economic classes within the same area and ensures that different types of housing typologies and tenure are provided to accommodate them. Social mix and mixed land use are interdependent as mixed land use leads to social mix (Botha, 2015). Social mix is a socio-spatial concept and aims to address problems such as poverty and segregation by promoting more social integration across different income groups, generating job opportunities, overcoming place-based stigma and attracting additional services to neighborhoods (UN-HABITAT, 2014).

### Resilience

Resilience refers to the capability of both human systems and natural systems to prepare for, respond to, and recover from significant threats, particularly related to climate change. Resilience is the ability of the socio-ecological system to bounce back, should there be any significant climate change event, such as flooding. The extreme weather events brought about by climate change threaten to damage residential and urban property and health, infrastructure, the economy, and the delivery of social services.



(Source: <https://www.wur.nl/en/project/Nature-in-Cities-a-European-Exploration.htm>)

## Compactness

The idea of compactnesscity emerged to counteract sprawling, low density urban development. The idea favors infill and land use intensification in urban and already developed areas, rather than development sprawling into peri-urban and rural areas which are less accessible and further away from the opportunities which the city offers. The principle encourages two main features: densification and mixed land use. Densification is essential to use underutilized land in the city and to ensure that public transport is viable in terms of densities. It also ensures that land is used more efficiently and aims to reduce urban sprawl. For this reason, development on underutilized land, subdivisions, conversions, and additions are all key (Jabareen, 2009). Mixed land use aims to ensure that a range of facilities, opportunities, and choices are available in close proximity to each other. It seeks to challenge the idea of sprawling development where housing, employment, and other facilities are segmented from each other by function and are poorly connected. This enables better access and begins to contest the idea that for a rich urban life, owning a car to travel long distances to access services and opportunities is necessary. This idea means that by incorporating a mix of land uses in a plan, people who live in that area can live, work, and play in close proximity to each other. This is especially important along transport corridors and nodes to enable neighborhoods

which are all-inclusive and provide for the rich and complex facets of urban life, in close proximity to one another. This principle informs one of the most important concepts for the development of this SDF (discussed later on): The Compact City Concept.

### Accessibility

Accessibility refers to people's abilities to access and reach a range of services, opportunities, and choices easily. It also entails the time and money that people devote to transportation. Through the accessibility grid, access, linkage, and permeability of urban areas and different neighborhoods is encouraged in all directions. The idea argues that all public areas should be easily accessible and spatial planning should minimize barriers to entry and movement. Accessibility to resources, social services, and economic opportunities is promoted through the creation of and upgrading of linkage and transport systems, arranged in a clear hierarchy, and the sustainable mix of land and transport uses in a live, work, play environment. These linkages will be created into surrounding neighborhoods and within the site, between points of interest/activity.

### Spatial Justice

Spatial justice refers to equity in terms of the distribution of urban activities, spaces, services, and opportunities. This includes equal distribution of recreational activities, urban parks, and green public open spaces. Equity, in this case, refers to both human and ecological systems. Spatial justice is also concerned with decision making and approaches to planning which treat all people, and the natural environment, equally. In this way, it challenges the norms in South Africa relating to Apartheid spatial planning and aims to counteract discrimination and existing disparities. As a principle, spatial justice, in its ideal state, is unachievable. Therefore, key sites in urban areas, such as the TRUP site, can become catalysts for spatial justice principles.

### Waste as a resource

This principle seeks to change the way in which we see waste in the urban context. Instead of it being discarded, and sent to landfill, this principle promotes the idea of waste as a resource in a cyclical system, similar to the processes of nature. The waste, for example, of one business or industry becomes the resource or input for the next. However, this principle is problematic in the sense that it assumes that the creation of waste is inevitable. This principle, in the context of this framework, will therefore be extended to aim to not only minimize waste, but to

eliminate it altogether. This will be achieved through zero-use of harmful wastes and a change to view organic wastes as resources.



(Source: <https://bhavanajagat.com/2015/04/22/bhavanajagat-earth-day-celebration-patience-in-suffering/>)

Good urban design and criteria for good settlement making

This principle seeks to ensure that the proposed development of the site conforms to the criteria for good urban design and settlement making, such as clearly defined transitions from public to private spaces, the use of nodes, lines, edges etc in the creation of the neighborhood structure, and the careful consideration of a high-quality public realm which is permeable, legible, flexible, and cohesive.

#### 4.7 Key Goal and Objective: Integrating Humans and Nature

The key goal and objective of this framework is to integrate humans and nature more closely in the urban spatial planning context. The goal is to create a self-sufficient, sustainable neighborhood with eco-intentional communities, where nature is promoted, celebrated, and integrated into everyday life. This integration will occur through the creation of a high-quality green open space realm and through the integration of ecological planning principles into the spatial planning process. The objective is to guide development towards having a positive impact on the natural environment and vis a versa. The goal and objective for the development of the site is to promote innovation and a conscious shift in ways of living, by enabling new ways of living in urban areas.

## 4.8 Conceptual Development

This section articulates the conceptual development of the spatial development framework for the site. This process is presented firstly through a number of broad concepts which guide the development of strategic interventions, and are informed by the previous sections of this chapter. Secondly, the spatial conceptual development process, which aims to spatially contextualize the broad concepts to the TRUP site through an explorative design process of overlaying and rough conceptual sketching, is presented.

The broad concepts used in the plan for the site are as follows:

### 4.8.1 The Eco-Village Community Concept

This concept involves intentional community living. Conscious living towards sustainability is being practiced all over the world. One of the ways in which it manifests itself is through eco-villages, such as the one on the TRUP site at Oude Molen. These eco-villages seek to bring together people who have made a conscious decision to live more closely with nature in a way which is off-grid, self-sustaining, and often involves low-impact activities and food production. The concept brings together a diverse range of people into a space, which is collaborative and participatory. This concept, which is innovative, is one, which should be incorporated into the urban fabric of cities

in order to exhibit models of sustainable living and integrated human-nature relationships.



(Source: <http://ecovillageithaca.org/eviwp/wpcontent/uploads/Song-Neighborhood-Aug-2007.jpg>)

### 4.8.2 Urban Growth Management and the Need for Compaction

Mass urbanization and the inability of government to accommodate the increasing urban population have led to the need for urban growth management in South African cities (Botha, 2015). Urban management should aim to guide intensive urban development towards the most appropriate locations in cities and to consider the optimal use of existing infrastructure.

Some of the arguments that are in favor of compaction include the need to reduce movement, air pollution, dependency on non-renewable resources, to make the most of existing investment in infrastructure and social facilities, and to increase the thresholds of services (Jenks & Burgess, 2000).

#### 4.8.3 The Compact City Concept

The primary spatial principle that was used in the preparation of the planning framework was the concept of the compact city. The compact city model is considered to be the most effective planning strategy to contain urban sprawl and develop more sustainable cities (Cereda, 2009).

Jenks and Burgess (2000: 10) defines the compact cities model approach as a strategy “...to increase built area and residential population densities; to intensify urban economic, social and cultural activities and to manipulate urban size, form and structure and settlement systems in pursuit of the environmental, social and global sustainability benefits derived from the concentration of urban functions”.

The main focus of the compact city, according to Botha (2015), is on the provision of transport, resource efficiency, social equity, accessibility and economic viability. It is essentially a high density, mixed-use city with clear boundaries and an efficient public transport system (Jabareen, 2006). Urban compaction can be implemented

in a variety of scales from urban infill to the creation of new developments. The idea of a compact city involves many strategies that all aim to create compactness and density that can solve many of the problems of today’s cities. This concept is favored because it offers the opportunity to reduce fuel consumption for travelling since facilities and services are closer together, urban land can be reused and natural resources and biodiversity areas beyond the urban edge are protected (Jabareen, 2006). In this way, the model, shown in figure 56, is widely accepted as being a sustainable urban management tool for urban sustainability.

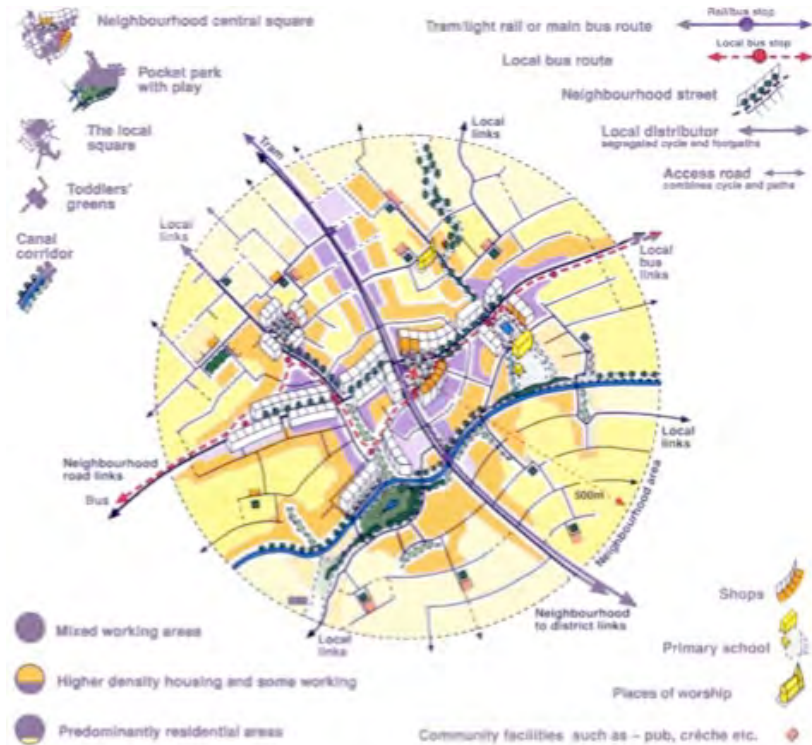


Figure 56: Compact City Model (Source: Google Images)

The compact city model should be supported on the TRUP site for several reasons. Firstly, compact cities are efficient and allow for more sustainable modes of transport. Secondly, they are seen as a sustainable use of land as they reduce sprawl, protect natural resources and biodiversity areas and encourage infill development in urban areas, reducing the footprint of the built environment. Thirdly, the model promotes diversity, social cohesion and cultural development. Some also argue that

the model is equitable as it offers good accessibility within cities. Fourthly compact cities are economically viable because infrastructure such as roads and electricity can be provided cost-effectively and the high population densities are able to support local services and businesses (Jabareen, 2006).

#### 4.8.4 Sense Of Place

Creating a sense of place is concerned with memorability and uniqueness and rejects uniformity. It seeks to enhance the positive attributes on a site to strengthen the positive feeling and character of the site. According to Botha (2015), there are a number of factors that contribute towards the creation of a sense of place. First is the appropriateness of city form to the characteristic of the landscape. Second is the quality and consistency of public spaces as well as the use of local skills and resources to meet local needs. Third is the legibility of the urban environment and the clear definition between public and private spaces as well as the use of landmark buildings. Finally, is the creation of 'special places' where people can escape the struggle of daily life and be treated with respect and dignity (Dewar et al, 2012).

#### 4.8.5 Efficiency

Efficiency is concerned with minimizing the energy use of cities, which relates to human activities. This relates to

minimizing the use of non-renewable energy types, such as petroleum and oil in private car use. For the purposes of the TRUP site, metabolic restructuring will aim to take the development “off-grid” and make use of renewable energy alternatives. All development will be powered by renewable energy sources, harvested on site, such as solar and wind power.

#### 4.8.6 Triad Of Domains Concept

McKaye’s triad of domains theory argues that a region is composed of three different landscapes or domains: urban, rural and wilderness. Each of these domains has specific characteristics and needs to be maintained and balanced as part of urban growth management. The Wilderness domain includes natural ecosystems, the rural domain includes agriculture and forestry activities and finally the urban domain includes urban areas (Todeschini, 2014). The concept calls for the establishment and control of a balance between the three domains. The concept also demands, according to Dzinotyiweyi (2009), that before establishing the urban domain, the rural and wilderness domains should be considered in order to structure and give meaning to appropriate urban development. For the purposes of contextualizing this concept to the TRUP site, Wilderness will include core areas, ecological support areas, and conservation areas of critical biodiversity and natural resources. Rural domains will include buffer areas, agricultural areas, and low-positive

impact development areas. The urban domain will be made up of areas identified as being appropriate for sensitive urban development, infill development, and densification.

From Figure 57, it is evident that activity and development corridors, as well as nodal development should seek to integrate the three domains by locating in areas where the three domains intersect. Considering the wilderness and rural domains first, as the ecological basis for the spatial planning and framework development process, the spaces that are left between the wilderness and agriculture domains is then available for urban development to take place.

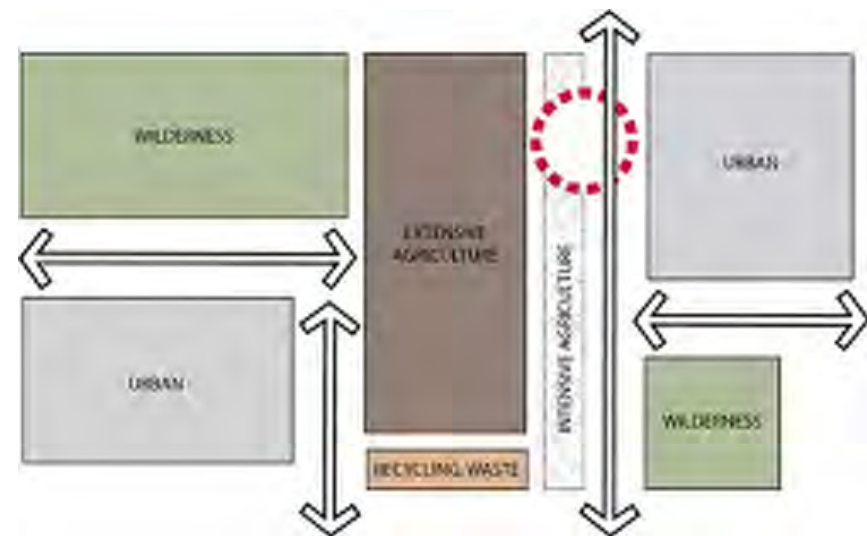


Figure 57: Concept Diagram of the Relationship Between Triad of Domains (Source: Botha, 2015)

#### 4.8.7 Integration and Continuity Concept

Positive urban environments have integration between the different elements of a city (Dewar & Uytenbogaardt, 1991). This refers to social (not marginalizing people), economic (accommodating large and small businesses), environmental (accommodating the natural environment), physical (accommodating people), and cultural (accommodating diversity) elements. The concept of continuity is central to integration: there are three types that are important. The rest is the continuity of movement. According to Botha (2015), continuous movement lines should tie different local areas together to break down fragmentation. This can be achieved through the emergence of activity corridors in urban settlements. Continuity of green spaces is also important for biodiversity and natural regeneration and to ensure a continuous network of green spaces for people to move through the city. It is also important that people have access to nature. Just as important is the continuity of the urban fabric, which refers to the need to move away from urban forms that are a collection of fragmented parts towards an urban form that is a coherent system, including nature and ecological elements (Dewar & Louw, n.d).

#### 4.8.8 Interlinked Green Web Concept

An ecological corridor system consists of core areas, corridors and buffer zones. The ecological corridors create connections between the core areas and their ecological

support zones. The core area and various connecting ecological corridors should have a buffer zone that will protect the areas from disruptive development while allowing low impact activities to take place. The buffer around the core ecological corridor zone on the TRUP site should be used for extensive agriculture as well as markets where produce can be sold to the public. Another activity that can happen in this buffer is low-impact renewable energy production, recycling and waste disposal activities, such as using organic waste from the city to fertilize agricultural land, eco-tourism, and positive-impact development.

There are three types of corridors which exist, according to Sicirec (2015): linear, landscape, and stepping-stone corridors. Linear corridors are long uninterrupted strips of vegetation, stepping stone corridors consist of a series of small non-connected habitats and landscape corridors consist of diverse and uninterrupted landscape elements (Sicirec, 2015). The corridors also deliver a range of other social and environmental benefits that includes the enhancement of the local landscape, better opportunities for public access and recreational use through a network of linked green spaces. They cover natural landscapes such as rivers, floodplains and mountains, as well as "corridors" of unsealed land (Botha, 2015). Ecological corridors should be created to support natural systems where all areas of natural value are included in a

biodiversity network to ensure the conservation of biodiversity (Nilsson et al, 2013). The ecological corridor on the TRUP site is shown in figure 75. It includes the riverine system, with its associated wetlands and ecological support areas, and the biodiversity and conservation networks.

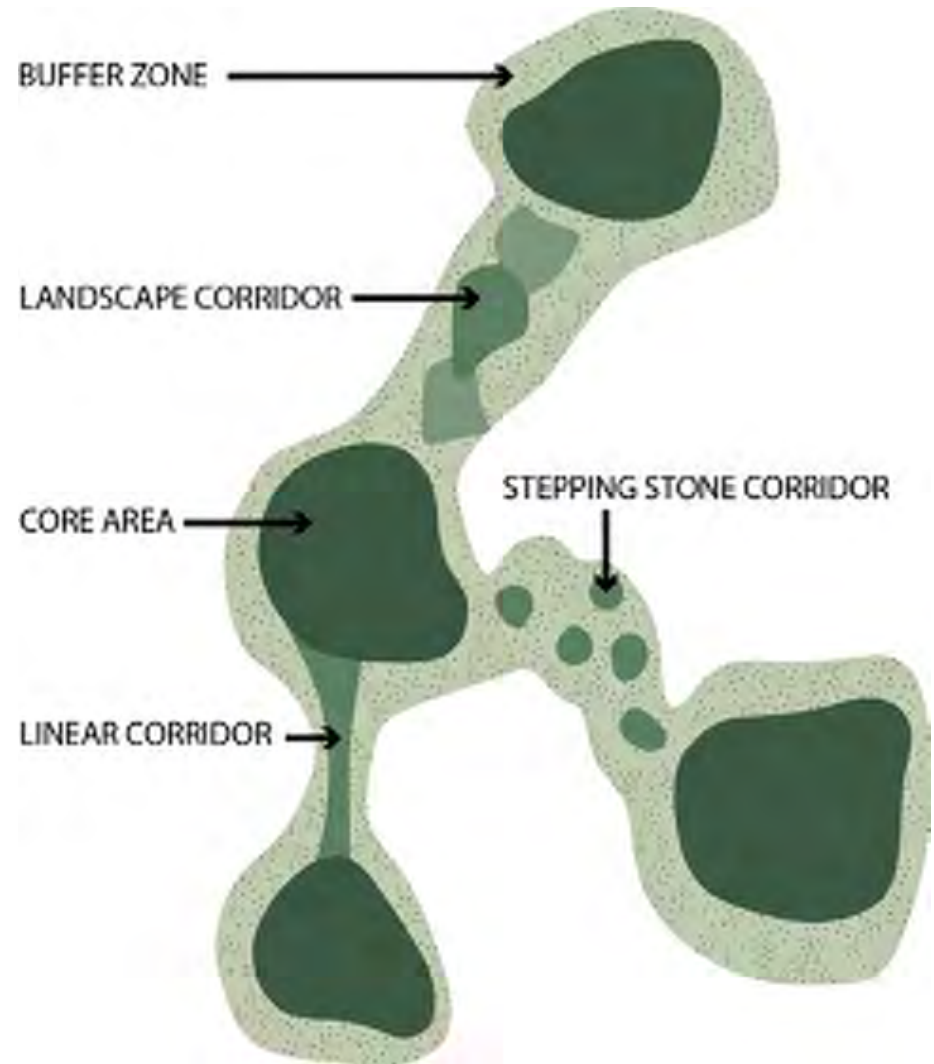


Figure 58: Ecological Corridor Concept (Source: Botha, 2015)

### 1.7.8 Conceptual Hierarchy Of Public Spaces

Public squares are superimposed on the conceptual grid, as can be seen in Figure 59. The positions of the squares and the intersections create hierarchical levels of public squares, with three levels of order emerging (Botha, 2015). The central square takes a higher level of centrality while the secondary and tertiary squares are situated at cross overs within the grid (see Figure 60). These squares each attract different activities to them, which in turn define the character of the squares. The lines within the grid are the conceptual movement systems, explained later in this chapter. From Figure 60, it can be seen that the hierarchy of public squares correspond to the hierarchy of movement. Land uses will also respond to these patterns of hierarchy. Higher order activities depend on high levels of movement and will naturally seek out the most accessible locations. This complex pattern allows for a range of activities to find their place naturally within the structure (Botha, 2015). Compatible patterns of activity and usage will emerge over time (Dewar & Uytendogaardt, 1995).

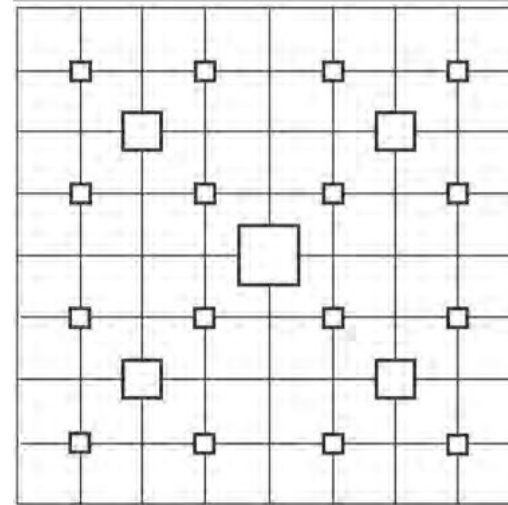


Figure 59: Hierarchies of Public Squares Concept (Source: Botha, 2015; Dewar & Uytendogaardt, 1995)

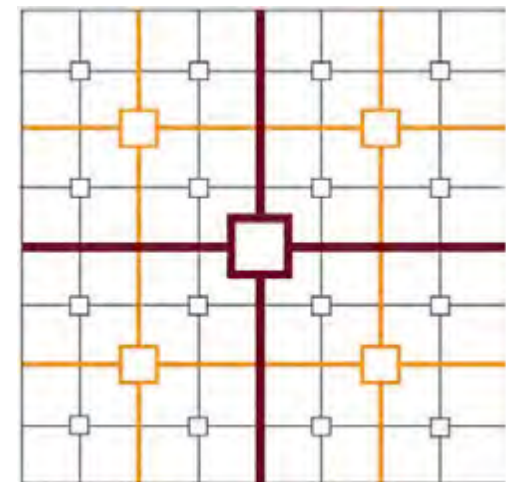


Figure 60: Hierarchies Of Public Squares Relating To Movement Routes (Source: Botha, 2015)



#### 4.8.9 CONCEPTUAL MOVEMENT SYSTEMS

The infrastructural elements of the movement system and their patterns of interconnection has an impact on the accessibility and therefore on economic and social opportunities. The movement system is used structurally to create a new and decentralized pattern of opportunities. The movement system plays a significant role in shaping the structure of the area through establishing new points of high accessibility and intense activity (City of Cape Town, 1999). This hierarchy of movement, shown in figure 61, allows for movement routes of different types, with different activities along them. These are arranged in a logical hierarchy, from fast-moving freeways right down to pedestrian walkways, with each level of the hierarchy carefully integrated with the others. The routes will integrate a number of forms of transport options, and transport nodal interchanges will be located at points where movement systems and different transport options intersect (shown in figure 62).

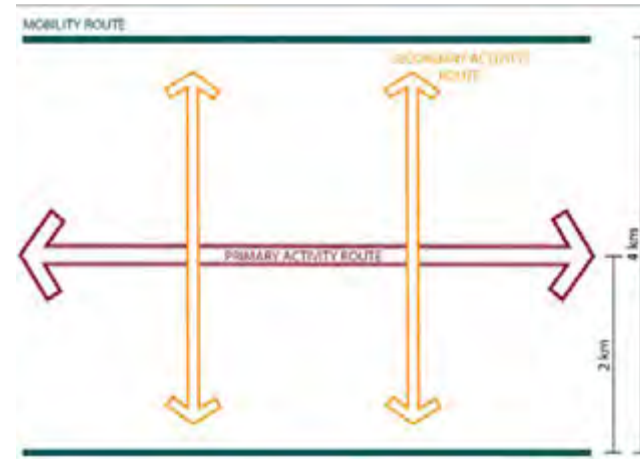


Figure 61: Hierarchy of Accessibility (Source: Botha, 2015)

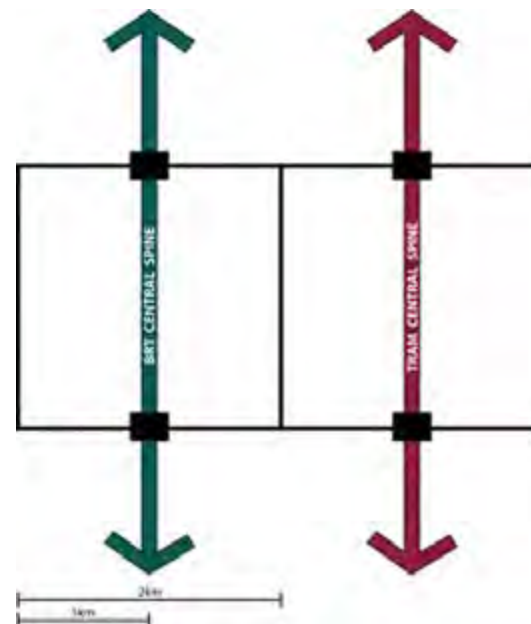


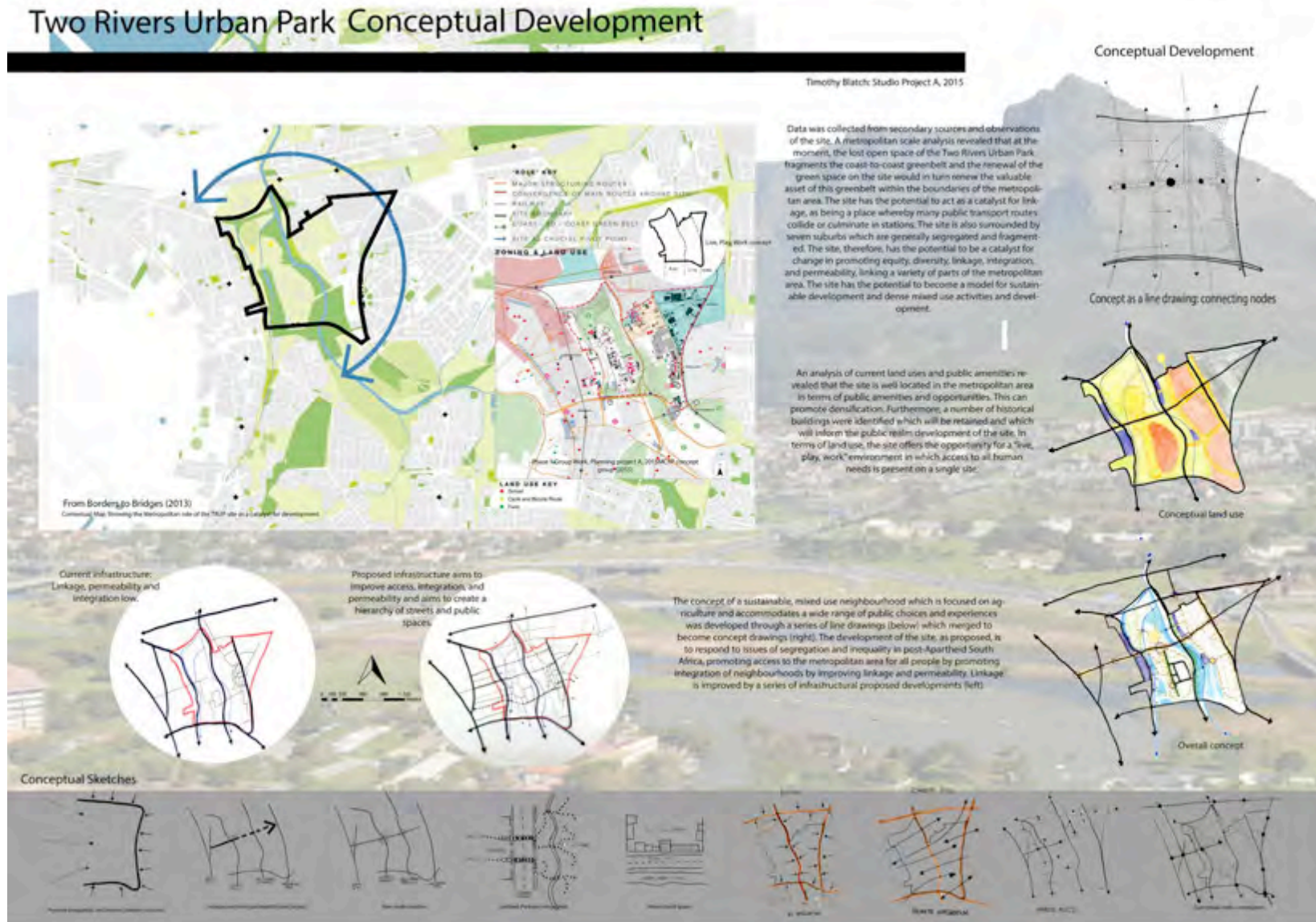
Figure 62: Integration of Public Transport Modes (Source: Botha, 2015)

## 4.9 Spatial Concept Development

This section is largely a graphic exploration of the above-mentioned broad concepts, showing how they relate to the TRUP site. It was developed through a drawing process of overlaying spatial layers and concepts. It is a spatial exploration of the principles, values, and theory which has informed this SDF. It culminates in the presentation of the spatial concept for the redevelopment of the TRUP site.

The conceptual development process is shown in figure 63.

Figure 63: Conceptual Development Process (Source: Author, 2015)



#### 4.10 The Concept

The concept for the site, shown in figure 64, is to develop an urban park to buffer the ecological and natural assets on the site and to inform the demarcation appropriate areas for development. The concept is to enhance the natural and ecological functioning of the site through sensitive development which aims to have zero-positive impact on the natural environment. In this way, the site will become a place for intentional, eco-village type communities to thrive. The intentional building of communities will ensure a mix of land uses, people, and opportunities. The site will become a place where good-practice sustainability initiatives and innovative building can be exhibited. The concept aims to densify development along major edges to the urban park, to define, and along major development and activity corridors. Nature, culture, and heritage will be celebrated and integrated into everyday life through the provision of a hierarchy of green public open spaces and community engagement. The development will be off-grid and will rely on innovative infrastructural techniques and renewable forms of energy to become a self-sufficient environment in which people can live, play, and work. Environmentally sensitive development will be ensured through sound management of natural assets. Continuous networks of movement, green spaces, and natural assets will be developed. Access will be improved through the creation

of east-west linkages and increased permeability. The site will aim to cater primarily for the pedestrian experience and will promote the use of public and non-motorized forms of transport. A local economy will be enabled and agricultural food production will be encouraged. A high-quality public realm will structure the development, with infill development, densification, and intensification on land that is deemed developable. The site will become a testing site for experimentation and research into development which seeks to better integrate humans and nature.

The final concept is shown in figure 64.

Figure 64: Spatial Concept (Source: Author, 2016)

1.9

# The Concept



Lost space on the TRUP site



SDF revisited to show areas which can accommodate densification



What densification of Oude Molen will look like in context



What densification of Oude Molen will look like in model town



The above series of images are reworkings of the SCF for the TRUP site showing how lost space, in the form of underutilized and badly maintained green space and undeveloped open land, can be "found" by the creation of an urban park and sustainable neighborhood precinct. Lost space is identified in image 1 and images 2-4 respond to this lost space and provide ways in which it can be "found" through the creation of a permeable and well-maintained urban park and through the densification and intensification of the Oude Molen precinct.

#### 4.11 Planning for Growth and Change Program

There is a need to plan for growth and change on the TRUP site. Because this SDF is a long term plan, it is developed in the context of urbanization, growing populations, and subsequent household, space, and land requirements to accommodate the growing population. This program will attempt to understand what the demand is for housing and facilities, what the demand will grow to with increasing populations, and how much space and how many facilities will be required to accommodate and supply the demand. Furthermore, planning for growth and change involves land carrying capacity calculations in order to understand how many people could be accommodated on the site. This program is also an exploration of whether or not there is enough space for growing populations on undeveloped land, or whether densification, infill, and intensification are necessary and at what densities new developments need to be planned to accommodate new households and consolidate the region as a sustainable system.

##### 4.11.1 Land Carrying Capacity

Table 4 and 5 show the summary of developable floor space allocation and the land carrying capacity calculations for the site respectively, which articulate the number of people and new households that can be

accommodated on developable land in terms of the required densities and developable floor space. It shows that by 2036, the site can be developed to accommodate another 18000 people.

<b>Summary of Developable Floor Space Allocation</b>		
<b>Developable Precinct</b>	<b>Area Allocated for Development (m2)</b>	<b>Total Precinct Area (m2)</b>
Alexandra	274727,3	347736,7
Maitland	38629,5	57064,8
Oude Molen	139786,9	189529,3
Ndabeni/Maitland	494936,8	557362
Valkenberg West	194674,4	256726,2
<b>Total (m2)</b>	<b>1142754,9</b>	<b>1408419</b>
<b>Total (ha)</b>	<b>114,3</b>	<b>140,8</b>

Table 4: Summary of Developable Floor Space Allocation (Source: Author, 2016)

<b>Land Carrying Capacity</b>	
<b>Site Size</b>	Approx. 300ha
<b>Developable Land For Densification and Mixed Use Development</b>	114,3ha
<b>Density</b>	
<b>Low Density</b>	30-40du/ha
<b>Medium Density</b>	40-50du/ha
<b>High Density</b>	50-60du/ha
<b>Average Density Required</b>	45du/ha
<b>Total number of households/dweilling units that can be accommodated by 2036</b>	5144
<b>Approx, number of people/household</b>	3,5
<b>Approx, Future Population Growth on site</b>	18004

Table 5: Land Carrying Capacity Calculations (Source: Author, 2016)

#### 4.11.2 Social facilities Threshold

The CSIR (2012) provides generally accepted guidelines for the provision of social services and facilities. These are shown in Table 6 below. Additionally, table 7 shows the future demand for social facilities and subsequent land in order to identify what facilities and in what quantities must be provided on the TRUP site, based on the CSIR guidelines, in order to adequately provide for the proposed growth in the population on the site. This will lead to an investigation of the land area required to accommodate these social facilities. The total land required for new social facilities is 16,1638ha. This will be incorporated into the SDF.

	900000	
Social		
Place of Worship	1600-2000	1.2km
Post Office	8000-10000	7-10km
Market	2000-2500	1.5km
Local Libraries	20000-70000	8-10km
Recreation		
District Park	60000-100000	10km
Urban Park	Variable	1km
Local/Neighborhood Park	3000-15000	1km
Sports Fields and Public Spaces	15000	3km

Table 6: CSIR Guidelines for the Provision of Social Services (Source: Author, 2016, CSIR, 2012)

CSIR guidelines for the provision of new social facilities due to population growth		
Facility	Population Threshold	Acceptable Travel Distances
Education		
ECD Centers	2400-3000	2km
Primary Schools	7000	5km
Secondary Schools	12500	5km
Health		
Clinics	100000-140000	90% pop within 5km
Community Center	5000-8000	4.5km
Regional Hospitals	300000-	30km

<b>Social Facilities Demand by 2036</b>			
<b>Facility</b>	<b>Number Required by 2036</b>	<b>Required Floor Space (m2)</b>	<b>Required Floor Space (ha)</b>
<b>Education</b>			
ECD Centers	4	696	0,0696
Primary Schools	2	13920	1,392
Secondary Schools	1	7830	0,783
<b>Health</b>			
Clinics	1	1740	0,174
Regional Hospitals	0	0	0
<b>Social</b>			
Community Center	3		
Place of Worship	11	4785	0,4785
Post Office	2	950	0,095
Market	8	19507	1,9507
Local Libraries	8	10450	1,045
<b>Recreation</b>			
Urban Park	1	90560	9,056
Sports Fields and Public Spaces	2	11200	1,12
<b>Total Number and Floorspace for Public Facilities</b>	<b>43</b>	<b>161638</b>	<b>16,1638</b>

Table 7: Social Facilities Demand by 2036 (Source: Author, 2016)

#### 4.12 Strategic Interventions

This section aims to present a set of strategies which will guide the development of the TRUP site. The strategies should be treated as policy guidelines for the spatial development framework of the site. The strategies aim to integrate ecological planning into the spatial planning

process, with a focus on creating positive urban environments which minimize impacts on the natural environment and rivers on the site. Not only will the strategies seek to guide the minimalization of environmental impacts, but they will also aim to enable development which has a positive impact on the environment, protecting, restoring, and enhancing it. The strategies aim to enable flexibility and establish a legible structure for the site which will allow for the concept and vision to be carried through. The strategies are as follows:

##### 4.12.1 Increase Access and Movement Opportunities to Unlock the Site and Erode Barriers to Access

This strategy aims to promote clear and logical movement systems which provide for both movement and access through and within the site between and along strategic activity areas. This movement system will provide increased access to a range of opportunities. Challenging the over-reliance on the automobile as the primary form of movement in the city, and the subsequent infrastructure design to facilitate its usage, this movement system is geared towards non-motorized and pedestrian forms of movement. As such, a range of opportunities should be available within walking distance of each other and of areas where people will and currently live.

#### 4.12.1.1 Facilitate Improved Access

Access to opportunities on the site and the permeability across the site from surrounding neighborhoods will be ensured by facilitating efficient movement in all directions, based on the accessibility grid concept (explained below), primarily by means of public and non-motorized forms of transport. Access points to the site will be increased to open the site up to the city. These points will provide linkages from surrounding suburbs to the site. The new proposed movement systems are shown in figure 65. It is shown that road extensions are proposed to open the site and connect it to the proposed city development and intensification of the Voortrekker Road corridor, and the extension and creation of east-west linkages and a “Park Road” which frames the park on the east edge.



Figure 65: proposed Movement Systems (Source: Author, 2016)

## The Accessibility Grid

Central to this strategy is the establishment of a multi-modal and multi-directional accessibility grid. The aim is to set up a network of movement routes to facilitate and maximize access to, through, and on the site. The concept is shown in figure 66. The concept aims to facilitate the development of a hierarchy of movement routes which provide varied but complementary roles at a number of scales. These routes seek to accommodate a range of accessibility, permeability, linkage, and mobility functions. Public transport should be concentrated along higher-order development and activity routes, with lower order routes having connector and feeder functions to improve permeability and linkage and to support the higher-order routes.

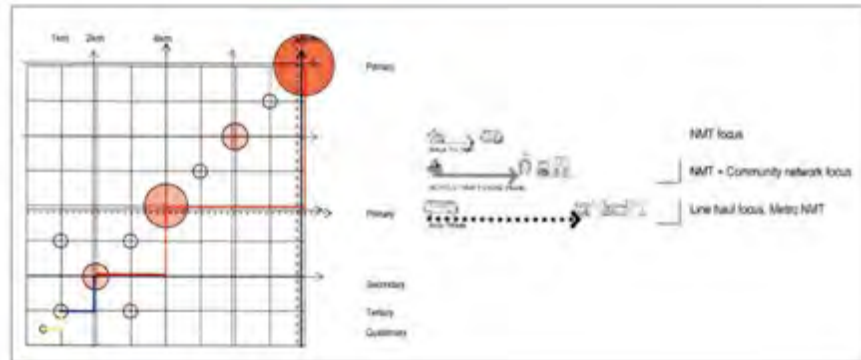


Figure 66: Accessibility Grid Concept (Source: Botha, 2015)

The primary accessibility grid consists of development and activity movement routes (shown in figure 67). These are city or district scale routes of continuous, high-density development and intensified land use. They also usually provide for public transport. They are supported by a network of urban freeways, dedicated public transport routes, and the rail network. The primary access route on the TRUP site will be Alexandra Road, with higher densities, public and non-motorized transport provision and intensified land use. The M5 and the N2, as well as the rail network will support this route.

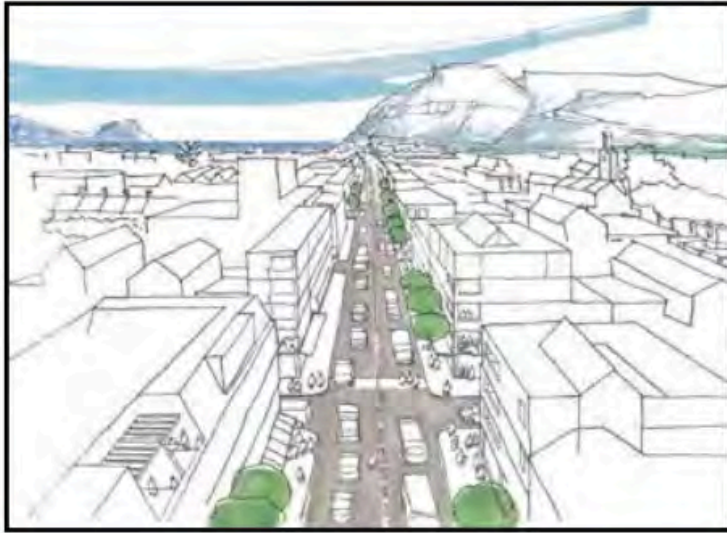
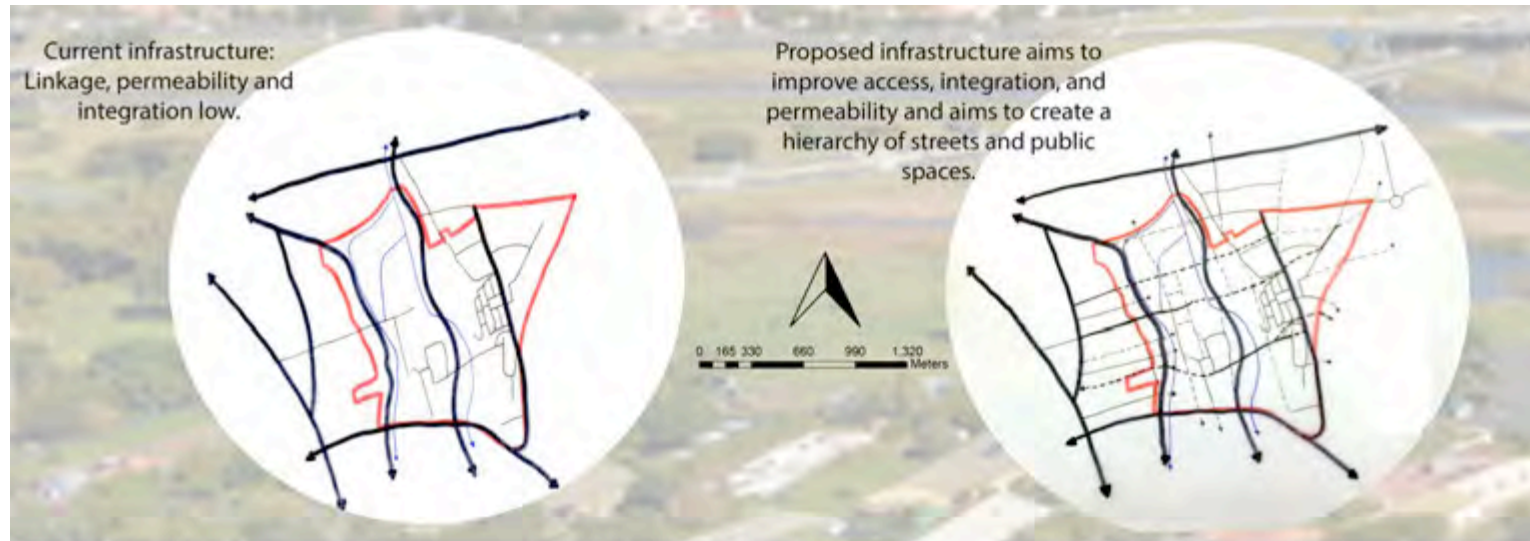


Figure 67: Development and Activity Route Typologies (Source: TBSDFEMF, 2012)

The secondary accessibility grid consists of activity streets and other structuring routes, supported by a network of connector routes. These are district and local area scale routes which provide structure to neighborhoods and consist of concentrated activities such as mixed land use, business, public transport, and local institutions and facilities. Furthermore, they provide support for higher-order primary routes by providing necessary access and connections. The secondary routes proposed on the TRUP site will be the extension of Station Road, the Liesbeek Parkway, and routes along the edge of the urban park, such as in the Valkenberg West precinct and along the eastern development edge.

The tertiary and quaternary accessibility grid consists of smaller routes with less intense functions as primary and secondary routes. The focus of these routes is on non-motorised forms of transport and pedestrian usage to provide structure and access on a neighborhood and precinct scale. The proposed tertiary and quaternary routes for the site are the extension of east-west linkage routes (such as Berkley Road), a network of streets, and a network of pedestrian walkways which provide structure and order for the park and increase its legibility, running between park and walk areas to limit car access.

The hierarchy of routes proposed for the TRUP site is illustrated in figure 68, with the hierarchy illustrated through line thickness and intensity.



## Hierarchy of Accessibility Routes

Figure 68: Hierarchy of Accessibility Routes (Source: Author, 2016)

### Public Transport and Non-Motorized Transport

This SDF prioritizes public transport and non-motorized forms of transport to promote active lifestyles and provide a well-designed public realm on streets for the pedestrian experience. These forms of transport will reduce carbon-dioxide emissions, minimize the use of cars, lower transport

costs, and ensure vibrance and complexity of movement systems. Public transport will be made viable through increased densities, along major development and activity routes, and a walkable neighborhood will be ensured

through the establishment of a live, work, play environment, where a mix of land uses, functions, and activities are accessible within walking distance of each other. In this way, similar to the example presented of The Ramblas in Barcelona below (figures 69 and 70), streets and movement routed will become sites

where community engagement and a range of pedestrian-centered activities will thrive and flourish.

### THE RAMBLAS, BARCELONA

The Ramblas in Barcelona is an example of a multi-functional boulevard that provides sufficient space for pedestrian activities and accommodates public as well as private transportation. The wide central promenade that is

lined with trees is focused for walking while the roads for automobiles are pushed to the sides of the promenade. The buildings that line and define the street are between five and seven stories. The central walkway varies in width from 11 meters wide to 24 meters. The Ramblas can be thought as a long, linear urban park (Jacobs, 1993).



Figure 69: The Ramblas, Barcelona (Source: <http://blog.theiaian.com>)

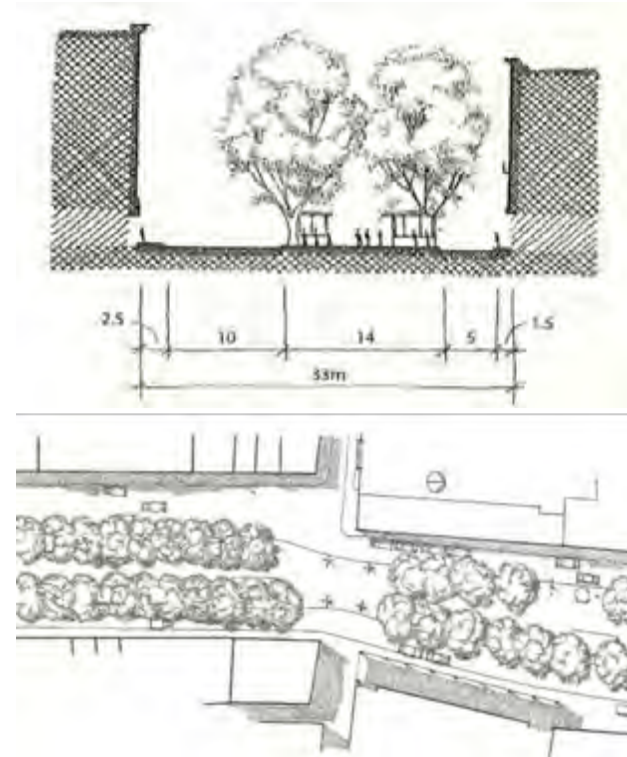


Figure 70: Plan and Section of the Ramblas, Barcelona (Source: Jacobs, 1993)

## MIDTOWN GREENWAY, MINNEAPOLIS

The Midtown Greenway (shown in figure 71), is a biking and walking trail across the city. The greenway is separate from the streets. This offers barrier-free bicycling, which makes trips across the city fast (Midtown Greenway Coalition, 2015).



Figure 71: Midtown Greenway (Source: Midtown Greenway Coalition, 2015)

#### 4.12.1.2 Enable Corridor Development

Corridors are movement/ public transport routes which have concentrations of economic and other activities along them (figure 67). The concentration of activities along major routes which have the potential to become development corridors allows for better and easier access to opportunities and enables higher densities to make public transport viable. Corridor development on

the TRUP site will be enabled along Alexandra Road primarily, as well as along development and activity routes, such as the proposed extension of Station Road.

4.12.1.3 Promote Development Intensification around strategic nodes and along strategic routes to promote higher density, mixed-use development in key nodal and movement locations where mixed use activities are clustered to ensure ease of access, provide density thresholds to support the nodes, and reduce/eliminate the need for extensive travel. Development intensification on the TRUP site is proposed around the nodes and along the routes shown in figure 72. It is proposed along routes associated with the primary and secondary accessibility grid. A hierarchy of nodes is proposed to structure the intensity of development. These nodes are defined by the TBSD FEMF (2012) as being points of maximum exposure, centers of activities, intersections between movement routes, and areas of intensive and clustered mixed-use, high-density development. The areas for land development intensification and the hierarchy of nodes proposed are shown in figure 72.

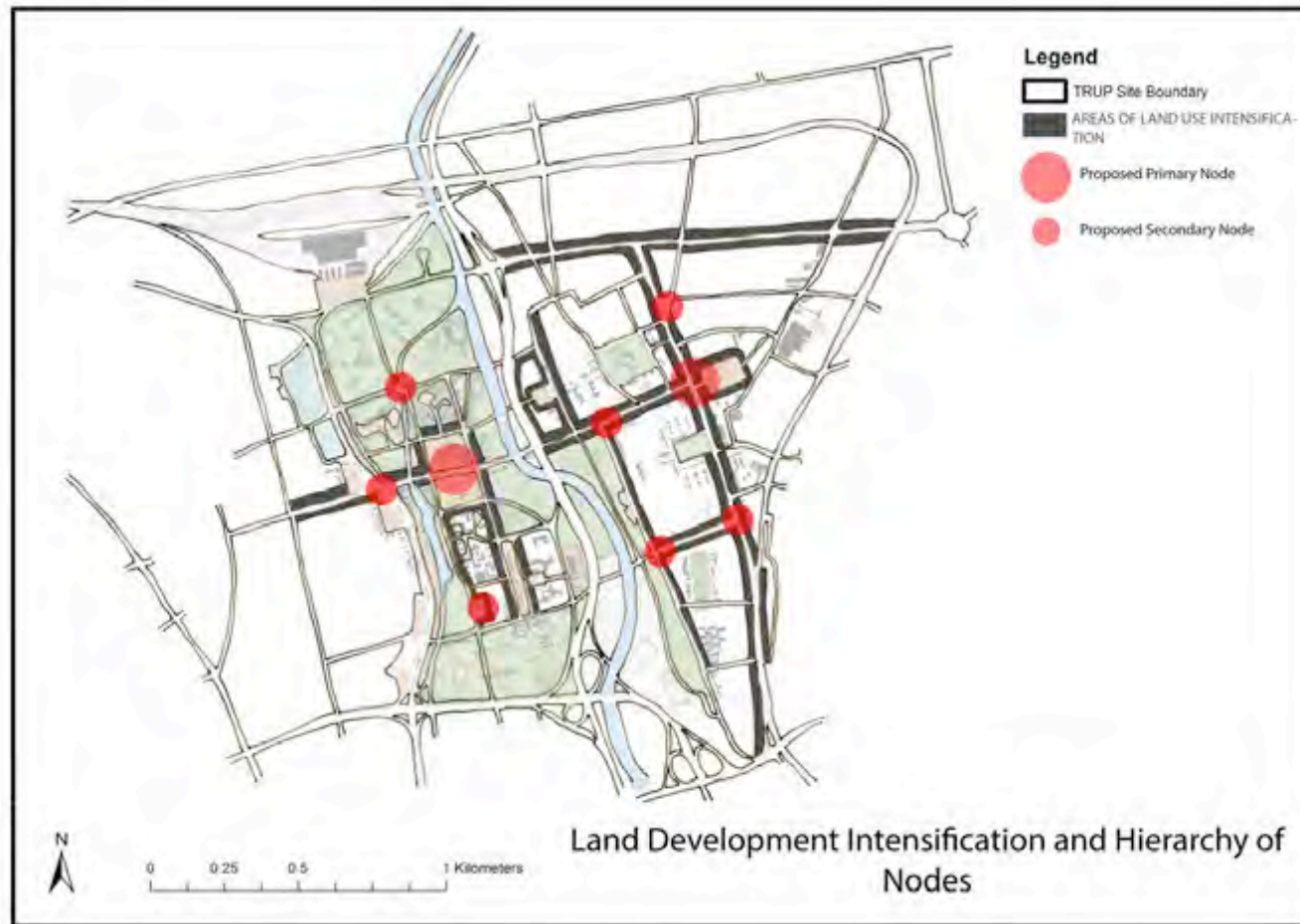


Figure 72: Proposed Development Intensification and Nodes (Source: Author, 2016)

#### 4.12.1.4 Upgrade and harness the potential of the Rail Network and its Stations

In order to provide for transport options which maximize choice and are affordable, the rail network and its associated stations, which are both strategically located around the TRUP site, will need to be upgraded. The potential of the site to facilitate movement between stations, as well as maximize rail viability and usage is immense. Higher density development should be facilitated along the rail system and around stations. Additionally, stations should be used as a basis for nodal selection and determination and the clustering of mixed-use activities.

#### 4.12.1.5 Make existing boundaries permeable: Building Bridges

A number of bridges, over rivers and other movement routes, are proposed in order to increase accessibility and permeate current barriers to access. Additionally, the proposal for new road and street linkages discussed above provides route designations to make the site more permeable, especially with new east-west linkages.

4.12.1.6 Provide and Facilitate Access to public facilities and opportunities by improving the efficiency of public transport systems

Provision of social services such as ensuring efficient access to education and health services, will be prioritized. These social and other services should be clustered together in central or nodal areas. These services should have back and forth linkages and should define the urban core of the site, along with the public realm and open space system.

4.12.1.7 Cluster the provision of Public Facilities at nodal points which are easily accessible

Public facilities provide essential support systems for urban residents. As resource constraints have become a reality, focusing on communal facilities and public places can reach the largest number of people. They provide places for people to interact around economic, cultural, recreational, education and social activities. If these spaces are appropriately made, they can contribute towards the identity of an urban environment by defining space and encouraging activity. This also has the potential to build a sense of

community and place (City of Cape Town, 1999).

#### MULTI-PURPOSE FACILITY CLUSTERS

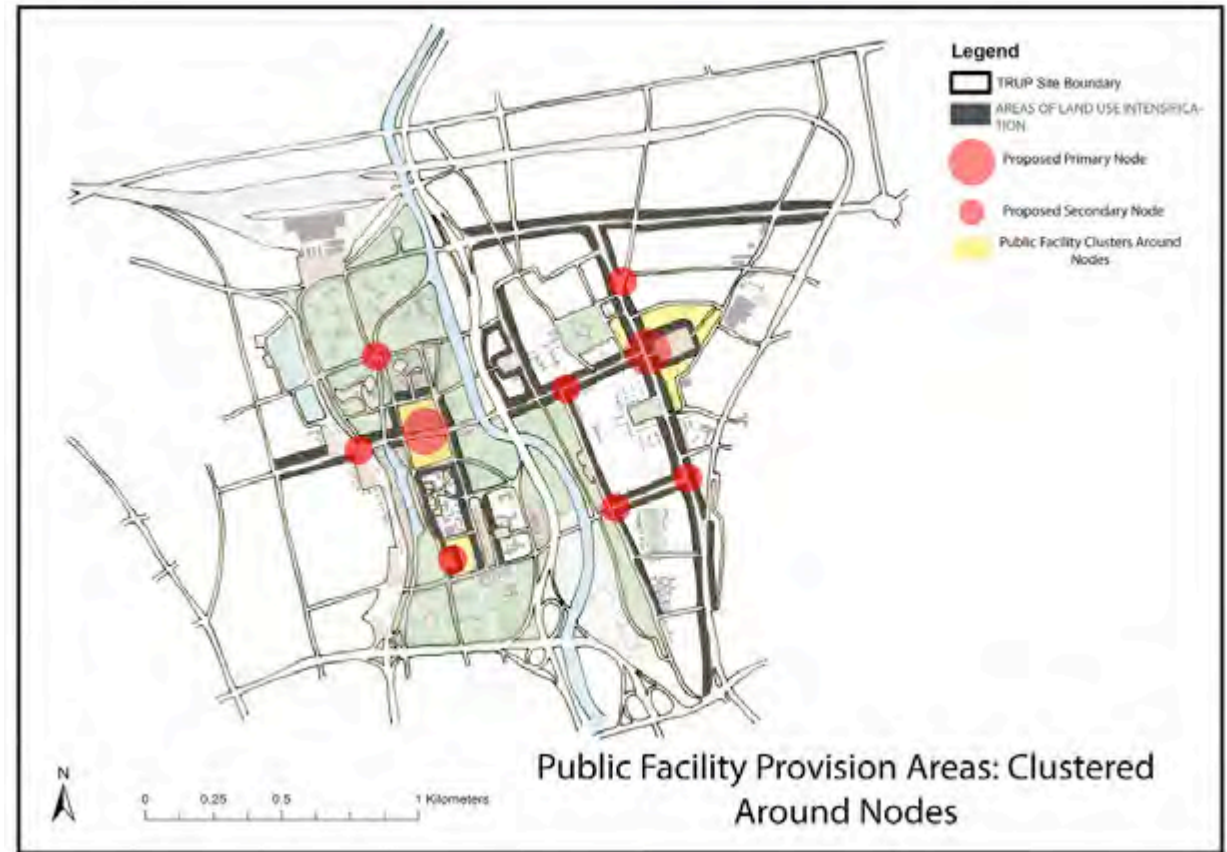


Figure 73: Public Facility Provision Around Nodes and Areas of Development Intensification (Source: Author, 2016)

The positioning of public facilities on the TRUP site will be determined by nodal areas and areas of highest accessibility, shown in figure 73.

These facilities and services will be clustered together to reduce travel time and distance to services and to provide a range of services in one single place. The cost in providing public facilities is also reduced as these facilities share resources, land and equipment. Other advantages include greater security, the integration of different communities and a reduction of inequalities in the provision of facilities (CSIR, 2000). Multi-purpose facility clusters should be located together with an urban settlement structural element such as a transport interchange, market, sports field or urban square.

### Public Facility Cluster Hierarchy

The concept of public facility clusters is a strongly hierarchical one. The different hierarchical levels that are used throughout the plan are shown in table 8. The hierarchy of clusters ranges from primary through to tertiary clusters. Contextualizing table 8 to the TRUP site, primary clusters will be public institutions and public service provision clusters. These will be located at primary nodal and movement interchanges. Secondary clusters will include schools, public transport terminals, shops, and sports/park facilities. Tertiary clusters will be developed in the precinct development plans, which will follow from this

SDF. They will include community gardens and small-scale shared facilities and spaces.

HIERARCHY	FACILITIES	LAYOUT	EXAMPLE
<b>PRIMARY</b> These facilities serve an entire region, metropolitan or city such as hospitals and universities. They are located at the most accessible location where the greatest number of people will have access to.	Public transport interchange Hospital Community centre and mall Library and information centre Tertiary education + secondary school + primary school + clinics Market square and economic infrastructure		
<b>SECONDARY</b> These facilities serve a number of different communities such as high schools and clinics. They are essential for settlements and serve a residential population that exceeds a single settlement.	Public transport terminal Secondary school + primary school + clinic Sports field Library and information centre Clinic Park		
<b>TERTIARY</b> These facilities are utilized by a limited number of residents of communities such as pre-primary schools. They are provided for in the layout of residential settlements.	Public transport terminal Primary school + clinic Clinic Community vegetable garden Kick-about/pool		

**LEGEND**

- Social Facility
- Community Garden/Park
- Public Transport Interchange
- Public Square
- Sports Field
- Public Road/Highway

Table 8: Hierarchy of Public facilities (Source: Author; CSRI, 2000; City of Cape Town, 1999; CNdV Africa Planning and Design, 2013).

## CATO MANOR, DURBAN

The Cato Manor development in Durban was envisaged as a cluster of medium and high-density suburbs with the necessary shops, clinics, schools and recreational facilities that are centrally located and serviced by an efficient public transport system (CMDA, 2015). It is a good example of successful implementation of a hierarchy of multi-purpose facility clusters.



Figure 74:  
Clustering of  
Public Facilities in  
Cato Manor,  
Durban (Source:  
CMDA, 2015)

### 4.12.2 Keep Assets Intact: Protect Valuable Natural Resources/Ecological River Corridors

The CoCT, as previously mentioned, is rich in natural resources. These resources include rivers, waterbodies and their associated ecological support areas, soils, biodiversity, and geology to name a few. These resources are assets to the city in the sense that they provide a range of benefits and attractions for people who live in Cape Town. Furthermore, if carefully analyzed and protected, they are major informants to urban growth and development and the changing shape of the growing city. There are a number of ecological assets, such as waterbodies, wetlands, and associated ecological support areas on the TRUP site which make it an attractive place to live, play, and work.

These ecological assets will provide the basis from which urban development will be informed. For the purposes of this SDF, urban development should exhibit respect and responsibility in protecting, enhancing, restoring, and rehabilitating the natural ecological assets on the site. In this way, the placement of new urban development will be directly informed by the presence of these assets, respecting their presence, location, role, and function. Furthermore, urban development should aim to maximize on the potential benefits of these assets for residents and visitors. For this reason, the natural environmental quality of

the site should be managed carefully in relation to future development in order to develop and promote a healthy socio-ecological system, in which urban growth is sustainably managed.

Furthermore, the contextual analysis in chapter 3 revealed that there are a number of heritage resources on the TRUP site. These are also assets which need to be kept intact and managed well.

#### 4.12.2.1 Manage Natural Assets: Restore, Protect, and Enhance

The Natural Assets on the TRUP site are shown in figure 75. These form the environmental basis for the SDF and reflect the environmental management priorities.

In order to ensure policy alignment at a number of scales, natural assets on the site are categorized based on their underlying environmental significance using the same open space categories used in the TBPDF (2012). This land use classification system, and its associated categories, are also consistent with the bioregional planning framework and spatial planning categories used to designate environmental management zones in the PSDF (2009) and the CoCT SDF (2011).

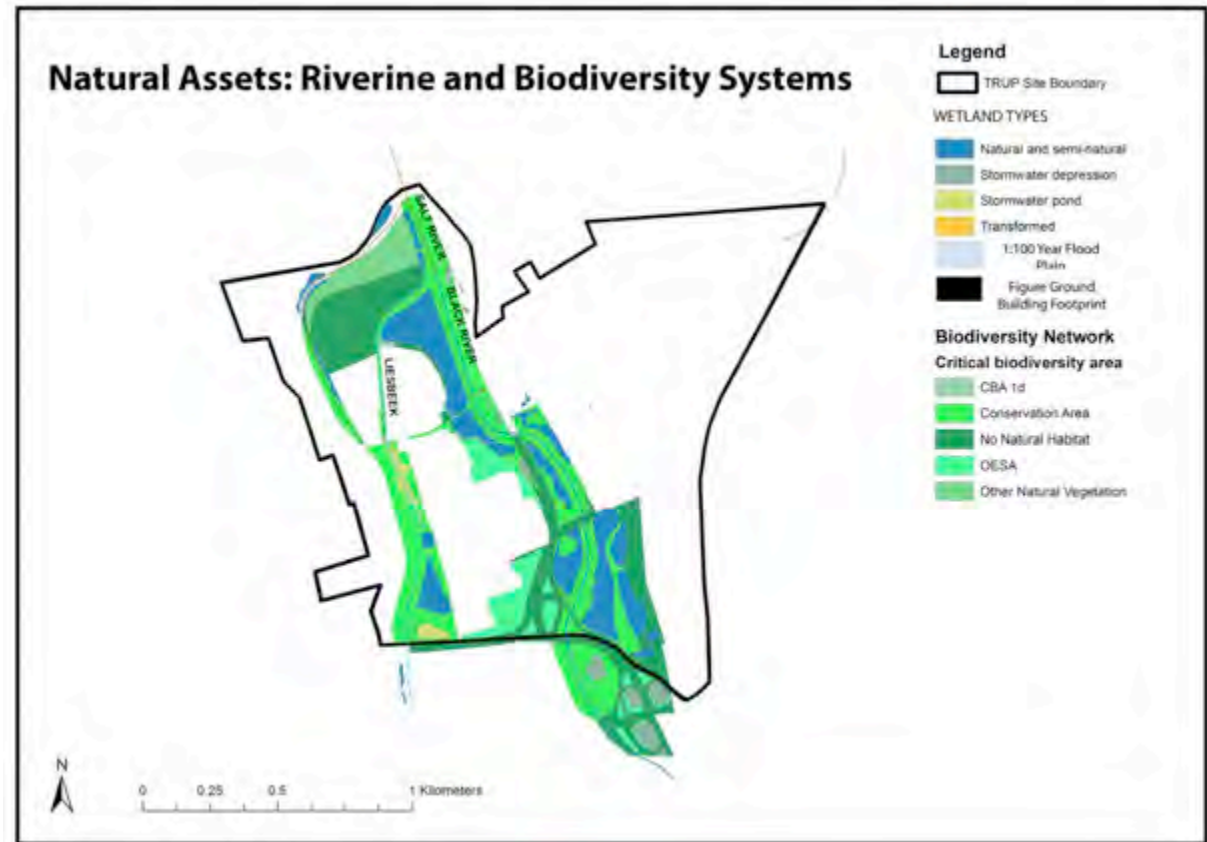


Figure 75: Natural Assets: Riverine And Biodiversity Systems (Source: Author, 2016, GIS, University of Cape Town Technical Libraries, 2016)

These land use management categories are concerned with the management of impacts. In this context, the management of impacts on the riverine and its associated ecological corridor, is associated with eliminating negative environmental impacts and moving towards net-positive gains for the natural environment. As such, these

categories, or natural land use management units which demand different management and development approaches, are explained as follows (shown in figure 76):



Figure 76: Natural Land Management Unit Classification (Source: Author, 2016, GIS, University of Cape Town Technical Libraries, 2016)

### Core 1

These include formal and statutory conservation areas, including protected and managed critical biodiversity areas, as defined by the CoCT Biodiversity Network (TBSFEMF, 2012).

Core 2 These areas, according to the TBSDFEMF (2012), include ecological corridors, critical ecological support areas (CESAs), rivers, wetlands, and flood risk/ floodplain zones.

### Buffer 1

This category includes intensive agricultural areas as well as other natural vegetation which is not included in the core areas or which does not have formal protection or critical biodiversity status (TBSDFEMF, 2012).

### Buffer 2

These areas are predominantly transformed agricultural land and rural areas which do not qualify as

core areas (TBSDFEMF, 2012).

### Intensive Agriculture

These areas are those of significant agricultural value or significance. This significance may be as a result of their existing use or their future potential (TBSEDFEMF, 2012).

These spatial planning categories, or natural land use management units, as they relate to the proposed SDF of the TRUP site, are shown in figure 76. Each category and zone requires its own specific guidelines and management approach. The approach and guidelines for the management of each zone are explained in table 9 below.

Asset Management Unit Classification	District Development Guidelines	Desirable Activities/ Uses/ Development	Undesirable Activities/ Uses/ Development	Development Integration Consideration
The Black River	Restore, enhance, protect, rehabilitate	Conservation, Rehabilitation, Protection activities are deemed most appropriate to increase water quality and manage pollution from runoff, industry, and a lack of sanitation	Continued pollution and contamination or any activity which threatens the quality of the riverine system, vegetation cover, or hydrological functioning of the river	No-Go zone for development, except for the purposes of conservational and recreational use as an urban park
The Liesbeek River	Restore, enhance, protect, rehabilitate	Protect, rehabilitate, and restore this river to its natural state by removing canalization as far as possible to use for recreational activities	Continued pollution and contamination or any activity which threatens the quality of the riverine system or the water	No-Go zone for development, except for the purposes of conservational and recreational use as an urban park

Core 1/ The Rivers, Protected Areas	1. Activities in these areas should focus on conservation use with conservation management activities (e.g. alien clearing, research) encouraged.	Conservation activities, activities necessary for the management and conservation of the area, hiking trails and walks, viewpoints for recreational activities, zero or positive impact recreational activities	Any land use or activity that will have a negative impact on the vegetation cover or ecological functioning of the area	No-Go Urban Development Zone
	2. In general, low impact activities such as passive recreation (eg walkways and trails), environmental education and tourism may be appropriate, but should be subject to stringent controls, (e.g. limits to development footprint, management plans).			
	3. Where possible, all new utility infrastructure, services and structures should be located outside of these areas.			
	4. Formalised reserves and sites (e.g. IMNF) should be regarded as „no-go“ areas and no further development of any kind should be allowed in these areas without a detailed assessment of the impacts.			
	5. Further subdivision of these areas should generally be discouraged and consolidation encouraged.			
	6. Reference should be made to the EMF's conservation and biodiversity priority zone and specific environmental attribute detail for further guidance around the potential desirability of specific activities.			

Core 2/ Critical Biodiversity Areas, Critical Ecological Support Areas	1. Activities in these areas should focus on conservation use with conservation management activities (e.g. alien clearing, research) encouraged.	Conservation activities, activities necessary for the management and conservation of the area, hiking trails and walks, viewpoints for recreational activities, zero or positive impact recreational activities, urban open space areas with appropriate zero or positive impact recreational activities	Any land use or activity that will have a negative impact on the vegetation cover or ecological functioning of the area, any land use and activity that will change the existing use or activity or harden the surface of the site	No-Go Development Zones
	2. In general, low impact activities such as passive recreation (e.g. walkways and trails), environmental education and tourism may be appropriate, but should be subject to stringent controls (e.g. limits to development footprint, management plans).			
	3. Where possible, all new utility infrastructure, services and structures should be located outside of these areas.			
	4. Sites indicated as Core 2, but which also fall within identified precautionary areas (i.e. flood-prone areas) should take into account district development guidelines identified for these areas.			
	5. Maintain and enhance mountain to sea linkages, especially along river courses. This should include efforts to improve amenity value of these areas and encouraging positive interfaces (e.g. through building orientation, permeable fencing) between abutting development and open space systems.			
	6. Further extension of agricultural activity, beyond existing uses and rights within these areas should generally be discouraged.			
	7. Reference should be made to the EMF's conservation and biodiversity priority zone and specific environmental attribute detail for further guidance around the desirability of specific activities in these areas.			

Buffer 1/ Other Ecological Support Areas, Other Natural Vegetation Areas	1. Low impact activities (as per Core 1/2) may be appropriate.	Conservation activities, activities necessary for the management and conservation of the area, hiking trails and walks, viewpoints for recreational activities, zero or positive impact recreational activities, urban open space areas with appropriate zero or positive impact recreational activities	Any land use or activity that will have a negative impact on the vegetation cover or ecological functioning of the area, any land use and activity that will change the existing use or activity or harden the surface of the site	Should Avoid Development, allow for zero or positive impact development proposals which do not change or harden the surface of the existing land use or land
	2. Development (e.g. structures) in support of both tourism and biodiversity conservation in Core Areas should preferably be located in Buffer 1 and 2 areas if logistically feasible.			
Buffer 2/ Open Space, Urban Park, Other Green Areas	3. Extensive agricultural activities occurring in these areas, and which may impact on remnant natural vegetation should adopt low impact practices (e.g. rotational grazing / resting cycles).	Active and passive recreational activities, education and research activities, pilot projects towards sustainability and innovation and connecting humans and nature, community engagement and recreational areas, tourism	Development which threatens the permeability of, access to, or quality of urban green open space/ the urban park	No-Go for intense urban development. May include development relating to education and research and recreational activities and/or approved pilot projects to connect humans and nature
	4. Reference should be made to the EMF's conservation and biodiversity priority zone and specific environmental attribute detail for further guidance around the desirability of specific activities in these areas.			
	1. Low impact activities (as per Core 1/2) may be appropriate.			
	2. Development (e.g. structures) in support of both tourism and biodiversity conservation in Core Areas should preferably be located in Buffer 1 and 2 areas if logistically feasible.			
	3. Furthermore, agricultural use could be considered appropriate in these areas as well as uses or activities directly relating to the agricultural enterprise. This could include farm buildings and farm worker accommodation.			
	4. Further uses and activities could be considered where contextually appropriate such as small scale holiday accommodation, restaurants, farm stall / shop and tourist facilities.			
5. Non agricultural uses (e.g. those specified above) should be managed through spot rezoning or consent uses and fragmentation of farm units should be discouraged.				
6. Reference should be made to the EMF's conservation and biodiversity priority zone and specific environmental attribute detail for further guidance around the desirability of specific activities in these areas.				

Intensive Agriculture	To form a second buffer to manage stormwater runoff and protect core areas	Urban food production, edible gardens, community engagement areas	Urban Development	No-Go development zones, but zones of activity
Heritage Areas	Protect character and value of heritage assets through good maintenance and management, urban design, and through preserving cultural and heritage senses of place. Applications subject to the National Heritage Resources Act requirements	Residential, commercial, and mixed-use activities that maintain the character of the area, restoration and conservation of historic buildings infrastructure and activities, public open space	Any alterations, additions, or new structures which are unsympathetic to protected buildings or the character of the area, inappropriate landscaping, signage, industrial activities etc	Develop With Care Zone

Table 9: Guidelines for Natural Land Management Units (Source: Author, 2016, TBDSFEMF, 2012)

#### 4.12.2.2 Retain and Develop Continuous Open Space Corridors as Green Infrastructure Linkages

The current open space corridor (MOSS) which runs through the city from Table Bay to False Bay will be retained and developed as a key green infrastructure project for the city. The open space around the two rivers on the TRUP site are a vital link in this system and should be developed as such. The advantages to the development of this green infrastructure, which will be developed in the form of environmental management and an urban park, will be increased stormwater retention and the continuity of the natural environment within the urban context.

#### 4.12.2.3 Restore and Rehabilitate Natural Resources to their Natural State

Natural resources, primarily associated with the river corridor and its associated wetlands and biodiversity, should be rehabilitated and restored to a natural and healthy state as far as possible. This involves the decanalization of the Liesbeek River, the removal of alien plant species, and the elimination of pollutants from the rivers. Furthermore, the rivers will need to be rehabilitated before development can interact positively with them. This is especially the case for the Black River, which is currently unfit for human contact. This intervention will involve specialist studies and sound natural resource management in order to improve the quality of the overall natural resource base.

#### 4.12.2.4 Protect the Natural Assets and Ecological Corridor

Once the natural assets on the site have been rehabilitated and restored, they will require constant and continuous protection. This will occur through educational initiatives which seek innovative ways to protect natural resources. A move to net-positive development will ensure protection, with the use of a strongly imposed urban development edge (an example is shown in figure 77) to define the developable land areas and ensure that development does not occur at the expense of the natural environment.



Figure 77: Urban development Edge Example from the TBSDFEMF (2012)

This development edge will contain development in suitable areas. The only types of development permitted beyond the urban edge is development associated with recreation, agriculture, eco-tourism, and conservation (decided through an application process). Protection of the river corridor system will be accomplished through careful identification and elimination of pollutants and discharges from urban development. Furthermore, stormwater runoff will be creatively managed (for example through maximizing permeable surfaces to retain water and return it to the ground-water reserve).

The natural assets will also be protected through the implementation of a multi-tiered buffer area, which will function as public open space and will include agricultural activities and an urban park as buffers between development and nature. The schematic representation of buffers is shown in figure 78.

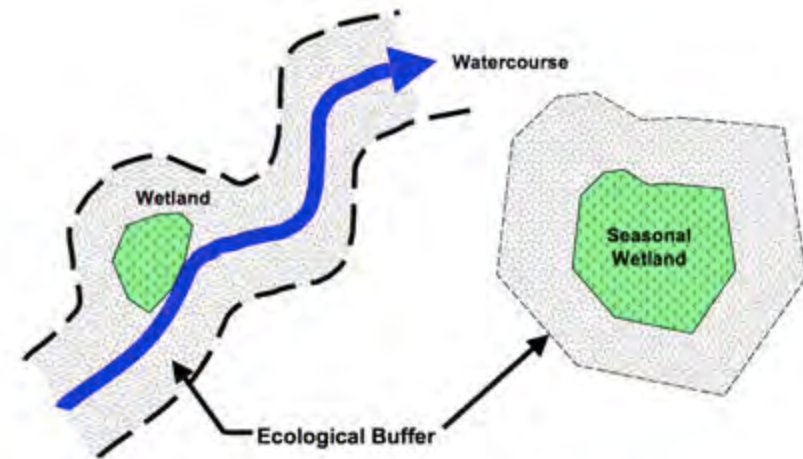


Figure 3: Schematic representation of ecological buffers

Figure 78: Schematic Representation of Buffers (Source: TBSDFEMF, 2012)

These buffers, rather than being no-go zones for people, will become active and passive recreation and conservation sites to connect people and nature and integrate communities. In this way, the multi-tiered buffer system will be structured as follows:

Primary buffers, immediately surrounding core areas, will include biodiversity areas, protected areas, and critical ecological support areas. Secondary buffers will include

other ecological support areas and natural vegetation. Tertiary buffers will include a high-quality green open space park, and the final buffer layer will consist of agricultural areas for food production and increased security. These buffers allow for spaces of learning and experimentation through different ways of conceptualizing conservation which does not separate nature from humans and development. They will also allow for increased water retention and the protection of critical ecological resources as the base for providing ecosystem goods and services. The three-tiered buffer system that is proposed is shown in figure 79 below.

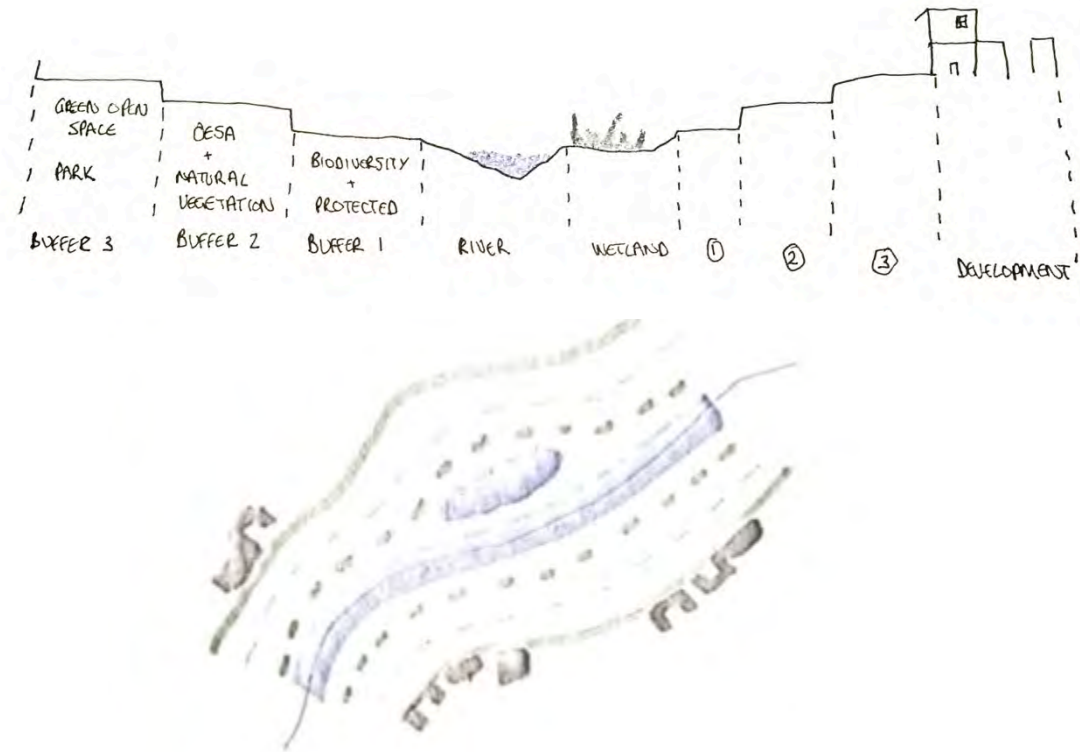


Figure 79: Three-Tiered Buffer System Illustration (Source: Author, 2016)

#### 4.12.2.5 Enhance the Quality and Vibrance of the Natural Public Open Space System

The natural assets on the site, as well as their associated buffers should be enhanced to maximize the potential of the site to provide high-quality public and green spaces. The presence of these assets will be celebrated and innovative ways to enhance their quality and potential will actively be sought out. These spaces should become

vibrant areas for people to enjoy nature, interact, and experience the outdoors in the urban context. This enhancement will be done through the implementation of pedestrian pathways to access different areas of the natural environment and urban park. Additionally, recreational, conservation, and eco-tourism activities will enhance the public space system to make it accessible and enjoyable for a range of activities. This intervention is in line with the MOSS for the CoCT.

#### 4.12.2.6 Manage Heritage and Cultural Assets

The development of precinct plans and strong urban design frameworks will ensure heritage and culture-sensitive development. Heritage buildings will be retained and repurposed in cases where their use will change (such as the buildings on the Valkenberg West site, once the hospital has moved to the Alexandra Precinct over time, as is proposed by this SDF to repurpose the original site and make it permeable, while allowing for intensified development). The culture and historical character of the area will be protected, and preserved through heritage guidelines and the management of a sense of place around heritage areas of significance.

#### 4.12.3 Manage Urban Growth Sustainably By Enabling a Balance Between Urban Development (Humans) and the Natural Environment (Nature)

The management of both urban growth and the natural environment should be done in such a way that a balance between the two is achieved. In order to protect natural assets on the site and keep them in tact, urban development will be strategically located away from them in areas which are regarded suitable, with guidelines to ensure that the development reduces impact, or even has a positive impact on the natural environment. It has already been acknowledged, earlier on in this dissertation, that spatial planning, in the Cape Town context, is mandated to respond to both the need for infill, intensified, and densified development and the need for environmental protection of natural assets. Furthermore, the TRUP site provides the opportunity to balance the two, allowing for suitable positive development as well as protection and enhancement of the natural environment and assets. This SDF proposes that the natural assets on the TRUP site be restored, enhanced and rehabilitated to provide a "green lung" and continuous network of biodiversity and public open space throughout the city. This will be done with the proposal for an urban park on the site. At a site scale, this means that although densification and urban development will be proposed in suitable areas, a significant portion of the site, specifically along the

ecological river corridor system, will remain undeveloped and will be restored to its natural state, with an inseparable connection to the urban development. Rather than separating the two, this SDF proposes that the two be integrated throughout the site, with high levels of access to public open space and recreational activities.

#### 4.12.3.1 Enable permeable and Integrated Urban- Ecological Interfaces

This intervention is concerned with providing defined edges to open space, primarily the urban park. In this way, new development on the edges of the park will face the parkland to define the space and provide passive surveillance. This will provide active interfaces between development and the natural environment. Furthermore, these edges should be permeable and accessible and foster movement from developed areas into and across the park.

#### 4.12.3.2 Identify Areas Suitable for Future Urban Growth

This SDF will create integrated urban development in areas which are suitable to development, shown in figure 80.

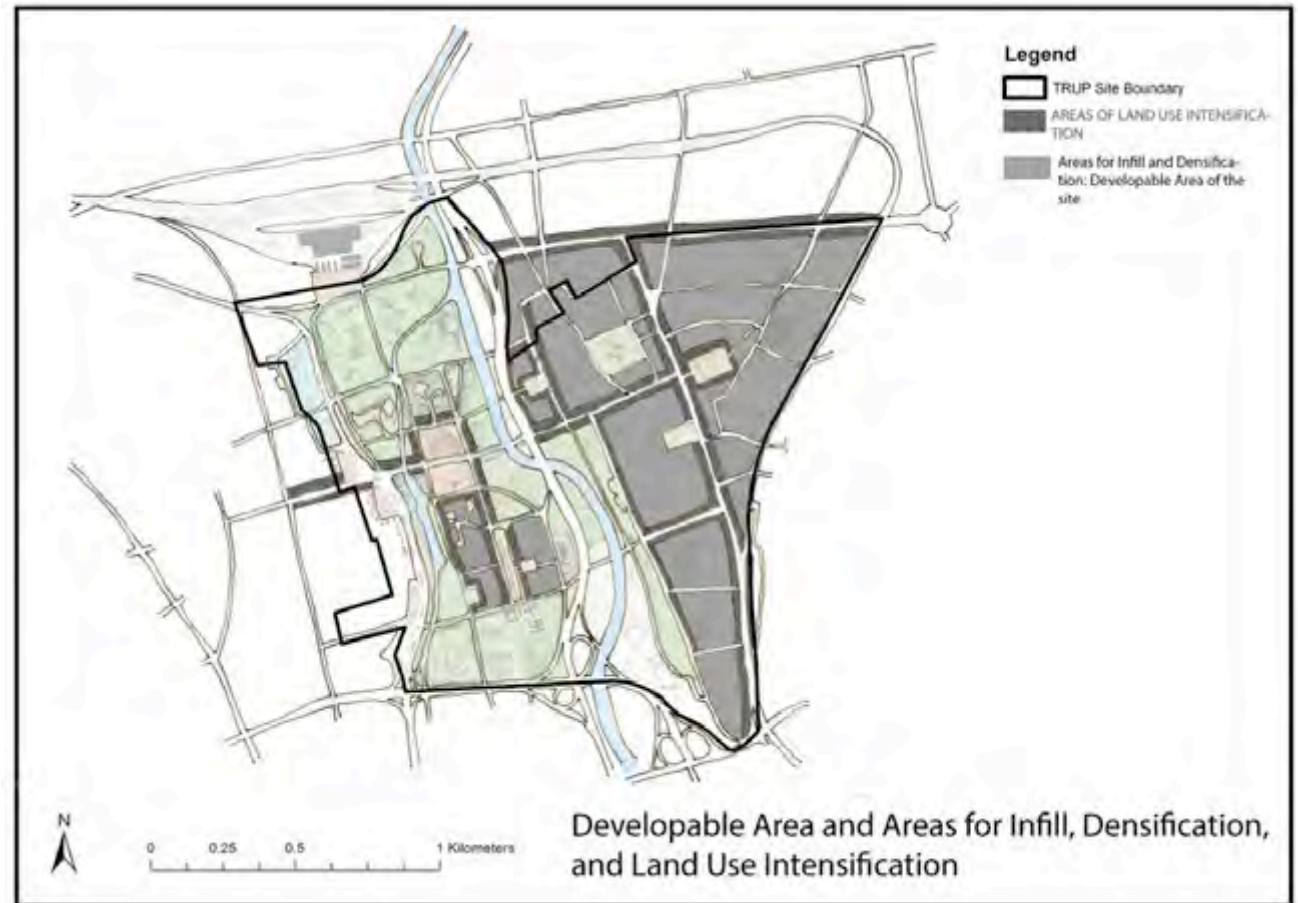


Figure 80: Developable Area and Areas for Infill, Densification, and Land Use Intensification (Source: Author, 2016)

These future urban growth areas will seek to maintain a balance between development and nature through the provision of infrastructure to support ecological goods and services. These urban growth areas will counteract lost space and will provide the necessary area for net-positive development to be experimented with and tested at a number of densities.

#### 4.12.3.3 Promote and Enable Infill Development, Densification, and Land Use Intensification

The densification, infill, and land use intensification in future urban growth areas is therefore necessary. This intervention seeks to make the best use of available land. Infill development will occur on sites which are currently not used or underutilized. Densification will happen throughout the site, but primarily along access routes. Land use intensification is encouraged in order to provide the necessary densities for public transport to be viable and for the development of strong communities.

#### 4.12.3.4 Expand Housing Opportunities

New development areas should seek to provide a diverse range of housing and tenure opportunities to ensure that a sustainable mix of races, people, incomes etc can be accommodated on the site. These housing and tenure

opportunities should seek to offer innovative housing provision through a number of pilot projects for subsidized land, self-build homes, and permacultural eco-village-type ownership and housing.

#### 4.12.3.5 Create Urban Development Edges

As previously mentioned, an urban development edge will be established to contain development from sprawling into natural and open space areas. This edge will be a form of environmental protection and will define limits to development. This edge should be considered for inclusion in the CoCTSDF as being part of the urban edge. Developments beyond this edge will have to prove net-positive gains for the natural environment and should be considered on an application basis, only if they are concerned with innovative sustainable urban design testing with a positive impact, conservation, eco-tourism, and recreation.

#### 4.12.3.6 Implement Urban Development Guidelines

The TBSDFEMF (2012) provides a number of guidelines for urban development on developable land. They are provided in table 10 and should be considered for the purposes of this SDF.

<b>f. Urban development</b>	General (all areas)	<ol style="list-style-type: none"> <li>1. These areas should be considered for a wide variety of urban uses such as housing development, public open spaces, community facilities, mixed use / business development (where appropriate), but should not include noxious industrial uses.</li> <li>2. Sites indicated for urban development, but which also fall within identified precautionary areas should take into account associated district development guidelines.</li> <li>3. Sites indicated for urban development, but where conflict occurs with natural ecosystems (e.g. critical biodiversity areas) should be subject to EIA processes which take into account principles for dealing with development proposals in conflict areas (see annexure). In the Table Bay District the main example of such a case is Wingfield.</li> </ol>
	Existing developed urban areas	<ol style="list-style-type: none"> <li>4. Support the incremental densification over time of urban areas where appropriate, for example along the Voortrekker Road corridor. This should be guided by available infrastructure capacity, neighbourhood density and character, proximity to job opportunities and social facilities, and access to public transport.</li> <li>5. Consider the existing character and heritage value of areas of significance (as may be reflected in detailed policies) as an informant to development and redevelopment proposals.</li> </ol>

Table 10: Urban Development Guidelines (Source: TBSDFEMF, 2012)

#### 4.12.3.7 Urban Development Considerations

All urban development should consider the natural environment as being an integral part of any development proposal. Its presence should be maximized. The largest urban development consideration for the development of the TRUP site is maintaining a balance, innovatively, between the urban and natural environment in an attempt to bring nature into the everyday lives of people through a number of pilot projects and innovative and creative

developments which showcase a strong concern for human-nature relationships and indicate a move towards a paradigm shift in the ways in which development and nature are integrated in urban areas. This will be enabled by designing with and for nature and emulating natural ecosystems with the highest level of respect, as though nature was a subject of rights.

#### Stormwater Management

Stormwater runoff, which is a major river pollutant, will be minimized through ensuring permeable surfaces as far as possible. This will allow stormwater to be retained by development and will allow it to seep into the ground, providing for the increased presence of nature and returning it to the groundwater system. The management of stormwater and its retention for use by development should be further explored in a specialist study and proposal.

#### Floodplain management

Because a large portion of the site falls within the 1:100 year floodline, a strategy for floodplain management and risk and disaster management must be developed. The modelling of floodlines requires more consistency and should also be developed comprehensively through a similar strategy. Generally, development will be guided

away from flood-zones. Potential buyers of land for development in flood-prone areas should be made aware of the facts before purchasing land so they are aware of the potential risks involved with developing it.

#### 4.12.3.8 Urban Design Considerations and Principles

The next stage of the development process is to create a plan on a smaller scale which would include an urban design framework for the site and principles of good settlement making which would aid in making the site safe, vibrant, and liveable. The plans should include the following broad urban design guidelines and principles in order to create a sustainable, vibrant, and liveable environment:

- Perimeter block development where a hierarchy of space is established and where the thresholds between public and private space are clear and where community areas can be provided in safe spaces. The communal open space created by the perimeter housing provides the opportunity for a range of activities such as parking, hard open space, soft open space or community gardens. Figure 81 shows variations in perimeter block layout and types of courtyards uses.



Figure 81: Perimeter Block Housing Typologies (Source: Botha, 2015)

- Clear Transitions from Public to Private Space (shown in figure 82), with public space on the streets, semi-public, semi-private spaces in front gardens and on porches, and private spaces in the houses, in courtyards, and in back gardens

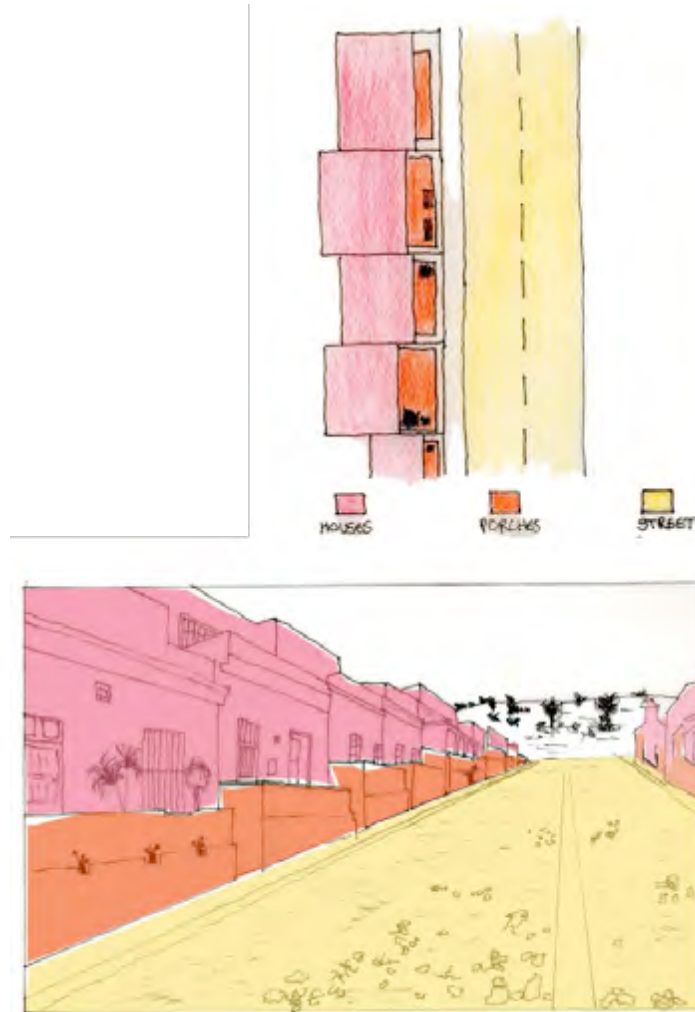


Figure 82: Public-Private Space Transitions (Source: Author, 2016)

- Active street frontage to maximize safety and enhance and define the public and pedestrian

realm. This will provide passive surveillance, too

- Large amounts of vegetation and plant life as far as possible
- Rooftop gardens, vertical gardens along walls, and personal vegetable gardens will be encouraged and made mandatory
- Innovative and sustainable projects and initiatives will be favored
- Building heights will vary from 1-2 stories for residential, 2-3 for mixed use areas, and 3-4 for commercial areas
- Personalization and creativity will be encouraged and promoted through color and personal expression, so long as it is true to the heritage character of the area
- Housing will take precedent from the typologies found in the Bo-Kaap.
- Limits on erf sizes and housing unit sizes will be imposed to achieve desired densities and ensure sustainability
- The development of the site will follow the green ecological principles in development considerations

- Live, Work, Play environment will be enabled
  - Building performance must be exemplary and “green”. This will be achieved in a number of ways, which ensure net-positive impacts and provide testable models for replicability and retrofitting in other urban areas. These ways include, but are not limited to:

#### ENERGY EFFICIENCY

Buildings should optimize thermal performance, thermal comfort and daylight. Measures need to be put in place to reduce the need for mechanical heating and cooling, and to minimize greenhouse gas emissions. Controls include the incorporation of passive solar design techniques to optimize heat storage, using insulation in roofs/ ceilings and external walls, maximizing natural ventilation and using thermal mass in floors and walls that are situated in the northern side of buildings (ASM Consortium, 2008).

#### WASTE

The minimization and management of waste can contribute towards the visual amenity of buildings and limit harmful impacts on the environment. Minimizing waste should be relevant to all stages of a building’s life-cycle. Controls include encouraging waste minimization by reusing and recycling waste, on-site composting to be used for agriculture and the integration of waste management

process in all stages of building construction (ASM Consortium, 2008).

#### WATER CONSERVATION

Improved water efficiency should be promoted to reduce potable water demand by re-using water that would otherwise be lost as waste water or run-off. Controls include the requirement of harvesting rainwater through rainwater tanks, urban storm water runoff through retention ponds and grey-water utilization for landscape and agricultural irrigation (ASM Consortium, 2008).

#### 4.12.4 Ensure Adequate Provision of High-Quality Public Green Open Spaces and Integrate these with the Development

The abundance of open space on the TRUP site presents opportunities for providing a high-quality green public open space environment. Open spaces on the site that are not suitable for urban development will be upgraded and rationalized in order to improve the functioning of the overall open space network and biodiversity network in the city. Furthermore, at a site scale, a continuous network of public open spaces should be provided. These spaces should be well-integrated with urban development and should be highly accessible as important spaces for community engagement and interaction to occur.

Guidelines for the provision of these public spaces, as proposed by the TBSEDFEMF (2012), is provided in table 11.

<p><b>e. Other structuring open space</b></p>	<ul style="list-style-type: none"> <li>• Green Point Common/ Urban Park</li> <li>• Deer Park/ De Waal Park/ Company's Gardens</li> <li>• Trafalgar Park</li> <li>• Two Rivers Urban Park</li> <li>• Open space associated with Elsieskraal canal system</li> <li>• Open space/ sports</li> </ul>	<ol style="list-style-type: none"> <li>1. In general, avoid development of these areas in a manner that would compromise open space linkage.</li> <li>2. Encourage development to respond to and promote opportunities for linkage between identified structuring open space in developed areas. (e.g. the Trafalgar Park link in District Six area)</li> <li>3. In general, development adjacent to open spaces, or which rationalises these spaces, should be orientated towards the open space to encourage the use and passive surveillance of these areas. Design which compromises this condition (e.g. excessive blank walls and backing of development onto these spaces) should be discouraged.</li> <li>4. Subject to contextual informants, medium density</li> </ol>
	<ul style="list-style-type: none"> <li>• fields in Kensington</li> <li>• Open space along Viking Way</li> <li>• Proposed public open space corridor in Wingfield</li> </ul>	<ol style="list-style-type: none"> <li>development (e.g. 2/3 storey development) along open space interfaces could be considered to improve passive surveillance.</li> <li>5. Safety and security should be considered in the upgrading, landscaping or development of public open spaces.</li> <li>6. Where contextually appropriate, consider commercial activities such as small cafes, kiosks and restaurants that will enhance the open space.</li> <li>7. Where feasible, opportunities for low impact sustainable use of open spaces, by local communities, should be considered (e.g. small scale urban agriculture) but this should take into account the wider access / linkage needs and public open space provision requirements.</li> </ol>

Table 11: Guidelines for the Provision of Public Green Open Spaces (Source: TBSEDFEMF, 2012)

#### 4.12.4.1 Create a Clear Hierarchy Of Public Spaces

The development framework incorporates a hierarchy of public open spaces that are linked with movement routes and located at points of high accessibility. This hierarchy gives order to activities. Public facilities should be associated with public spaces and be orientated around the edges of public spaces (City of Cape Town, 1999).

The primary public space in this framework will be the creation of an urban park along the river corridor. This large tract of public open space will be framed by development edges, which will provide a defining outline to the park. The park will be directly linked, through a network of landscaped, green movement routes, to a series of secondary public spaces. The most important of these spaces will be the main public squares along the proposed extension of Station Road. The first, which will function as a market square, will be located as a focal entry point to the park between the two rivers. The second, will have a mixed-use institutional function, and will be located at the nodal point where the proposed extension to Station Road meets Alexandra Road. Figure 83 shows the hierarchies of public space as they relate to the concept, showing the public park, and secondary and tertiary spaces.



Figure 83: Hierarchy of Proposed Public Spaces (Source: Author, 2016)

Examples of public squares are shown in figures 84-86.



Figure 84:  
Informal Trading

(Source:<http://www.capetownpartnership.co.za/>)



Figure 85:  
Buildings Framing  
Public Square  
with Active  
Frontages

(Source:<https://commons.wikimedia.org>)



Figure 86: Public  
Buildings Faced  
onto Public  
Square

(Source:[http://www.snipview.com/q/Nearby:\\_Copenhagen\\_City\\_Hall](http://www.snipview.com/q/Nearby:_Copenhagen_City_Hall))

#### 4.12.4.2 Create a Healthy Natural Environment as an Urban Park

This SDF proposes that the Two Rivers Urban Park be formalized as a major component of the green open space and biodiversity network. It is proposed that this occurs as a reinforcement of accessible recreational and sporting activities, as well as active conservation of natural assets.

The Precedent for this strategy comes from the Centenary Park in Bulawayo Zimbabwe. While its current state is compromised due to a lack of funds and subsequent management, its original design is one worth replicating.

The park is situated along a river corridor which runs between the central city and the residential suburb of Suburbs. The park is dissected by Leopold Takawira Avenue, one of the major access routes into the city. The park, up until the rapid decline of the zimbabwean economy in 2008, functioned as a high-quality public space which was used by all people in the city of Bulwayo. The park consists of areas of beautiful natural flora and biodiversity, as well as a number of recreational activity zones. These include skating facilities, a legible pathway system to facilitate pedestrian movement, children's playgrounds, and picnic sites. There is a caravan park, the Natural History Museum, an outdoor amphitheatre, and the Bulwayo theatre on the site, as well as a large central fountain. In the past, when the park was well-managed, there was a small train which ran around the park, past the ducks in the ponds along the river, past a variety of flora and fauna, and past beautiful garden areas for a mix of activities. The park is bordered on one side by the high-density city center, and on the other by the green neighborhood of Suburbs, shown in figure 87. The park and surrounding are includes a number of schools, a caravan park, herbal gardens, sports fields, and a Polytechnic University. There is a noticeable green river corridor system along the river, which functions as the central park. The park is only accessible on foot and has the potential to function as a mixed-use area, as it once did, with support from its urban surroundings. The park, as well as the green

neighborhood of suburbs, with clear and accessible links to the inner city and a number of opportunities is a good precedent for the type of park which this framework aims to create.







Figure 87: Centenary Park, Bulawayo, Zimbabwe (Source: Author, 2016, Google Maps, 2016)

## GREEN POINT PARK, CAPE TOWN

Green Point Park is also a successful example of a multi-functional park, in Cape Town. The space includes biodiversity areas, a network of pedestrian and cycling pathways, an outdoor gym, picnic spaces and children's playground. The park also includes the Cape Town stadium.



### 4.12.5 Create a Green Neighborhood

Central to this SDF is the idea of a sustainable and “green” neighborhood. In this way, this neighborhood seeks to serve as a model for sustainable development, challenging development norms in the city that are unsustainable. This “green” neighborhood will be created in the following ways:

#### 4.12.5.1 Transition to Zero Waste

The new developments on the site should seek to transition to zero-waste. This will be achieved through recycling, and using waste as a resource, such that one person's waste, or an industry's waste becomes a resource for another.

#### 4.12.5.2 Promote Green and Ecologically-Sensitive Infrastructure

The infrastructure constraints of the site to support new development will be overcome with the use of innovative and "green" infrastructure techniques, separate from the city's grids. Each development proposal should include a plan as to how infrastructure will be provided sustainably to support the new development.

#### 4.12.5.3 Take Proposed Development Off-Grid: Use of Renewable Energy

The idea for this framework is that the new development will be off-grid, meaning that it will power itself with the use of renewable energy sources, such as bio-fuel, solar, and wind. Each new development should be self-sufficient in this way, with potential to sell excess power generated back to the city grid.

#### 4.12.5.4 Mandate Positive Development with Zero-Positive Environmental Impact

The new development on the site should, through design strategies, seek to have zero-negative impact on the natural environment. In this way, new developments will exhibit good-practice in enriching the natural environment through development. Positive development will be encouraged by incentives and will be enforced through the EIA process.

#### 4.12.5.5 Encourage Food Production

Central to the theme of this SDF is the production of food on the site through organic agriculture initiatives to increase food security. Each intentional community should aim to be self-reliant in terms of agricultural produce, using vertical gardens, green roofs, and community vegetable gardens. Agriculture should be seen as a vital way to connect people and nature, and its activities and trading will contribute to a vibrant economy and community.

#### 4.12.6 Build an innovative, integrated, vibrant, inclusive, and sustainable eco-community as a Place of Learning

The SDF will be a guidance policy for the creation of innovative ways of living on the site which are sustainable and which, through trial and error, become a place of

learning and research for how sustainability can be better understood in the realm of practical application. The community will have the following characteristics:

#### 4.12.6.1 Ensure a Social Mix of People

The development should attract a diverse mix of people from different races, backgrounds, income groups, and classes. This social mix will provide a transformative space which challenges the norms created by Apartheid spatial policies of separation.

#### 4.12.6.2 Build an Inclusive, Sustainable, Diverse Local Economy

An inclusive, diverse, and sustainable local economy should be promoted, which challenges consumerist and profit and market-driven approaches. This local economy will be developed through non-invasive and positive-impact techniques and through the promotion of creative, entrepreneurial, and artisanal business activities, as well as small scale agriculture exchanges of crops and products grown and made on the site.

#### Local Economic Development (LED)

LED aims to target previously disadvantaged individuals and communities and stimulate economic growth and

development by creating jobs in the local economy. It involves partnerships between businesses, communities, and government to build local area economies and create job opportunities. The opportunities created should be directly matched to the community and people in the community and should be based on the local economic context. It is suggested that a LED strategy be drawn up for the TRUP site in order to lay out a framework for promoting small and medium locally owned and entrepreneurial businesses and jobs. These jobs will be based on the skills of the community and support should be given to startups of this kind. This strategy should include provisions for the informal economy to thrive on the site, as a recognized legitimate form of income and livelihood. Support for small businesses could be in the form of formal registration for business which otherwise would not qualify and access to informal small loans, as well as skills development, supporting skills that can benefit the community and increase the sustainability of the local area as a whole.

#### 4.12.6.3 Support and Promote Skill Development

Skills development will be supported by providing innovative places for teaching and learning. Furthermore, provisions will be made for upskilling and for the protection of craftsmanship-type skills.

#### 4.12.6.4 Allow the Informal Economy to Thrive

Part of developing a vibrant local economy is providing spaces and formalization for the informal economy to thrive and become legitimized as a provider of livelihoods and incomes. These informal trading activities will be located in public areas and should promote the trading of artisanal, craft-type products and agriculture. These activities could be extended to include clothing exchanges and the exchange of different products made on the site. Infrastructure for the informal economy to thrive will be provided, primarily in public squares and nodal areas of high activity levels.

#### 4.12.6.5 Provide Support for Small-Medium Entrepreneurial Enterprises

Support will be provided for small-medium entrepreneurial enterprises by prioritizing economic opportunities for such business to thrive. Red-tape removal strategies should be implemented in order to legitimize and formalize these types of businesses and give them access to finance, funding, and skills development. This support will be coordinated through a SMEE business center and fund which is subsidized by corporates in the broader city region. This promotes and enables the development of new and creative ways of making money and creating livelihoods through skills which are specific to the local context.

Businesses in the green building and energy, sustainability, and environmental management sectors will be prioritized. Facilities offering different tenure options should be provided for these businesses.

#### 4.12.6.6 Create and Build a Series of Intentional Communities



Figure 88: Plan of Lynedoch Eco-Village (Source: <http://www.liane-network.org/?project=sustainable-development-step-2-best-practice-case-studies>)

This paper uses the Lynedoch EcoVillage development in Stellenbosch (near Cape Town) to demonstrate that this SDF can result in a balance between growth, equity and sustainability without any one of these criteria being seen as less or more important. In practice, however, judgments need to be made, and original intentions are often thwarted by conditions as they emerge during the course of the development process (Swilling. Lynedoch EcoVillage is a significant case because it is the first intentional, socially mixed ecologically designed urban development in the South African context, shown in figures 88 and 89. To this extent, the Lynedoch Development is a challenge to both the traditional unsustainable approaches to urban design and infrastructure that have dominated the democratic period in South Africa since 1994, and to the perpetuation of economic apartheid whereby the rich and poor have remained segregated.

The most significant aspect of Lynedoch from a sustainable design and construction point of view is that it provides a working example of integrated sustainable development: integrated because it connects social, economic and ecological objectives and because it incorporates technologies that span the energy, water, sanitation and



Figure 89: Lynedoch Eco-Village Residents (Source: Google Images)

building materials fields; sustainable because of the commitment to a long-term vision of social, economic and ecological sustainability; and developmental because of the anti-poverty and local economic development objectives.

The development of the TRUP site will encourage intentional community living and will test different models. These communities should have connections to one another, possibly with each one having a specific function in terms of exhibiting a specific aspect of sustainability. These intentional communities will be allowed to thrive, provided that they conform to required density standards. Land in buffer areas could be made available to such

communities on an application basis, provided that the applications are for the benefit of both people and nature. One such community is already located on the site in the Oude Molen Eco-Village. The activities in this intentional community should be extended, and developed further, in order to develop replicable models for sustainable development. These communities will be self-organized and will be governed and managed carefully, through cooperation and participation. It is intended that these intentional communities practice permaculture in order to legitimize it as a conscious attempt to make cities more sustainable. Therefore, permaculture should be enabled by planning and legitimized as a sustainable development model.

#### 4.12.6.7 Enable the Promotion of Permaculture

Permaculture, as defined by Holmgren (2002) as being *“Consciously designed landscapes which mimic the patterns and relationships found in nature, while yielding an abundance of food, fibre and energy for provision of local needs. People, their buildings and the ways in which they organise themselves are central to permaculture. Thus the permaculture vision of permanent or sustainable agriculture has evolved to one of permanent or sustainable culture.*

According to Holmgren (2002), starting with ethics and principles focused in the critical domain of land and nature

stewardship, permaculture is evolving by progressive application of principles to the integration of all seven domains necessary to sustain humanity through energy decent. The seven domains of permaculture are shown in figure 90.

The ethics and design principles which underpin the application of permaculture, and will be central to the development of the TRUP site are defined by Holmgren (2002) as follows:

#### Ethics:

- Care for the earth (husband soil, forests and water)
- Care for people (look after self, kin and community)
- Fair share (set limits to consumption and reproduction, and redistribute surplus)

#### Design Principles:

- Observe and Interact- careful observation and thoughtful interaction with nature
- Catch and Store Energy- use existing wealth to make long-term investments in natural capital
- Obtain a Yield- provide for self-reliance and intergenerational food and natural capital security
- Apply Self-regulation and Accept Feedback- understanding how positive and negative feedbacks work in nature to design self-regulating systems

- Use and Value Renewable Resources and Services- aim to make best use of renewable natural resources
- Produce No Waste- implement waste as a resource opportunities, recycle, and reduce reliance on plastics and materialism
- Design from Patterns to Detail- ensure commonalities between natural systems and social systems
- Integrate Rather than Segregate- nature as an integrated part of any development
- Use Slow and Small Solutions- design systems to perform at the smallest scale, testing and experimenting constantly
- Use and Value Diversity- ensure systematic complexity through variety of forms, functions, and interactions
- Use Edges and Value the Marginal- Ensure good health of socio-ecological interfaces
- Creatively Use and Respond to Change- ensure aggressive adaptability and resilience techniques

The above-mentioned ethics and principles outline and articulate a paradigm shift and cultural revolution towards understanding how organizational and social change can be creatively encouraged through adaptive and intentional change. According to Holmgren (2002: 22), “the butterfly, which is the transformation of a caterpillar, is a symbol for the idea of adaptive change that is uplifting rather than threatening.” The principles will underpin all

development designs for the site and will be used as a benchmark against which development applications will be assessed. Additionally, the ethics and principles will contribute to conscious and intentional social, political, and ecological ways of living in a way which is more integrated with natural systems. The principles of permaculture will be implemented in developable areas to build intentional eco-village type communities.

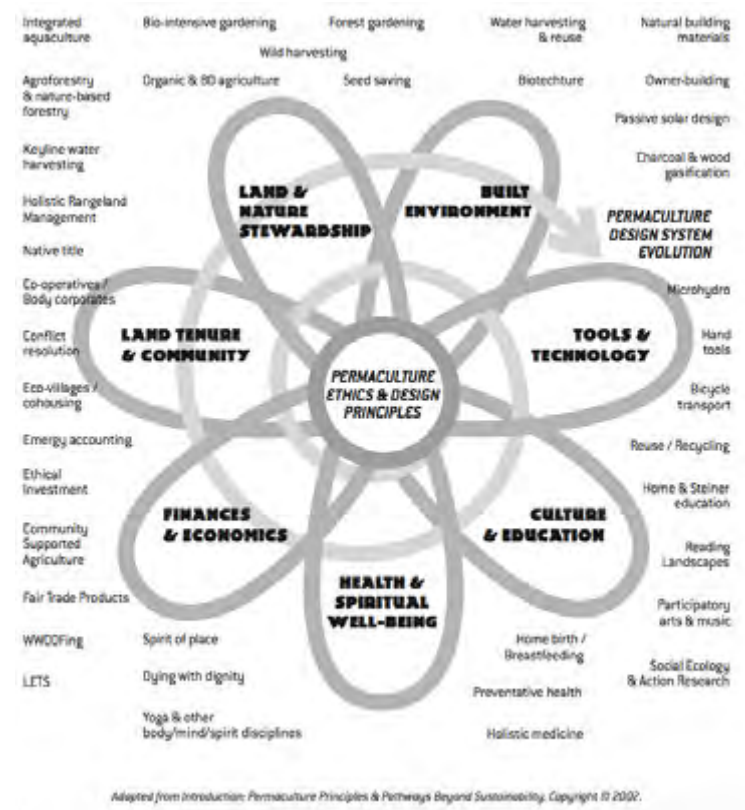


Figure 90: The Permaculture Flower (Source: Holmgren, 2002)

#### 4.12.6.8 Promote Innovative Project Testing: Bottom Up-Cooperation

As has already been mentioned, applications for development should be approved on the basis of their innovation. This SDF promotes the idea of trial and error in order to test different methods of developing with a positive impact on nature, and with close integration with its processes. In this way, research and learning will be enabled, and research can be used as a tool to guide and test different ways of living sustainably. The idea is that development applications should be approved if they are of an innovative pilot project nature, accepted at the discretion of a development management committee for the site.

#### 4.12.7 Enable a Strategic Mix of Land Uses to Facilitate Positive Development

A mix of land uses will be proposed for the development of the site, which will enable a live, play, work environment to thrive. This will mean that a range of activities, services, and functions are available and accessible within walking distance of each other. This idea also promotes the principle of self-reliance as the neighborhood should have “all that it needs” in terms of providing a range of social, ecological, institutional, and economic goods and services.

##### 4.12.7.1 Land Use

The land uses proposed for the SDF are articulated in table 12 and are shown in the final SDF (figure 98).

Land Use	Guidelines	Area	% of Total Site Area	Recommended Zoning
Residential	Housing projects- higher densities than single dwelling-unit plots	54ha	18%	General Residential 2
Industrial	Green Industry Activities	16.2ha	5.4%	General Industrial
Commercial	Business activities	18ha	6%	Local Business
Active and Passive Recreation and Conservation	Parkland and ecological riverine corridor system	72ha	24%	Open Space Zones 1 (riverine ecological corridor) and 3 (park)
Public Facilities and Institutions	Management facilities and public facilities	27ha	9%	Community and Utility
Public Open Space (Including Streets and transport infrastructure)	Excludes the parkland and ecological corridor. Movement system of open space and secondary public spaces and squares	46.8ha	15.6%	Transport and Open Space Zone 2
Mixed-Use	Mix of institutional, public, residential, commercial uses. Commercial and public/institutional usually on bottom floors, with residential above to ensure constant passive surveillance	33ha	11%	Mixed Use
Transport Interchanges and Nodes	Stations and associated public transport infrastructure and stops	4.5ha	1.50%	Transport
Urban Agriculture	Farming activities, urban and community gardens, public edible gardens etc.	28.5ha	9.5%	Agriculture
<b>Total</b>		<b>300ha</b>	<b>100%</b>	

Table 12: Proposed Land Uses and Zoning Considerations (Source: Author, 2016)

##### 4.12.7.2 Increase Densities

The density gradient that is used in the plan is seen in Figure 91. The highest density occurs along the higher-order activity routes and around the main public squares. This is needed to support public transport as well as to define open spaces. Medium density is located along the secondary activity corridors and around the secondary

public squares. The lowest densities are proposed in the residential areas and low-zero-impact eco-villages within the site. The required density guidelines are shown in table 13. Figure 92 then shows how these densities are spatially distributed on the site.

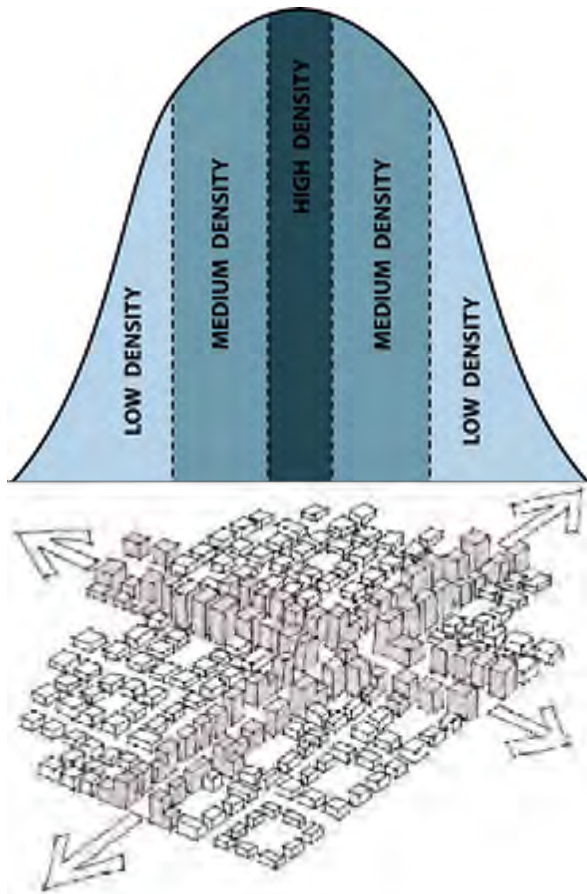


Figure 91: Density Gradient Used in the Plan, Illustrating Higher Densities Along Major Routes (Source: Botha, 2015)

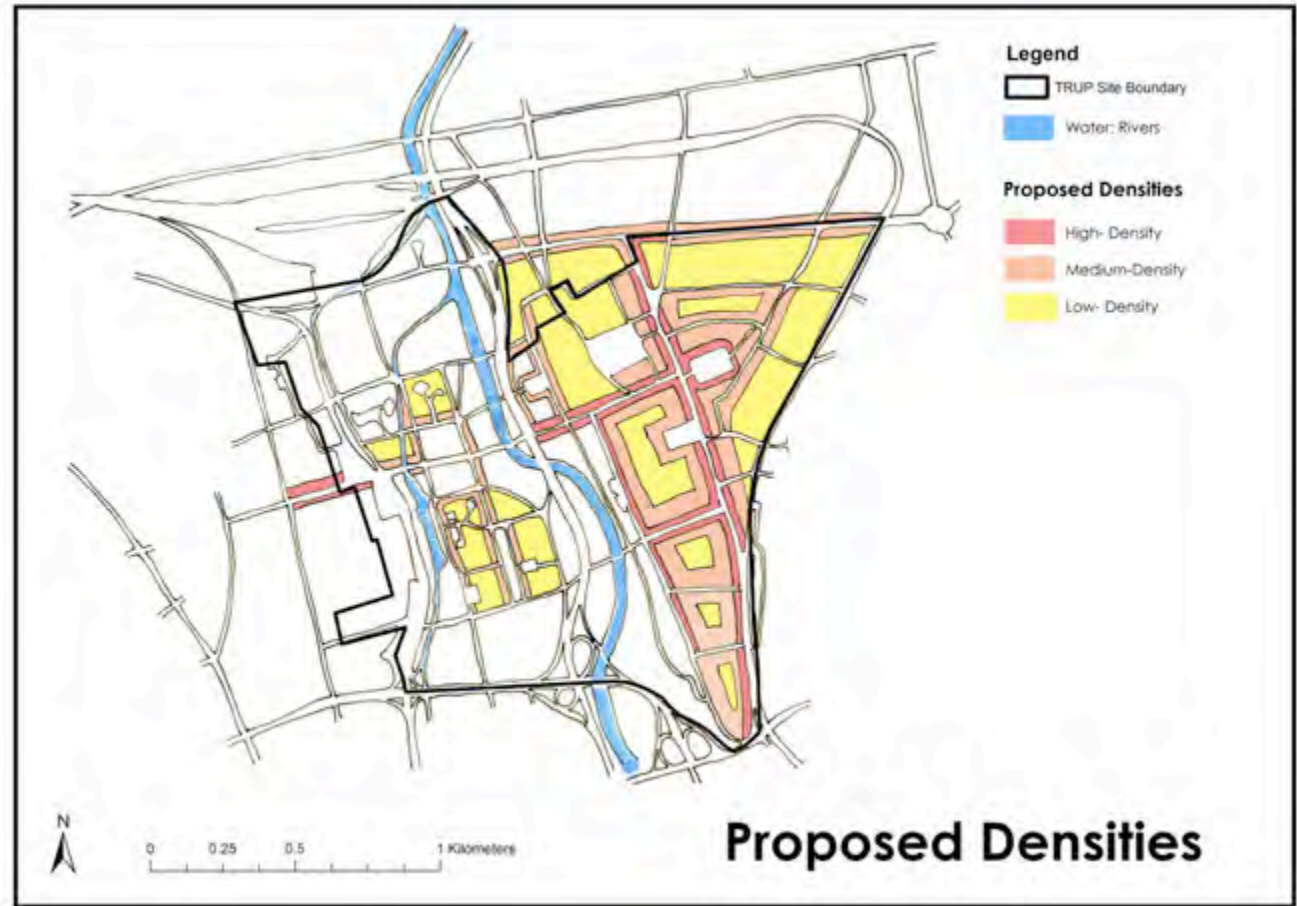


Figure 92: Proposed Densities (Source: Author, 2016)

Proposed Density Guidelines					
Proposed Density	Number of Dwelling Units per Hectare	Maximum Height Restriction	Number of Stories	Land Use Considerations	Percentage of Developable Area
Low Density	30-40	10m	1-2	Predominantly residential development, low-impact housing, eco-tourism, conservation activities	32%
Medium Density	40-50	16m	2-3	Mixed-use, residential, some commercial, institutional (public facilities)	45%
High Density	50-60	28m	3-6	Mixed-use, commercial, residential, institutional	23%

Table 13: Proposed Density Guidelines (Source: Author, 2016)

#### 4.12.7.3 Structuring Elements

The main structuring elements of the proposal are illustrated and annotated in figure 93.

It shows the public realm, including the urban park, movement systems, public spaces, public squares, and other structuring spaces as being the core of the framework, around which development can take place. It also shows a number of well-arranged, proposed special destination places within the site boundary, which should be created as focal points and destinations.

# Two Rivers Urban Park

## Structuring Elements

Timothy Blatch: Studio Project A, 2015

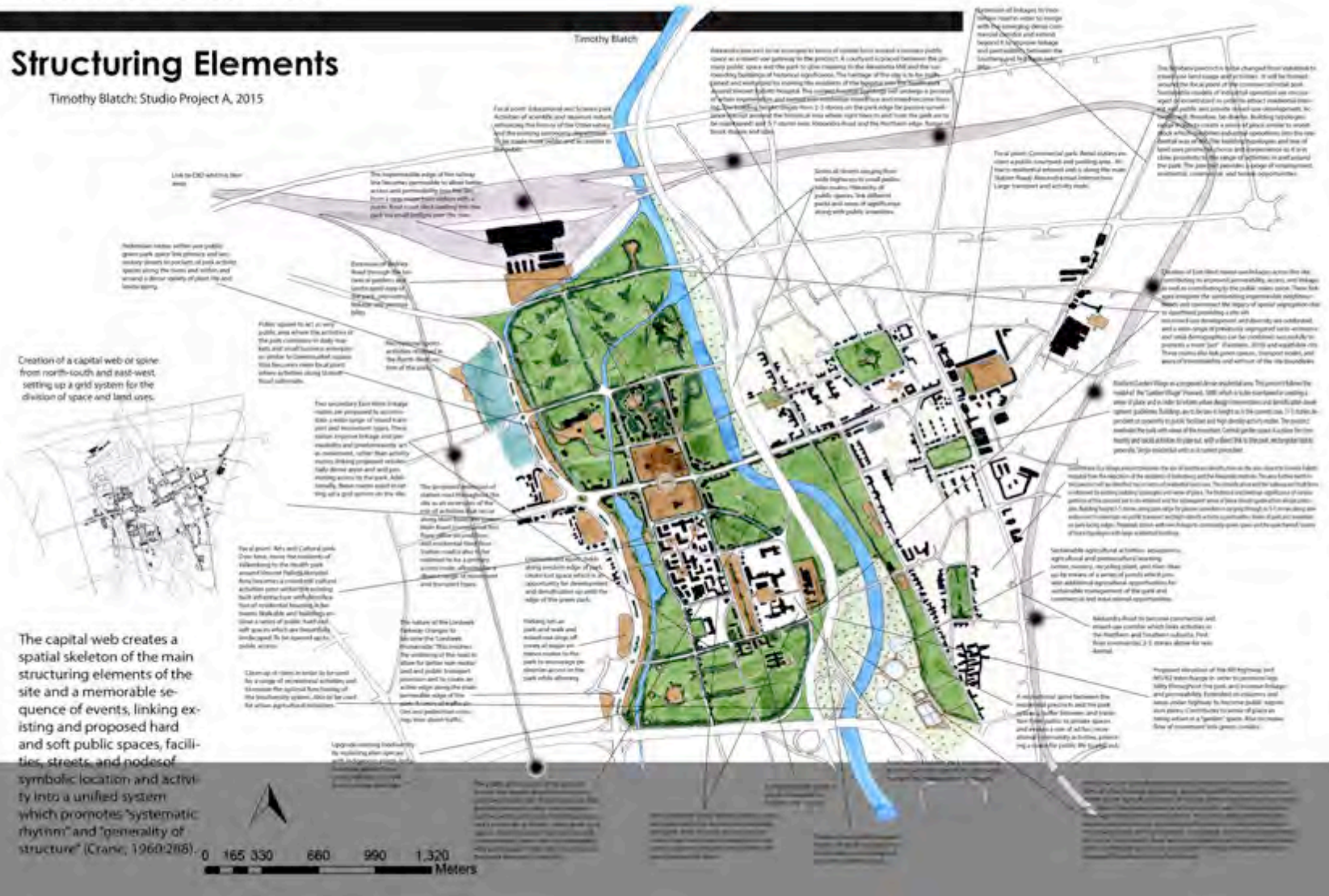


Figure 93: Structuring Elements (Source: Author, 2015)

#### 4.12.7.4 Zoning Considerations

The zoning considerations were previously presented in table 12. This section articulates briefly the set of overlay zones which will be necessary, as strategic implementations, to achieve the implementation of the plan. These overlay zones will be explained in more detail in the following chapter.

#### Overlay Zones

According to the TBSD FEMF (2012), new overlay zones may be required at a local scale, additional to the current zoning enforced by the Development Management Scheme, which replaced the Cape Town Zoning Scheme as part of the City of Cape Town Municipal Planning By-Law, 2015. Overlay zoning imposes either more or less restrictive development rules on a well-established geographical area, for adherence in addition to the base zoning requirements. These overlay zones are to be developed through local area scale planning initiatives, such as this SDF for the TRUP local area site. With careful thought and motivation, based on the contextual analysis of the site and the subsequent spatial development proposals, this SDF will propose overlay zoning as a means to achieve the vision for the site. In this way, conventional zoning is critiqued for its rigidity and its limited ability to enable a mix of land uses. For the successful and efficient

implementation of this SDF, a number of overlay zones are necessary. They are detailed and explained as follows:

#### Special Planning Area Overlay Zone

This zone will be necessary to manage the development of the area outside of formal institutional boundaries and to enable the creation of a series of eco-village-type permaculture communities whose presence on the site will have net-positive gains.



Figure 94: Special Planning Area Overlay Zone (Source: Author, 2016)

## Incentive Overlay Zone

This overlay zone is necessary to create the incentives for green industry and green economic activities and residential activities to locate on the site. This overlay will create provisions for land and tax incentives for net-positive development and zero-waste industrial, business, and residential activities.



Figure 95: Incentive Overlay Zone (Source: Author, 2016)

## Heritage Protection Overlay Zone

This overlay zone is proposed over heritage areas of significance to guide development and heritage resource management and maintain the cultural and heritage sense of place.



Figure 96: Heritage Protection Overlay Zone (Source: Author, 2016)

## Environmental Management Overlay Zone

This overlay will create the provisions for active and passive recreation and conservation of ecological and riverine corridor areas and the urban park buffer. It will enable innovative and participatory environmental management to rehabilitate, restore, enhance, and protect the natural assets on the site without completely separating humans and development from them, making them inaccessible.



Figure 97: Environmental Management Overlay Zone  
(Source: Author, 2016)

## Local Area Overlay Zone

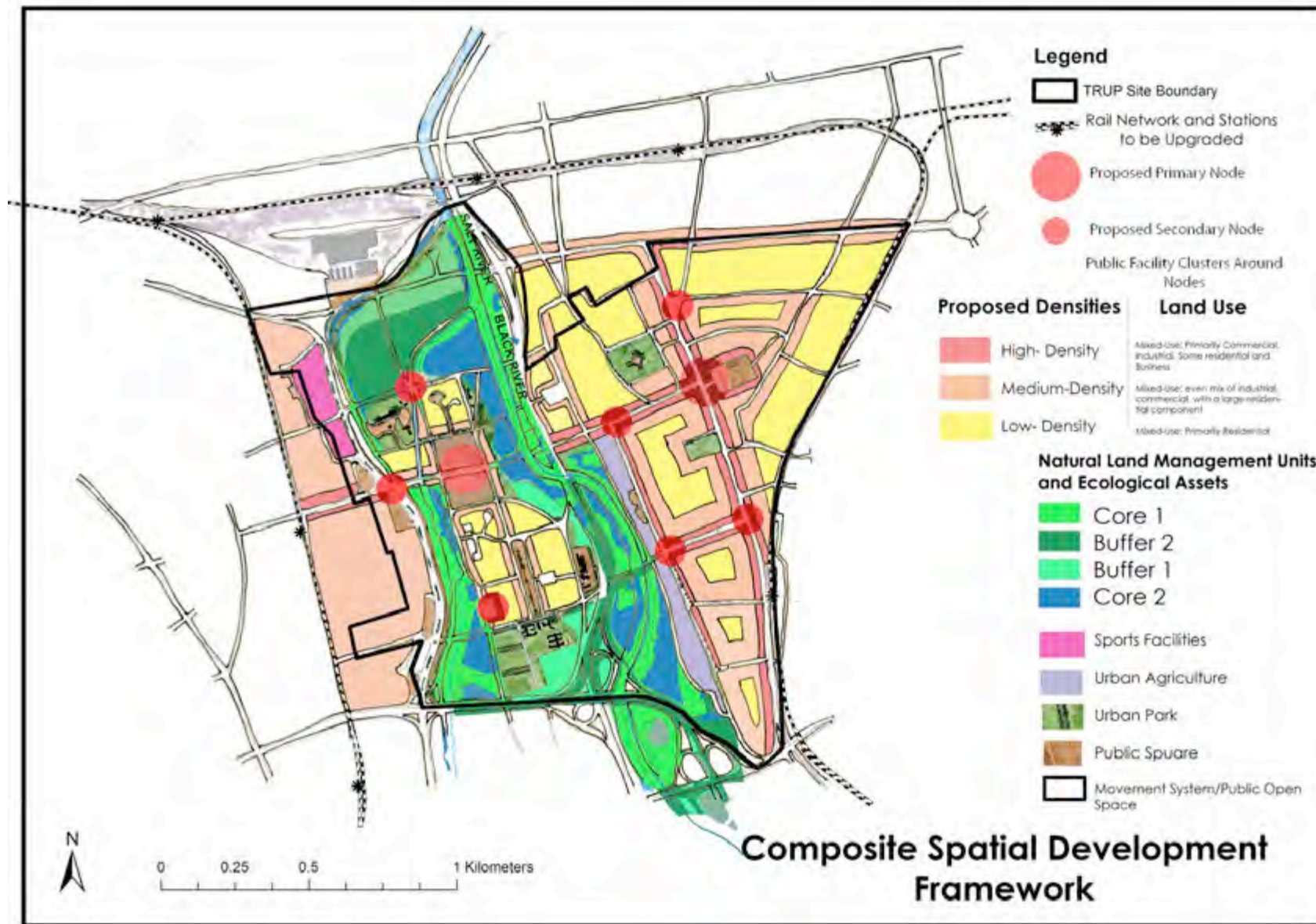
This overlay zone will be established over the entire site to ensure responsible and innovative development. It will create the requirements to allow eco-villages and permaculture intentional communities to thrive on the site and will legitimize their activities within the urban fabric and structure of the CoCT.

## 4.13 Spatial Development Framework

The spatial development framework is shown in figure 98.

It is a combination of the above-mentioned strategies overlaid to produce the overall plan. The plan gives a set of guidelines to achieve the vision for the site by 2036. It seeks to guide development of the area and inform public and private development and investment priorities. The concepts presented earlier in this chapter have been articulated as spatial and non-spatial strategic interventions, which are shown in the composite SDF in figure 98.

Figure 98: Composite Spatial Development Framework (2016-2036) (Source: Author, 2016)



#### 4.14 Conclusion

This chapter has articulated the SDF for the development of the TRUP site over a 20 year period until 2036. Having presented a set of values, principles, a vision, the conceptual development process, and the associated strategic interventions and spatial development framework, this chapter can be concluded. In conclusion, it is evident that the TRUP site, through its development, offers exciting opportunities to experiment with the ways in which we live with nature in cities. There is significant scope, as articulated throughout this chapter, for innovative pilot projects to be tested to enable a learning and research environment towards the practical application of sustainability. It is intended that the framework provides some replicable ideas which can be retrofitted elsewhere in the city and provides a model to exhibit good-practice, net-positive development which has ecological integration at its core and can enable more integrated human-nature relationships. The conservation, rehabilitation, protection, and enhancement of ecological areas is done through the provision of an urban park as a development buffer and amenity for people in the CoCT. It also serves as a green infrastructure component in the MOSS and contributes to the development of a continuous green open space system across the city. The following chapter will present the implementation framework to guide the effective implementation of the framework through a number of

phases, implementation considerations, and key projects, where the roleplayers for each strategic intervention are identified.

## Chapter 5: Implementation

### 5.1 Introduction

Having presented the proposed SDF to guide responsible development and integrate humans and nature on the TRUP site in the previous chapter, this chapter will present the proposed implementation framework or phasing plan for the implementation of the SDF over a twenty year period (2016-2036). This chapter, therefore, is a follow up to the previous chapter (SDF). It will also provide some considerations with regards to the effective implementation of the framework as well as describe some of the key projects and roles of the various stakeholders. Furthermore, it will make recommendations for the implementation of intentional communities and positive development, as well as present a management, monitoring, and evaluation plan and considerations to enable a range of partnerships. This chapter, in essence, describes how the SDF will be enforced and implemented to achieve the vision for the site by 2036.

### 5.2 Development and Implementation Pre-Conditions

Before the implementation of the SDF can begin, there are a number of preconditions and processes, which need to be undertaken. These are described below:

#### LAND CONSOLIDATION

Most of the land within the site is under the ownership of many different entities. Therefore the land ownership needs to be transferred into the hands of a single entity. This will require participatory processes and will make the implementation of the framework more successful.

#### PLAN APPROVAL

Application needs to be submitted to the City of Cape Town to be approved by various legal and policy regulations and legitimized as policy. Some of the applications will include environmental impact assessments (EIA) and land use and zoning applications.

#### DEDICATED TEAM

A dedicated team should be set up to manage the implementation of the framework. The team should be interdisciplinary and include planners, architects, engineers, economists, environmentalists, legal experts and representatives from the local community, private developers and spheres of government.

#### PROVISION OF BASIC INFRASTRUCTURE

The basic infrastructure that needs to be constructed and provided includes roads, water, and stormwater services. These services should be phased in accordance with the

long term roll-out of the planning framework and should be provided before the land is released. (GAPP, Urban Solutions, 2004).

#### LAND RELEASE

Once the land has been consolidated and the basic infrastructure is completed, different sites can be released by the landowner to the market. Small pockets of land should be released to different developers at different times, the sizes determined by the development applications. A document should be prepared that indicates the vision for the area and provide all the technical information that developers should comply with, including urban design guidelines, infrastructure requirements, and intentional community involvement and cooperation considerations (GAPP, Urban Solutions, 2004).

#### CONSTRUCTION

The construction and development of the site can now commence. This development process is guided by the following section, which lays out the implementation framework and related spatial implementation representations.

### 5.3 Implementation Framework

This section contains the implementation framework for the development of the site. This framework is presented through a phased approach, which divides the duration of the framework into three time periods: Short –term (1-7 years (2016-2023)), medium-term (7-14 years (2023-2030)), and long-term (14-20 years (2030-2036)). Acknowledging that the SDF should be strategically implemented to make efficient use of resources and funding, these time periods stagger the development and SDF implementation process in order to establish how each strategic intervention is employed, executed, and realized. It is not intended that all interventions or projects should happen at once, nor is it intended that the duration of each intervention or project be the same. As a result, phasing is necessary in order to establish a coherent and flexible strategy to guide the implementation of the SDF and coordinate different stakeholders and subsequent partnerships. Each phase is presented in a table and then spatially in a map. Each implementation framework table shows each strategic intervention from the SDF in chapter 4 and the specific project guidelines for each intervention, identifies the key stakeholders in each case, gives consideration as to how each intervention and its projects will be funded, and shows the timeframe of each intervention within the scope of each specific phase in terms of when each intervention and its projects is undertaken. The short, medium, and long-

term implementation tables are shown in tables 14, 15, and 16 below. For each table and phase of the implementation, a spatialization of the interventions and projects is presented. These spatial implementation frameworks are shown in figures 99, 100, and 101 and relate directly to the corresponding table for that phase. In each case, the projects and interventions for the phase in question are shown in color, with remaining interventions and projects, belonging to other phases, are shown in black and white. In this way, the progression and realization of the SDF over its twenty year duration is shown (Figure 102).

## Short-Term Implementation Framework: 0-7 Years (2016-2023)

	Strategic Intervention	Specific Project Guidelines	Key Role-Players/Stakeholders	Funding	Timeframe							
					Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	
<b>Strategy 1: Increase Access and Movement Opportunities to Unlock the Site and Erode Barriers to Access</b>	Facilitate Improved Access	Establish a grid of accessibility to facilitate a mixture of transport modes and opportunities, create east-west linkages through the site to connect and integrate the surrounding neighborhoods and increase permeability and access: extensions to Station Road, Berkeley Road, and the construction of two east-west linkage routes between Berkeley and Station Road and Station Road and the N2, the creation of a "Park Road" along the eastern edge of the park, the construction of road linkages over the railway line into Pinelands, and the extension of north-south movement routes to link the site to the proposed development of the Voortrekker corridor, again building bridges over the railway. Streets to be constructed with permeable surfaces to decrease runoff as far as possible: consider using bricks and permeable building materials, made on site	Department of Transport, The South African National Roads Agency SOG Limited (SANRAL), Department of Transport and Public Works, Western Cape Government (WCG), Traffic Services Department (CoCT)	Tax revenue distributed through appropriations from national and provincial government								
	Enable Corridor Development	Begin to increase densities along Alexander Road, the new "Park Road" and the proposed extension of Station Road to make public transport viable along these routes	Civil Society (CS), Private Developers (PD), CoCT, Planning and Building Development Management Department	Civil Society (CS), Private Developers (PD), CoCT								
	Promote Development Intensification	Develop specific nodal functions for proposed nodes, in line with the functions of the streets where they are positioned	CoCT, Planning and Building Development Management Department and the Spatial Planning and Urban Design Department (SPUD)	Civil Society (CS), Private Developers (PD), CoCT, Planning and Building Development Management Department								
	Upgrade and harness the potential of the Rail Network and Its Stations	Enhance the quality of rail as a viable and affordable transport option to connect the site to the rest of the city and increase access, upgrade trains, ensure a mix between freight and commuter rail options, based on demand	National Department of Transport, Department of Transport and Public Works (WCG), Transport for Cape Town Directorate (CoCT)	National Department of Transport through national grants, Department of Transport and Public Works (WCG), Transport for Cape Town Directorate (CoCT)								
	Make existing boundaries permeable: Building Bridges	Upgrade existing bridges and make them safe and pedestrian-friendly	Traffic Services Department (CoCT), Department of Transport and Public Works (WCG)	Traffic Services Department (CoCT), Department of Transport and Public Works (WCG)								
	Provide and Facilitate Access to public facilities and opportunities by improving the efficiency of public transport systems	Make social and institutional facilities accessible through the provision of public transport	Traffic Services Department (CoCT), Department of Transport and Public Works (WCG)	CoCT								
	Cluster the provision of Public Facilities at nodal points which are easily accessible	Designate land for public and institutional facilities at nodal points	SPUD (CoCT)	CoCT								
<b>Strategy 2: Keep Assets Intact: Protect Valuable Natural Resources/Ecological River Corridors</b>	Manage Natural Assets: Restore, Protect, and Enhance	Natural Management Unit Guidelines, develop a disaster risk management strategy, specifically for potential flooding, flood modelling	Development Information and GIS Department, Environmental Resource Management Department (ERM), Integrated Risk Management Department (CoCT), Department of Environmental Affairs and Development Planning (WCG)	CoCT, WCG								
	Retain and Develop Continuous Open Space Corridors as Green Infrastructure Linkages	Formalization of the urban park and conservation areas as being part of the MOSS, prevent development in certain areas	SPUD (CoCT), Department of Environmental Affairs and Development Planning (EADP) (WCG)	CoCT, WCG								
	Restore and Rehabilitate Natural Resources to their Natural State	Create Natural Management Units for specific management approaches, restore and rehabilitate natural assets by managing stormwater pollution of rivers, preventing pollution through immediate removal of pollutants and organic farming practices, decolonization of the Liesbeek river, removal of alien plant species, restore the rivers to their natural state as far as possible by formulating a river management policy for the Black and Liesbeek Rivers	ERM Department, Water and Sanitation Department, Solid Waste Management Department, SPUD (CoCT), EADP (WCG), South African National Biodiversity Institute (SANBI), South African National Parks (SANParks), Friends of the Liesbeek and Black River Organizations, CS, PD, Industry Owners	ERM Department, Water and Sanitation Department, Solid Waste Management Department, SPUD (CoCT), EADP (WCG), SANBI, SANParks, Friends of the Liesbeek and Black River Organizations, CS, PD, Industry Owners								
	Protect the Natural Assets and Ecological Corridor											
	Enhance the Quality and Vibrance of the Natural Public Open Space System											
	Manage Heritage and Cultural Assets	Identify heritage resources, retain buildings and areas of cultural and heritage significance, honor the heritage of the area through a memorialization of zero-impact Khoi-San ways of living at the former river crossing place	South African Heritage Resources Agency (SAHRA), Provincial Heritage Resources Authority (PHRA), Department of Cultural Affairs and Sport (WCG), Arts and Culture Department (CoCT)	SAHRA, PHRA								

Table 14: Short-Term Implementation Framework (Source: Author, 2016)

<b>Strategy 3: Manage Urban Growth Sustainably By Enabling a Balance Between Urban Development (Humans) and the Natural Environment (Nature)</b>	Enable permeable and integrated Urban- Ecological interfaces	Promote densification on edges which face the park to provide passive surveillance and frame open space	SPUD (CoCT), EADP (WCG), CS, PD	SPUD (CoCT), EADP (WCG), CS, PD																
	Identify Areas Suitable for Future Urban Growth	Identify lost space, identify areas with no formal conservation status for future development	SPUD (CoCT)	SPUD (CoCT)																
	Promote and Enable Infill Development, Densification, and Land Use Intensification	Develop sites suitable for infill development	CS, PD, CoCT, WCG	CS, PD, CoCT, WCG																
	Expand Housing Opportunities	Develop residential housing with a range of ownership and tenure types in areas suitable for development	PD, Private Land Owners (PLO), CS, Department of Human Settlements, Department of Social Development (WCG)	PLO, PD, WCG																
	Create Urban Development Edges	Create an urban development edge to contain development and prevent it from sprawling into areas of natural or biodiversity significance	SPUD (CoCT), EADP (WCG)	SPUD (CoCT)																
	Implement Urban Development Guidelines	Adhere to urban development guidelines of the TBSDFEMF	TRUP Management Committee	PLO, CS, PD, CoCT, WCG																
	Urban Development Considerations	Design for and with nature	All Parties Involved	All Stakeholders																
<b>Strategy 4: Ensure Adequate Provision of High-Quality Public Green Open Spaces and Integrate these with the Proposed Development</b>	Create a Clear Hierarchy Of Public Spaces	Identify areas best suited to public space provision in terms of where people will move around the site	SPUD (CoCT)	CoCT																
	Create a Healthy Natural Environment as an Urban Park	Planting of indigenous flora to enhance the green open space environment, formalization of the space as an urban park	Landscape Architects, Sports and Recreation Department, City Parks Department (CoCT),	Private sector, CoCT																
<b>Strategy 5: Create a Green Neighborhood</b>	Transition to Zero Waste	Provision of recycling facilities, creation of guidelines to limit the amount of waste brought on/allowed on the site, repurposing of items which are seen as waste	CoCT	CoCT																
	Promote Green and Ecologically-Sensitive	Zero expansion of the city's infrastructure grids, harvesting of stormwater for other uses	PD, CS, PLO, CoCT, WCG	PD, CS, PLO, CoCT, WCG																
	Take Proposed Development Off-Grid: Use of Renewable Energy	Strict development guidelines and application approvals based on their ability to be self-sufficient and provide their own energy	Electricity Department, Executive Services Department, Solid Waste Department, Water and Sanitation Department (CoCT), TRUP Management Committee, PLO, PD, CS	PD, PLO, CoCT, WCG																
	Mandate Positive Development with Zero-Positive Environmental Impact	Through overlay zoning, enforce provisions for positive development, with zero negative environmental impact. In order for applications to be approved, they should be able to prove that they will enhance the natural environment and contribute positively to its enhancement eg green roofs to ensure no loss of ground space	SPUD (CoCT), EADP (WCG)	SPUD (CoCT), EADP (WCG)																
	Encourage Food Production	Create spaces for community gardens and intensive organic agriculture areas, assess development applications on the basis of their ability to provide a certain amount of food for communal benefit	SPUD (CoCT), TRUP Management Committee, EADP (WCG), PLO, PD, CS	WCG, CoCT, PLO, PD, CS																
<b>Strategy 6: Build an innovative, integrated, vibrant, inclusive, and sustainable eco-community as a Place of Learning</b>	Ensure a Social Mix of People	Form land ownership committees and make the provisions for subsidized housing, make investment in low-income housing mandatory for any development application	TRUP Land Owners Association, Department of Human settlements (WCG), PLO, PD, CS	PLO, CoCT, WCG, PD																
	Build an Inclusive, Sustainable, Diverse Local Economy	Create a Local Economic Development strategy to guide and manage job creation, provide spaces for the informal economy	Economic Development Department (CoCT), Department of Economic development and Tourism (WCG), TRUP Management Committee (TMC)	CoCT, WCG, TMC																
	Support and Promote Skill Development	Remove red-tape barriers to upward mobility through profit-sharing initiatives	Employment Equity Department, Economic Development Department, Trade and Investment Department (CoCT), Department of Economic Development and Tourism (WCG), CS, The Urban Poor	CoCT, WCG																
	Allow the Informal Economy to Thrive	Provide the necessary infrastructure for informal markets which attract people and tourism	New Market department, Employment Equity Department, Economic Development Department (CoCT), TMC, Informal Economy Vendors	CoCT																
	Provide Support for Small-Medium Entrepreneurial Enterprises	Give loans to start-ups and sustainable business plans on a small scale	New Market department, Employment Equity Department, Economic Development Department (CoCT), TMC, Informal Economy Vendors, Small-Medium Business Owners	CoCT, TMC																
	Create and Build a Series of Intentional Communities	Land subdivisions to allow for communities of different types and sizes to locate to the site, develop the requirements for sustainable communities, provide an eco-community center which provides support for intentional communities and attempts to build cohesion between them	SPUD (CoCT), EADP, Department of Social Development (WCG), CS, PLO, PD	CoCT, WCG																
	Enable the Promotion of Permaculture	Set limits to consumption and reproduction and redistribute surplus	TMC, CS, PLO, PD	TMC, CS, Future Residents																
	Promote Innovative Project Testing: Bottom Up-Cooperation	Develop research on potential pilot projects which demonstrate world-class and good-practice projects which are replicable	Tertiary Education Institutions (UCT, CPU), Stellenbosch University, UWG, PD, TMC Research and Development Unit	NFS, NASFAS, TMC through grants from CoCT and the WCG																
<b>Strategy 7: Enable a Strategic Mix of Land Uses to Facilitate Positive Development</b>	Land Use	Develop commercial and institutional uses, as well as enhance public space, plant flora and greenery/trees/food	SPUD (CoCT), EADP (WCG)	CoCT, WCG																
	Increase Densities	Along corridors	CoCT, WCG, PLO, CS, PD	CoCT, WCG, PLO, CS, PD																
	Structuring Elements	Locate a series of destination places which are logically placed	All Stakeholders	Individual Land Owners																
Zoning Considerations	Create and develop overlay zone guidelines, new zoning to allow for mixed-use and residential uses, as well as commercial and industrial uses (around green industry innovative initiatives with no emissions so that they can be places in areas with other uses)	SPUD (CoCT), EADP (WCG)	CoCT, WCG																	

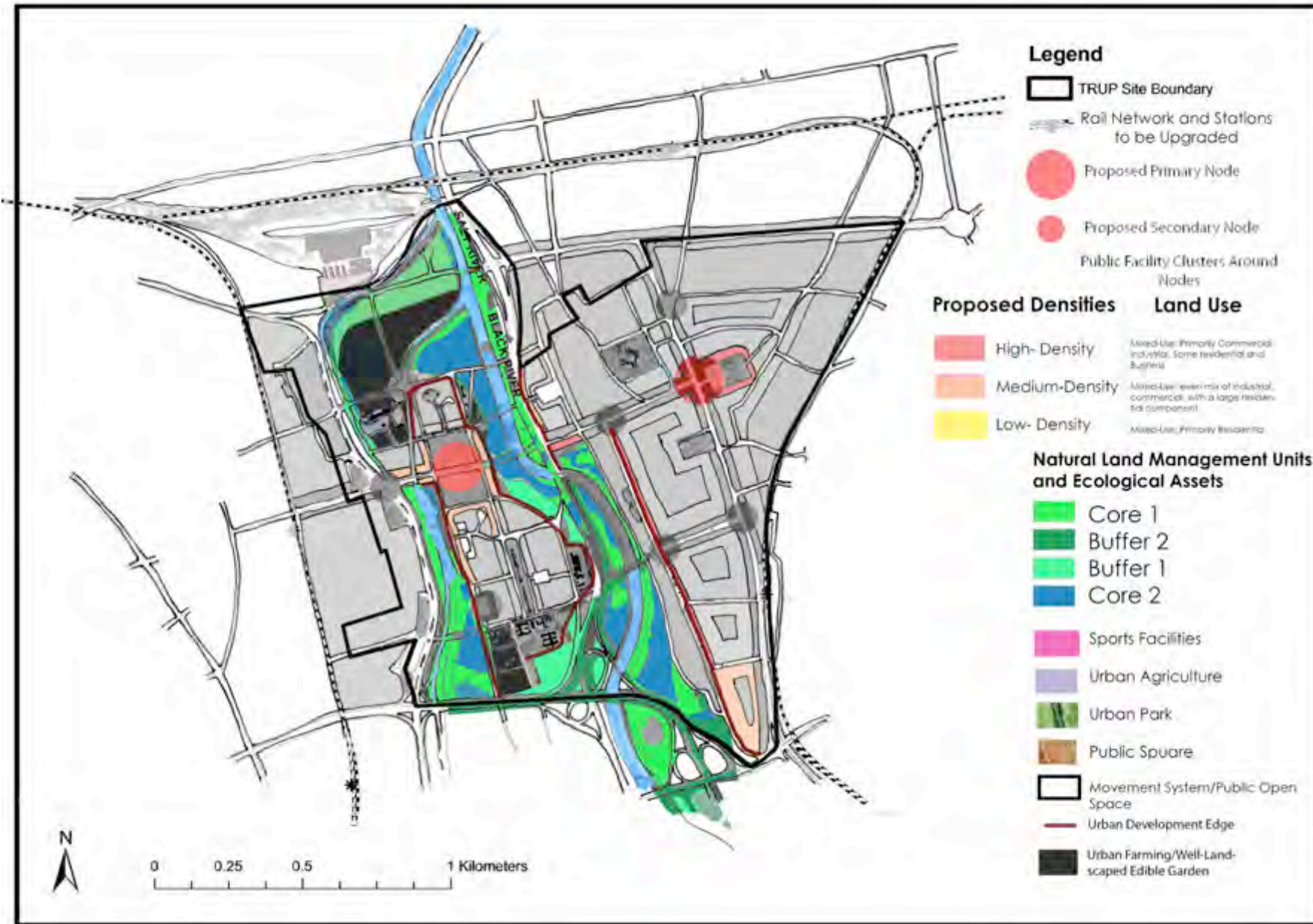


Table 15:

Figure 99: Short-Term Spatial Implementation Framework (Source: Author, 2016)

Medium-Term Implementation Framework (Source: Author, 2016)

Medium-Term Implementation Framework: 7-14 Years (2023-2030)												
	Strategic Intervention	Specific Project Guidelines	Key Role-Players/Stakeholders	Funding	Timeframe							
					Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	
<b>Strategy 1: Increase Access and Movement Opportunities to Unlock the Site and Erode Barriers to Access</b>	Facilitate Improved Access	Upgrade, improve, and develop precinct-scale street networks (primarily for pedestrians, public transport, and NMT), develop a network of pedestrian walkways through the park and through the precincts to provide for NMT and active, renewable, healthy movement, such as walking	Department of Transport, The South African National Roads Agency SOG Limited (SANRAL), Department of Transport and Public Works, Western Cape Government (WCG), Traffic Services Department (CoCT), PD, PLO	Funded by individual developers and private land owners, with support from the city and province								
	Enable Corridor Development	Rail out public transport along corridor routes, assess the viability of the Mycity bus network along Alexander and Station Roads	National Department of Transport, Department of Transport and Public Works (WCG), Transport for Cape Town Directorate (CoCT)	Civil Society (CS), Private Developers (PD), CoCT								
	Promote Development Intensification	Promote high-density, mixed-use development around strategic nodes	CoCT: Planning and Building Development Management Department and the Spatial Planning and Urban Design Department (SPUD), EADP (WCG)	Civil Society (CS), Private Developers (PD), CoCT: Planning and Building Development Management Department								
	Upgrade and harness the potential of the Rail Network and its Stations	Upgrade stations along the rail route which surrounds the site, to ensure they become multi-modal transport interchanges	National Department of Transport, Department of Transport and Public Works (WCG), Transport for Cape Town Directorate (CoCT)	National Department of Transport through national grants, Department of Transport and Public Works (WCG), Transport for Cape Town Directorate (CoCT)								
	Make existing boundaries permeable: Building Bridges	Build new bridges to facilitate access and permeability	Traffic Services Department (CoCT), Department of Transport and Public Works (WCG)	Traffic Services Department (CoCT), Department of Transport and Public Works (WCG)								
	Provide and Facilitate Access to public facilities and opportunities by improving the efficiency of public transport systems	Provide public facilities around green development and in line with the facilities required by 2036, as designated by the social facilities threshold table (chapter 4)	Traffic Services Department (CoCT), Department of Transport and Public Works (WCG)	CoCT								
	Cluster the provision of Public Facilities at nodal points which are easily accessible	Create a primary cluster of social facilities at the intersection of Station and Alexander Roads. The provision of these services and institutions should exhibit good-practice green building as an example for other development to replicate	SPUD (CoCT)	CoCT								
<b>Strategy 2: Keep Assets Intact: Protect Valuable Natural Resources/Ecological River Corridors</b>	Manage Natural Assets: Restore, Protect, and Enhance	Natural Management Units Guidelines (Chapter 4)	Development Information and GIS Department, Environmental Resource Management Department (ERM), Integrated Risk Management Department (CoCT), Department of Environmental Affairs and Development Planning (WCG)	CoCT, WCG								
	Retain and Develop Continuous Open Space Corridors as Green Infrastructure Linkages											
	Restore and Rehabilitate Natural Resources to their Natural State											
	Protect the Natural Assets and Ecological Corridor	Protect natural assets through the development and enforcement of a development edge to ensure compaction and a lack of sprawl into natural areas, educational initiatives to protect the rivers and biodiversity from pollutants and threats, development of the multi-tiered buffer system, identification of areas suitable to development based on promoting zero-environmental impact and informed by the presence of natural assets	SPUD (CoCT), EADP (WCG), schools and Tertiary Institutions, Department of Water and Sanitation, Friends of the Liesbeek and Black Rivers Organizations, SANBI	SPUD (CoCT), EADP (WCG), schools and Tertiary Institutions, Department of Water and Sanitation, Friends of the Liesbeek and Black Rivers Organizations, SANBI								
	Enhance the Quality and Vibrance of the Natural Public Open Space System											
Manage Heritage and Cultural Assets	Develop precinct plans for each precinct to establish strong urban design frameworks for the sustainable and zero-impact development of each precinct. This process should decide the character of different movement routes and will provide closer-scale guidelines for positive development and innovative ways to connect humans and nature through creative projects. The repurposing of abandoned and other heritage buildings and areas for sustainable development, the movement of the Valkenberg hospital into the Alexandra Precinct near to the Alexandra Hospital	South African Heritage Resources Agency (SAHRA), Provincial Heritage Resources Authority (PHRA), Department of Cultural Affairs and Sport (WCG), Arts and Culture Department (CoCT)	SAHRA, PHRA									

<b>Strategy 3: Manage Urban Growth Sustainably By Enabling a Balance Between Urban Development (Humans) and the Natural Environment (Nature)</b>	Enable permeable and integrated Urban-Ecological interfaces																			
	Identify Areas Suitable for Future Urban Growth																			
	Promote and Enable Infill Development, Densification, and Land Use Intensification	Densify development in areas suitable to urban development, eg in Observatory to border and frame the park with development which faces onto the Liesbeek Parkway	CS, PD, CoCT, WCG	CS, PD, CoCT, WCG																
	Expand Housing Opportunities	Develop residential housing with a range of ownership and tenure types in areas suitable for development	PD, Private Land Owners (PLO), CS, Department of Human Settlements, Department of Social Development (WCG), NGOs	PLO, PD, WCG, NGOs																
	Create Urban Development Edges	Enforce the urban development edge, legitimize this edge in the CTSDP	SPUD (CoCT), EADP (WCG)	SPUD (CoCT)																
	Implement Urban Development Guidelines	Adhere to urban development guidelines of the TBSDFEMF	TRUP Management Committee	PLO, CS, PD, CoCT, WCG																
	Urban Development Considerations	Implement minimum requirements in terms of the presence of ecological and natural areas integrated with urban development	All Parties Involved	All Stakeholders																
Urban Design Considerations and Principles	Assess development applications based on their adherence with urban design guidelines	SPUD (CoCT), EADP (WCG)	CoCT, WCG																	
<b>Strategy 4: Ensure Adequate Provision of High-Quality Public Green Open Spaces and Integrate these with the Proposed Development</b>	Create a Clear Hierarchy Of Public Spaces	Develop an urban park, permeable public squares, sports and recreation facilities, and green open spaces	SPUD (CoCT)	CoCT																
	Create a Healthy Natural Environment as an Urban Park	Allow for, provide, and promote zero-impact recreational facilities to attract people to the park, provide adequate lighting, provide pathways and multi-modal NMT movement routes through the park to increase its legibility and lead people to destination places	Landscape Architects, Sports and Recreation Department, City Parks Department (CoCT),	Private sector, CoCT																
<b>Strategy 5: Create a Green Neighborhood</b>	Transition to Zero Waste	Enforce guidelines around alternative packaging, removal of the use of plastic	CoCT	CoCT																
	Promote Green and Ecologically-Sensitive Infrastructure	Assess development applications on the basis of their ability to become off-grid and use alternative and innovative ways to provide required infrastructure	PD, CS, PLO, CoCT, WCG	PD, CS, PLO, CoCT, WCG																
	Take Proposed Development Off-Grid: Use of Renewable Energy	Develop solar and wind energy projects to sell energy back to the grid as surplus and retain local benefit.	Electricity Department, Executive Services Department, Solid Waste Department, Water and Sanitation Department (CoCT), TRUP Management Committee, PLO, PD, CS	PD, PLO, CoCT, WCG																
	Mandate Positive Development with Zero-Positive Environmental Impact	Improve the quality and presence of nature through strategic planting, gardening, and landscaping	SPUD (CoCT), EADP (WCG)	SPUD (CoCT), EADP (WCG)																
	Encourage Food Production	Intensive food gardening through vertical gardens, green roofs, and along streets	SPUD (CoCT), TRUP Management Committee, EADP (WCG), PLO, PD, CS	WCG, CoCT, PLO, PD, CS																

Strategy 6: Build an innovative, integrated, vibrant, inclusive, and sustainable eco-community as a Place of Learning	Ensure a Social Mix of People	Provide social and low-cost housing options	TRUP Land Owners Association, Planning and Building Development Management Department (CoCT), Department of Human settlements (WCG), PLO, PD, CS	PLO, CoCT, WCG, PD																	
	Build an Inclusive, Sustainable, Diverse Local Economy	Provide development along major routes to provide facilities for SMME business activity, removal of red tape for loans and financing for small businesses, provide skills development through community learning and a skills development center to teach skills around conservation, craftmanships, the creative economy, artisan products, and agriculture	Economic Development Department (CoCT), Department of Economic development and Tourism (WCG), TRUP Management Committee (TMC)	CoCT, WCG, TMC																	
	Support and Promote Skill Development	Involve tertiary education facilities, such as UCT, in learning, research, and development projects in skills development projects	Employment Equity Department, Economic Development Department, Trade and Investment Department (CoCT), Department of Economic Development and Tourism (WCG), CS, The Urban Poor, Tertiary Institutions in the Cape Town region	NSFAS, NRF																	
	Allow the Informal Economy to Thrive	Legitimize the informal economy and its markets as providing employment opportunities	New Market department, Employment Equity Department, Economic Development Department (CoCT), TMC, Informal Economy Vendors	CoCT																	
	Provide Support for Small-Medium Entrepreneurial Enterprises	Legitimize small businesses and encourage investment and involvement of the local community and surrounding neighborhoods	New Market department, Employment Equity Department, Economic Development Department (CoCT), TMC, Informal Economy Vendors, Small-Medium Business Owners	CoCT, TMC																	
	Create and Build a Series of Intentional Communities	Tax incentives and land subsidies for community-building models which provide replicable ideas around positive development	SPUD (CoCT), EADP, Department of Social Development (WCG), CS, PLO, PD	CoCT, WCG																	
	Enable the Promotion of Permaculture	Form intentional communities through civil society interest and learning workshops to educate about permaculture	TMC, CS, PLO, PD	TMC, CS, Future Residents																	
	Promote Innovative Project Testing: Bottom Up-Cooperation	Remove red tape barriers and create the preconditions for the pilot project implementations, prepare frameworks and site plans	Tertiary Education Institutions (UCT, CPUJ, Stellenbosch University, UWC), PD, TMC Research and Development Unit	NFS, NSFAS, TMC through grants from CoCT and the WCG																	
Strategy 7: Enable a Strategic Mix of Land Uses to Facilitate Positive Development	Land Use	Develop mixed-use land uses	SPUD (CoCT), EADP (WCG)	CoCT, WCG																	
	Increase Densities	Along activity routes	CoCT, WCG, PLO, CS, PD	CoCT, WCG, PLO, CS, PD																	
	Structuring Elements	Link destination and special places through movement routes and pedestrian walkways	SPUD (CoCT), EADP (WCG), TMC	Individual Land Owners																	
	Zoning Considerations	Implement overlay zones	SPUD (CoCT), EADP (WCG)	CoCT, WCG																	

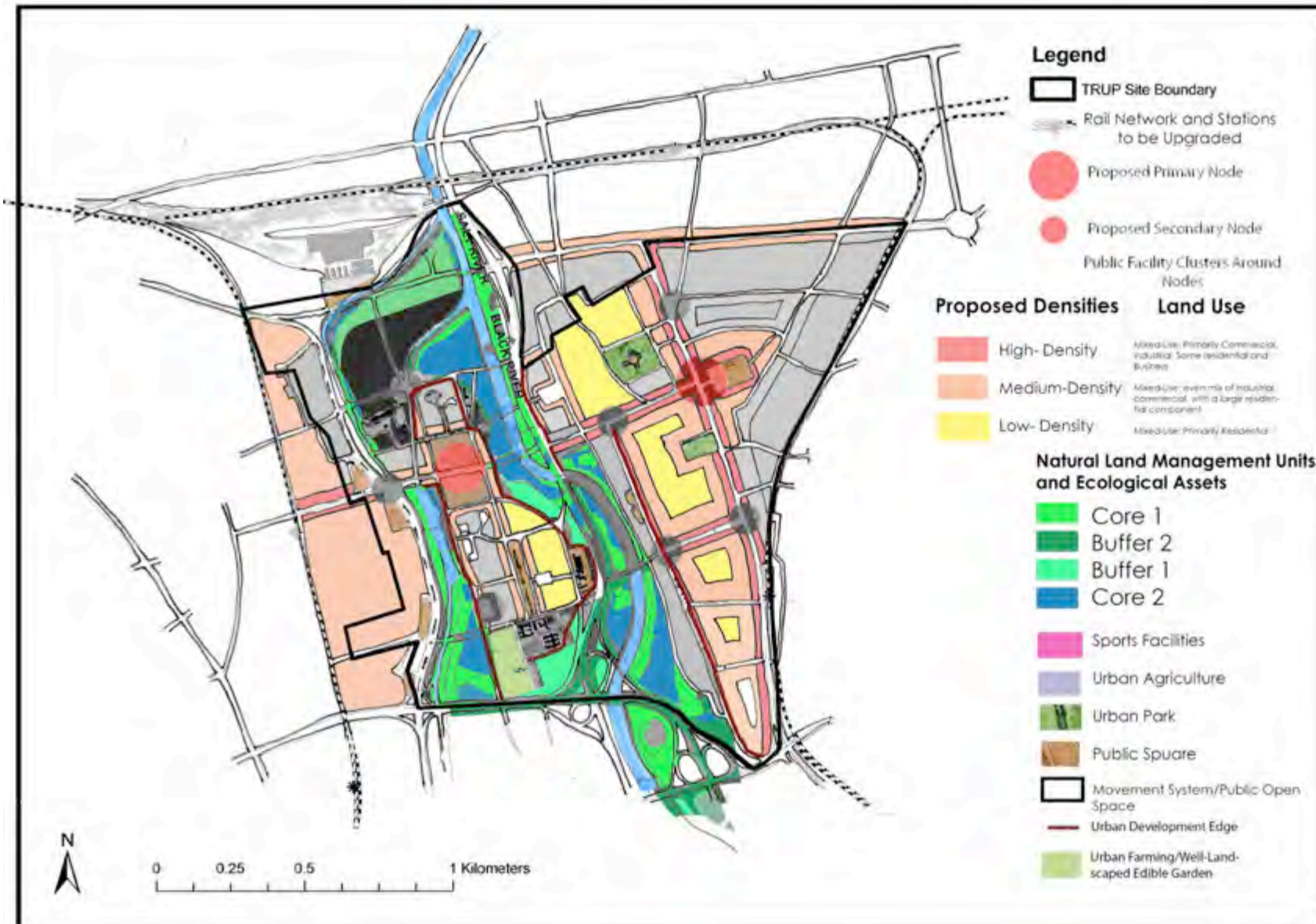


Figure 100: Medium-Term Spatial Implementation Framework (Source: Author, 2016)

## Long-Term Implementation Framework: 14-20 Years (2030-2036)

	Strategic Intervention	Specific Project Guidelines	Key Role-Players/Stakeholders	Funding	Timeframe							
					Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	
<b>Strategy 1: Increase Access and Movement Opportunities to Unlock the Site and Erode Barriers to Access</b>	Facilitate Improved Access	Maintain the quality of the street network, continuously striving to enhance the pedestrian experience, ensure the provision of nature and greenery along all transport routes	Department of Transport, The South African National Roads Agency SOC Limited (SANRAL), Department of Transport and Public Works, Western Cape Government (WCG), Traffic Services Department (CoCT)	Tax revenue distributed through appropriations from national and provincial government								
	Enable Corridor Development	Concentrate economic and other activity along routes designated as corridors, carefully ensure an efficient mix of uses, using incentives for "green" economic and industrial development	Civil Society (CS), Private Developers (PD), CoCT, Planning and Building Development Management Department	Civil Society (CS), Private Developers (PD), CoCT								
	Promote Development Intensification	Increase development through incentives along movement routes to support nodes	CoCT, Planning and Building Development Management Department and the Spatial Planning and Urban Design Department (SPUD)	Civil Society (CS), Private Developers (PD), CoCT, Planning and Building Development Management Department								
	Upgrade and harness the potential of the Rail Network and its Stations	Cluster mixed use and institutional activities around rail stations and increase densities around these stations	National Department of Transport, Department of Transport and Public Works (WCG), Transport for Cape Town Directorate (CoCT), Executive Services Department (CoCT)	National Department of Transport through national grants, Department of Transport and Public Works (WCG), Transport for Cape Town Directorate (CoCT)								
	Make existing boundaries permeable: Building Bridges											
	Provide and Facilitate Access to public facilities and opportunities by improving the efficiency of public transport systems											
<b>Strategy 2: Keep Assets Intact: Protect Valuable Natural Resources/Ecological River Corridors</b>	Cluster the provision of Public Facilities at nodal points which are easily accessible	Create secondary and tertiary public facility clusters around public squares and spaces, strengthen linkages between these facilities and between different cluster hierarchies, enhance sports facilities	SPUD (CoCT)	CoCT								
	Manage Natural Assets: Restore, Protect, and Enhance											
	Retain and Develop Continuous Open Space Corridors as Green Infrastructure Linkages											
	Restore and Rehabilitate Natural Resources to their Natural State											
	Protect the Natural Assets and Ecological Corridor											
	Enhance the Quality and Vibrance of the Natural Public Open Space System	Enhance the natural areas on the site through the upgrading of public space, the creation of an overlay zone which seeks to ensure conservation through interaction with people, development of creative projects to upgrade open space areas, planting of trees, food, and indigenous plants to create a vibrant natural environment, provide access routes through conservation areas which are constructed with zero-environmental impact	SPUD (CoCT), EADP (WCG), schools and Tertiary Institutions, Department of Water and Sanitation, Friends of the Liesbeek and Black Rivers Organizations, SANBI	SPUD (CoCT), EADP (WCG), schools and Tertiary Institutions, Department of Water and Sanitation, Friends of the Liesbeek and Black Rivers Organizations, SANBI, SANParks, CS, PD, PLO								
Manage Heritage and Cultural Assets	Continuous protection, enhancement, and management of cultural and heritage resources and assets	South African Heritage Resources Agency (SAHRA), Provincial Heritage Resources Authority (PHRA), Department of Cultural Affairs and Sport (WCG), Arts and Culture Department (CoCT)	SAHRA, PHRA									
<b>Strategy 3: Manage Urban Growth Sustainably By Enabling a Balance Between Urban Development (Humans) and the Natural Environment (Nature)</b>	Enable permeable and integrated Urban-Ecological Interfaces											
	Identify Areas Suitable for Future Urban Growth											
	Promote and Enable Infill Development, Densification, and Land Use Intensification	Intensify land uses and enable a mix of uses, for example commercial on the bottom floor, business on the second, and residential on the remaining floors	CS, PD, CoCT, WCG	CS, PD, CoCT, WCG								
	Expand Housing Opportunities	Develop residential housing with a range of ownership and tenure types in areas suitable for development	PD, Private Land Owners (PLO), CS, Department of Human Settlements, Department of Social Development (WCG)	PLO, PD, WCG								
	Create Urban Development Edges	Consider positive development projects, based on applications, beyond the urban edge to exhibit good-practice and refrain from separating development and nature completely	SPUD (CoCT), EADP (WCG)	SPUD (CoCT)								
	Implement Urban Development Guidelines	Adhere to urban development guidelines of the TBSPDPEMF	TRUP Management Committee	PLO, CS, PD, CoCT, WCG								
	Urban Development Considerations	Planting of rich natural vegetation in urban areas, landscaping as an integral part of any new development	All Parties Involved	All Stakeholders								
Urban Design Considerations and Principles												



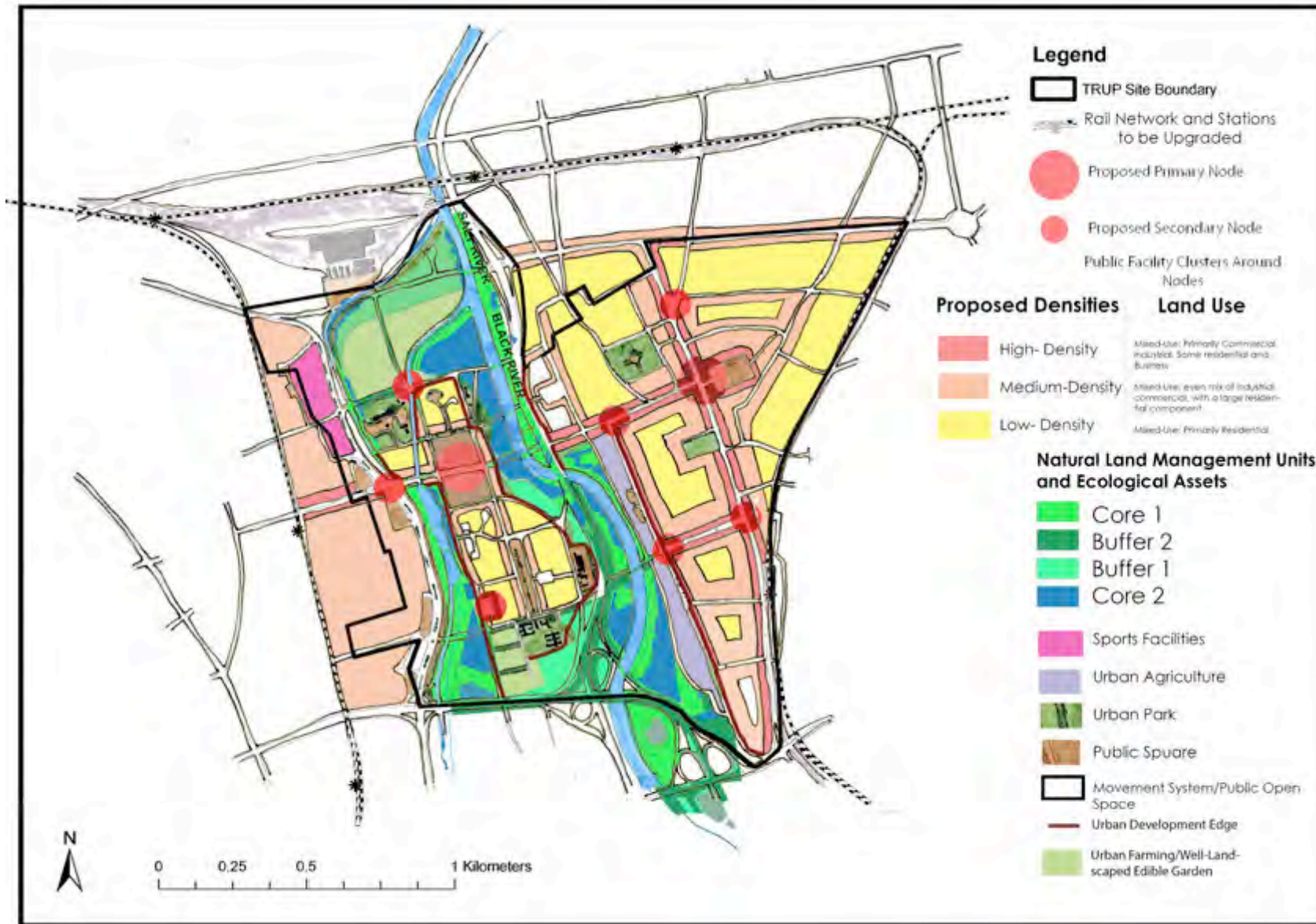


Figure 101: Long-Term Spatial Implementation Framework (Source: Author, 2016)

Phase 1: Short Term

Phase 2: Medium Term

Phase 3: Long Term

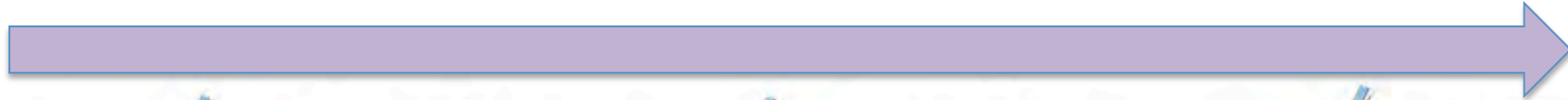


Figure 102: Phasing Progression over 20 Years (Source: Author, 2016)

## 5.4 Key Projects

A number of key projects, which span economic, social, settlement, and environmental boundaries and require the integration of various frameworks to effectively have positive knock-on effects for the site are highlighted below. These projects are seen as key to the successful and efficient implementation of the SDF for the TRUP site. It is important to note that this section is not an exhaustive explanation of all projects for the twenty year lifespan of this SDF. Instead, it is an articulation of a few key priority projects to be implemented in the short-term to unlock the region's potential and stimulate growth and development. The projects which are not exhaustively explained will be better articulated when this SDF is reviewed, which is proposed for every five years, in order to make necessary amendments based on project appraisals and the changing needs of the local communities. In this way, flexibility of the plan is enabled to allow for adaption and events which are difficult to predict or foresee in the future. The top key projects for the initial cycle of the duration of this SDF (2016-2021) are articulated briefly below.

### 5.4.1 Establish the TRUP Management Committee and Land Owners Association to Guide and Steer Development and Act as Decision-Makers in the Development Application Process

This project involves the creation of a management committee which will guide and steer the development of the site alongside the criteria set out in the SDF in chapter 4. This management committee will function as a microcosm of a local municipality and should be given decision-making power to accept or reject development applications, release and subdivide land for development, manage the sense of place, and develop intentional eco-communities. In this way, red-tape barriers and institutional boundaries with regards to lengthy application processes will be eliminated. Any development on the TRUP site should be steered and managed by this committee and management approaches will be developed and informed by it. This committee will be supported by the City of Cape Town and the Provincial Government. The committee will be composed and made up of private developers, land owners, government representatives at each sphere, academics, and built environment and ecological practitioners and professionals from a diverse range of backgrounds and specializations.

This committee will be supported by a land owner's association which will consist of land owners who will be consulted with regards to development applications and will be actively involved in the implementation of the framework.

#### 5.4.2 Green Planning and Development Hub Creation

A hub of activities relating to green infrastructure provision, research and development, ecological and environmental conservation facilities will be created to model good-practice ecological design and generate ideas relating to new pilot and research projects. This hub will exhibit green building considerations and will be located around the public square along the Station Road Extension.

#### 5.4.3 Movement of Valkenberg West Hospital to the Alexandra Precinct

In order to maximize on developable land and ensure the permeability and continuous access through the site, it is necessary to begin the process of moving the Valkenberg West Hospital residents and consolidating them within the Alexandra Precinct, near to the Alexandra Hospital to create a health district. The movement of the residents will make the historical buildings available for repurposing and densification and access and permeability will be improved through the removal of fences and high-security barriers.

#### 5.4.4 Creation of an Urban Park

The creation of an urban park to bring the presence of nature into the daily lives of existing and future residents is a key project which should begin immediately and continue for the duration of the SDF timespan. This park seeks to improve access to green open space, limit the use of motorized transport, provide a permeable surface for stormwater retention, connect people with nature, provide recreational activities, and provide a learning and research in conservation environment with the highest respect for nature.

#### 5.4.5 Rehabilitation, Restoration, and Enhancement of Natural Assets

The cleaning of rivers and the enhancement and restoration of the biodiversity and natural environment on the site is an urgent priority if the site and its innovative facilities are to be enjoyed by people. This project should be continuous and ongoing, constantly seeking ways to improve the quality of the natural environment.

#### 5.4.6 Planting of Flora, Food, and Trees

In all development cases, as well as through community building and responsibility for the natural environment, the planting of trees, flora, biodiversity, indigenous plants, greenery, and food will be mandatory. This will increase the

presence of nature and help to connect and integrate humans and nature more closely. It will also contribute to development which has a positive impact on the natural environment through direct human processes which seek to replenish and enhance the land and its quality.

#### 5.4.7 Leverage Private Sector and Civil Society Support and Encourage Buy-Ins through Incentives

Incentives should be explored, tested, and detailed in an incentive overlay guide in order to turn the site into a tax-haven, easily-developable area, and attractive investment opportunity. In this way, massive benefits and cost savings will be afforded to people who intentionally choose to live on and develop land on the site, provided these developments align with the SDF principles, values, approach, goals, vision, and criteria for positive and sustainable development.

#### 5.4.8 Develop Research Priorities and Create the Site to be a Place of Learning

Funding should be made available for innovative research projects at tertiary institutions in the Cape Town region which seek to engage the site and make proposals for

initiatives which model good-practice and ecologically sensitive development, intentional community building, and human-nature relationships at a number of scales, which span a number of disciplines.

#### 5.4.9 Land Reform

Land reform projects need to be undertaken to secure land for housing and agrarian reform to redistribute economic and housing opportunities on well-located land in the city of Cape Town. The TRUP site is well-located land which should be developed with inclusion of low-cost and subsidized housing. This will also help to ensure a social mix of people. These projects could innovatively engage private developers and land owners in talks and negotiations around partitioning off parts of their land for housing projects. The previously disadvantaged population could benefit immensely from these reforms and they could help alleviate poverty.

#### 5.4.10 Removal of Red-Tape Barriers Projects

Institutional thickness needs to be improved to leverage the human resource capacity to innovatively remove barriers to entry into formal financial systems, loans, business support, SETAs and housing projects. Barriers to positive development, such as legislation and policy which is outdated and long and tiresome development application

and EIA processes, should also be removed. Economic support can be extended into the informal economy as it is a legitimate form of employment.

#### 5.4.11 Create an LED Strategy

The development of a LED strategy is key to unlocking the context-specific economic opportunities on the TRUP site in terms of small businesses which are environmentally friendly and sustainable. The LED strategy should be approached from the bottom up with projects embedded in local communities and the informal sector and economy. It should provide considerations for business start-ups and the necessary infrastructure to enable artisan, green energy, agricultural, entrepreneurial, and craft-type economic activities which are complimentary to the idea of eco-sustainable living.

#### 5.4.12 Test a Number of Different Pilot Projects

This project essentially guides the development of smaller projects on the site which act as experiments in new ways of living and interacting with nature in cities, whereby development and nature live harmoniously and closely, as integral parts of the other's success. In order to evoke a paradigm shift in the way people think about, treat, and interact with the natural environment in a way which enables live, work, and play activities centered around

respect and responsibility towards nature through development, testing of different socio-ecological models is necessary. Failure is inevitable in some cases, but it will contribute to an environment of rich learning and innovative design and research.

#### 5.4.13 Public Transport

Public transport is key to improving access and mobility. Public transport and mobility projects will allow people to move around the Municipality and will allow for enriched lives and access to opportunities. It is also key to densification strategies and overlays to promote high densities around transport routes and nodes.

#### 5.4.14 Informal Economy

The informal economy should be supported and better understood. Acknowledging that it is a form of livelihoods, employment, and vibrancy in cities, the informal sector should be provided for and necessary infrastructure and support should be supplied.

### 5.5 Effective Implementation Considerations

It is essential to the implementation of this SDF that consideration and thought be given to the ways in which

implementation can be enhanced and most effective. Some of these ways are briefly explained below:

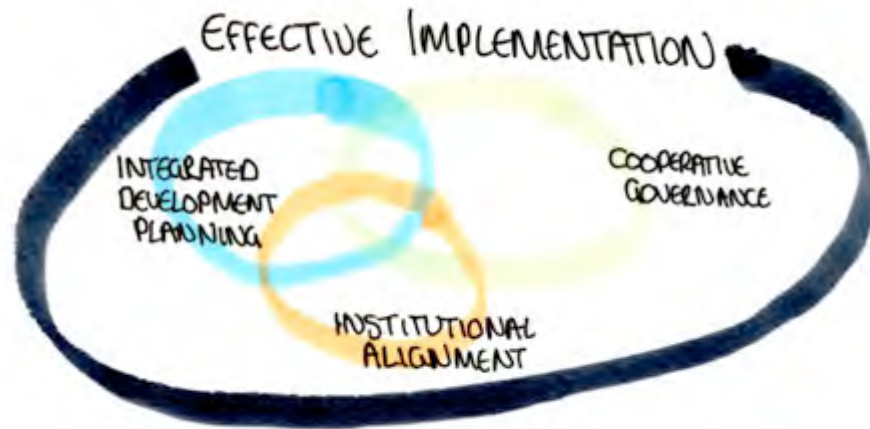


Figure 103: Effective Implementation (Source: Author, 2016)

### 5.5.1 Eco-Village and intentional Community Formation Considerations

The creation of tight community bonds and ties is essential to the implementation of the SDF. As a result, intentional communities should be carefully planned for and built, led by experts, practitioners, and ecological enthusiasts. In this regard, the implementation of intentional community creation takes precedent from the formation of the Lynedoch Eco-Village in Stellenbosch, South Africa, which

has already been referred to and explained briefly in chapter 4. This development managed to secure funding from various spheres of government and ensured a social mix of people through subsidized housing and community loans. Each private developer or land owner should agree to the terms set out in the SDF in terms of development guidelines before purchasing land and should take every reasonable precaution to ensure a positive impact on the natural environment results from the development of their land. Formation of communities should occur through a flexible variety of ways, advertised to civil society and through establishing profit-share initiatives and communal living conditions.

### 5.5.2 Positive Development Considerations Enforced and Monitored Through EIA

Strategic environmental Assessment should be employed with regards to the development of the site, with the EIA process as an integral tool to ensure zero-net loss, zero-negative impact, and mandatory positive impact of and on the natural environment. An EIA should be done for the whole site, organized through the Management Committee, as well as site-scale EIAs to ensure that any new developments or pilot projects adhere to the strictest standards of environmental responsibility, as though the natural environment was a subject of rights and an entity

which deserves the highest respect as a life-support and life-sustaining basis for development.

### 5.5.3 Institutional Alignment

It is essential, in the planning process, that the three spheres of government, private developers, and local scale steering and management committees work hand-in-hand, closely, and in an integrated way to align the processes, goals, principles, values, and strategies at all levels. Institutional alignment is essential for the planning and land use application processes to run effectively and to align resources at all levels of civil society and government. In this way, the principles, values, and strategies of the SDF and subsequent precinct plans, must be in line with those of the city, province and the country.

However, this is not the case in practice. According to a lecture by Matthew Cullinan (2016), there is a gap in South Africa between policy and actual implementation due to a mismatch and lack-of alignment between policies at different spheres of government and the ability for provincial and national resources to effectively contribute to interventions which are embedded in local communities and positively affect the lives of residents on the ground. This lack of alignment also leads to beurocratic inefficiencies such as delayed application processes, a lack of alignment between different processes (eg. Environmental and land use applications), and delayed

times between applications and approvals which affects investment potential and company retention. Additionally, there is a lack of coherence and active cooperation between departments in the municipality which limits effective strategy implementation further. Essential to the effective implementation of this framework is the alignment of different institutions, stakeholders, and communities with a common goal and vision, working together to enable a positive paradigm shift in the way humans and nature co-exist in the city.

### 5.5.4 Integrated Development Planning

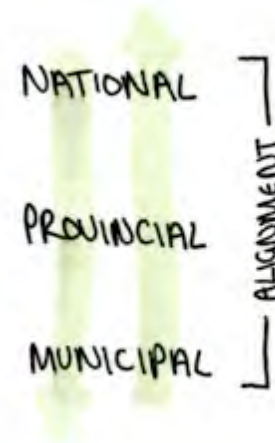


Figure 104:  
Institutional  
Alignment (Source:  
Author, 2016)

According to Botha (2015), integrated development planning is a participatory approach to integrate economic, sectoral, spatial, social, institutional and environmental strategies. An integrated approach is essential to the effective implementation of this SDF. This requires strategies and interventions which

cross a number of sectors and aim to have positive knock on effects on a variety of integrated issues. In this way, implementation should see planning of the site as a whole, where the different functions and institutions are integrated and communicate and collaborate on all projects. It is about creating cohesion across planning, implementation, monitoring and evaluation mechanisms through shared actions (Stellenbosch Municipality, 2014).

#### 5.5.5 Cooperative and Integrated Planning

Cooperative governance requires close alignment and cooperation between the three spheres of governance: national, provincial, and municipal. It is essential to the effectiveness of implementing this SDF that all three spheres of government are better aligned in terms of both funding and strategic public investment priorities (Figure 25). Provincial and national governments should act as support for municipal governments so as to better align policy and interventions with the situations on the ground.

#### 5.5.6 Budget and Funding Considerations

In terms of budgeting for implementation, project appraisals become important to assess the financial viability of projects on an ongoing basis. Budgeting also involves the leveraging of municipal, provincial and national funds and grants to increase the resource base of

the communities and committees, which will guide development, to effectively and strategically intervene. New and innovative ways of fundraising should be explored and implemented in order to creatively fund the positive and sustainable development envisaged for the site.

#### 5.5.7 Stakeholders

The municipality is the leader in implementing this SDF as it provides the institutional mechanisms, direction, and monitoring and evaluation of the plan. The municipality must, however, take into account the interests and influence of the private sector in development and growth. The private sector owns a significant portion of the land in the DM and the municipality must, as a result, engage cooperatively with the private sector through a wide range of partnerships. Local communities should also be seen as a vital part of the implementation of this SDF and participation should be enabled for community input in the planning and implementation process. It is the lives of the individuals in the communities whose lives will be affected by planning frameworks and decisions and as such they should be central to the process.

The most vital part of the implementation of this SDF is the innovative and creative engagement between various stakeholders in an integrated approach to work together.

This is incredibly important due to the fact that there are various boundaries (municipal, bioregional, provincial) which do not coincide with each other and which all involve complex management systems. These must be carefully coordinated in an integrated approach to planning. This will enable the working towards a shared vision and values to make decisions which will benefit the region and make it more sustainable.

#### 5.5.8 Monitoring, Review, and Evaluation

Ensuring that the planning framework remains relevant and well-implemented will be an ongoing process, which will require adaptation and change as the needs, context, environment, and circumstances change within present and future communities and as response is required to emerging issues. As a result, The SDF development process allows for much flexibility. The strategies and implementation of this SDF should constantly be monitored, reviewed, and evaluated in order to determine their success and maximize the efficient use of limited resources. This will be done through regular individual project appraisals, which will be evaluated alongside a set of appraisal values, as well as the review of the SDF alongside the criteria for sustainability, positive development, and permaculture and the principles, values, visions, and concepts illustrated in the

framework in chapter 4. According to Botha (2015), the implementation of the framework includes developing indicators for measuring progress and identifying opportunities or issues where appropriate. If the indicators show that the objectives of the framework are not being achieved, then a new or revised framework will need to be developed (Department of Rural Development and Land Reform, 2014).

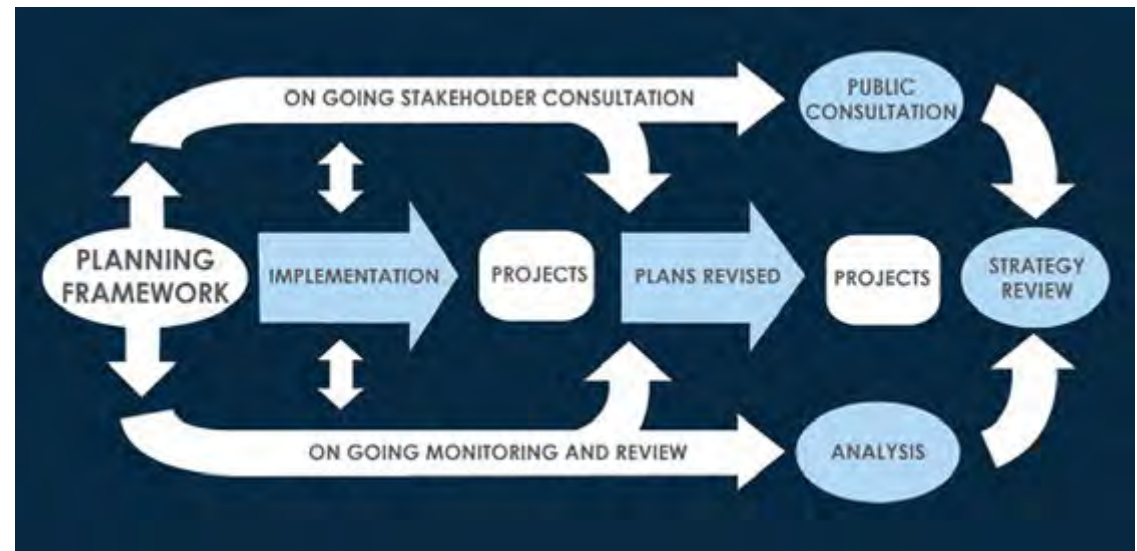


Figure 105: Monitoring, review, and Evaluation (Source: Botha, 2015)

### 5.5.9 Key Stakeholder Responsibilities

This section briefly describes the responsibilities of the major stakeholders in the implementation of the SDF as follows:

The TRUP Management Committee will be responsible for guiding and steering development and making decisions with regards to research, conservation, and development applications. Civil Society members who intentionally choose to consciously live closely with nature will form eco-sustainable communities. The City of Cape Town Municipality, The Western Cape provincial Government, and the National Government will provide support for the management committee and will provide the essential infrastructure, funding, and grants to enable the development. Private Developers will contribute to the sustainable development of the site by buying into the attractive investment environment created through incentives and will compete to exhibit the best-practice developments in terms of self-sufficiency and sustainability.

### 5.5.10 Advertising

Advertising of the site and the benefits of living, working, and playing in its rich natural environment, public realm, and positive built environment, is crucial to the successful implementation of the plan and to attract people who intentionally want to live closely with nature. Advertising is

also key to creating an image and sense of place for the site to guide and make clear its development intentions.

### 5.5.11 Public Participation

Public participation is key to sustainable planning and development of the site. Although the timeframe of this research did not allow for a full public participation process, the SDF developed should be subject to public participation processes before it is approved and legitimized as policy. The involvement of a number of stakeholders through public participation ensures an holistic approach and enables community decision-making and planning from the bottom-up for the people who will live on the site and benefit from its innovative facilities.

### 5.5.12 Public- Private and Other Partnerships

Finally, the creation and maintenance of innovative partnerships will ensure that there is cooperation between different stakeholders and will promote a cooperative approach which is a pilot project in itself in the South African context. A range of public-private partnerships, as well as partnerships with a range of other stakeholders will establish a sense of the need to work together to enable a paradigm shift and lead the way in exhibiting sustainable

and positive development which will integrate humans and nature closely on the site.

## 5.6 Conclusion

Having presented the implementation framework and a number of considerations for the effective implementation of the SDF from chapter 4, this chapter can be concluded. It is evident that a new approach to implementation is needed and necessary in order to innovatively give effect to the SDF. This approach favors and promotes partnerships, cooperation, and alignment between the various stakeholders. This approach also seeks to experiment with creative and innovative ways of living and designing with nature in the built environment. This implementation framework will see a deviation from static and often ineffective management approaches to development which are confined by institutional structures, budgetary constraints, and private developer interests. The highest respect and responsibility towards nature will be shown throughout the implementation process and development will be carefully guided to ensure positive and sustainable development. The next chapter will present the conclusion to this research dissertation.

## Chapter 6: Conclusion

### 6.1 Introduction

This chapter presents an overall conclusion to the research and proposals established throughout this dissertation process. It seeks to provide an overview of the process, a return to and discussion of the research questions from chapter 1, and a presentation of the research findings, implications, contributions, recommendations, and considerations for future planning and research at a number of scales. A reflection of the hopes and dreams for the site, a set of concluding thoughts, and a personal reflection will then be presented before the chapter, and therefore this dissertation is concluded.

### 6.2 Overview of the Research

This research and dissertation has presented an introduction to the site and the study and a literature review of the relevant theory to establish a theoretical framework for the study. This literature review discussed theory in the fields of development planning, strategic spatial planning, ecological planning, and philosophy regarding human-nature relationships. It also established a basis for which the current state of human-nature relationships can be understood. The research then

undertook an extensive analysis of the TRUP site, within its policy, legislative, current, district, municipal, provincial, and national context to describe the status quo and current environment. The research followed with the development and presentation of an SDF for the site which seeks to challenge unsustainable and anthropocentric development norms which have dominated the planning and development discourses for decades. This SDF made a set of proposals for strategic interventions on the site to enable more integrated human-nature relationships and guide responsible and positive development over a twenty year period. An implementation framework then followed from the SDF in order to present the considerations, projects, stakeholders, funding options, and timeframes necessary, through a phased approach, for the effective implementation of these strategic interventions, before the dissertation is concluded in this chapter.

### 6.3 Return to the Research Questions

This section returns to the research questions from the dissertation introduction in chapter 1 in order to assess what the findings of the research are in terms of responding to these questions. Since these questions sought to originally guide the dissertation research, design, and proposal processes, it is necessary to review the main and subsidiary research questions to establish the recommendations,

implications, and findings of the study. The research questions were as follows:

### 6.3.1 The Main Research Question

How can a more holistic approach to urban and environmental spatial development planning enable more integrated human-nature relationships on the TRUP site?

### 6.3.2 Subsidiary Research Questions

What is the nature of the current relationship between the natural environment and humans in Cape Town and on the TRUP site?

What new ways of thinking and living might be incorporated and mainstreamed into spatial planning to ensure a more sustainable future for cities?

What might planning learn from the principles of community-making through biomimicry and permaculture?

How could more integrated human-nature relationships benefit the city and the region?

How could planning for better integrated human-nature relationships in local area spatial planning help achieve the goals of the SDF, IDP, PSDF and NDP?

How may environmental management and planning be better integrated with planning for urban development on a local area scale?

How can the TRUP site be planned for future development to optimize both social and ecological wellbeing?

How may neighbourhood and settlement making be more sensitive to the environment on the TRUP site?

How may the principles of Permaculture be incorporated into the Spatial Development Framework for the TRUP site to enable more integrated human-nature relationships?

Are more integrated human-nature relationships possible on the TRUP site? If so, what is the role of planning, on a local level, in enabling this?

Are there ecological limits to growth in this region? Can this region be (more) self-reliant? What are the links and trade-offs between economic, sociocultural, and ecological sustainability in this region?

How do and should human-nature relationships play out in space?

What is the role of spatial planning on a local area and neighborhood scale to enable more integrated human-nature relationships?

What are the implications for ecosystem planning at a local level and what are the roles of the various stakeholders in enabling integration of environmental planning within the urban development discourse?

How can design within the disciplines of city planning, ecology, environmental management, biology, and urban design offer alternative and more sustainable ways of living, which may contribute to South Africa's housing policies and implementations?

How can the urban poor benefit from more sustainable integrated spatial planning?

In what ways may intentional communities develop on the sight around sustainable ways of living?

How can a local area plan enable spatial planning which has ecological and social sustainability at its core?

How might planning engage a range of stakeholders and disciplines in an integrated approach to ecological development planning?

How may positive development with zero-net loss and positive impact on the environment be imagined so as to contribute to replicable ideas within the planning discourse and policy in South Africa?

The responses to the research questions and a discussion of the extent to which they have been incorporated in the dissertation process is presented in the following sections.

#### 6.4 Findings of the Study

Guided by the above-mentioned research questions, a number of findings have become apparent throughout this dissertation's research process. They are presented briefly below:

Primarily, this dissertation has shown how spatial planning can incorporate ecological planning integrally in its process, thereby enabling more integrated human-nature relationships through a holistic approach. The findings point to the fact that in many urban contexts, the current state of human-nature relationships is fragmented and poor. This is as a result of anthropocentric approaches to urban spatial development, consumption and extractive models of

capitalism and consumerism which were born out of the industrial period and came to be as a result of modernism. As a result, urban areas have been separated from the natural environment and are fast becoming unsustainable fortresses of poor health, well-being, and decreased security in terms of the natural world's ability to provide essential goods and services which underpin human survival.

The study has found that a paradigm shift is necessary in order to integrate humans and nature and enable socio-ecological harmony, realizing the inseparability of the two within a single system. Rather than separate development and nature, this study presents theoretical and practical interventions and recommendations for both a systems and a balanced approach to development, which seeks to have a positive effect on the natural environment through positive development and sustainable urban growth. The incorporation of nature in all development processes has been found to have many benefits in terms of increasing food security, restoring, rehabilitating, protecting, and enhancing natural assets, and ultimately ensuring the sustainability of urban development.

The study has found that, provided the framework is implemented effectively, spatial planning can enable the development of positive urban environments through urban ecology and green infrastructure approaches. A

paradigm shift towards more responsible relations with the natural world has been found to be possible through the implementation of intentions and conscious eco-sustainable community formation and the principles of sustainability, positive development, and permaculture. The study has found that an unconventional and innovative approach to spatial and ecological planning is necessary to enable a paradigm shift towards more ecologically-conscious development and to enable communities who live closely with nature and the land to thrive on well-located land in urban areas. Ensuring a social mix of people will also allow for the provision of low-cost and subsidized housing.

Furthermore, the findings of this study include the realization that spatial planning at a local scale can in fact respond effectively to its dual mandate to promote access and densification of urban areas, and the increased integration of the natural environment, with no trade-offs or assumed inevitable negative impacts on either. The findings indicate that a range of cooperative partnerships are necessary to enable this paradigm shift in order to engage a range of stakeholders and provide education and research opportunities for the testing of pilot projects which seek to have a positive impact on the natural environment in the realms of economic development, industry, residential development, and socio-ecological systems.

## 6.5 Implications and Contribution of the Research

This research has implications for future planning and research on a number of scales. Furthermore, it seeks to make a contribution to research and policy in the field of strategic spatial planning which is concerned with the vital importance of the protection and enhancement of the natural environment and its integration in human and development systems. As previously mentioned, this study contributes to a paradigm shift in the way that nature is treated and incorporated within the planning context to enable urban ecology and positive development with no negative environmental impacts. It also makes a contribution to innovative approaches to the conservation of natural areas and continuous public open space systems and networks.

## 6.6 Recommendations for Future Planning and Research

In terms of recommendations for future planning and research, spatial planning should, in all cases and at all scales, aim to act as an enabler for the enhanced quality of human-nature relationships and their interactions within the realm of urban development and growth. Some further recommendations, which flag areas for future consideration, are as follows:

- Further research should be done in the form of specialist studies to understand the specific flora and fauna of the area, the water quality implications and potential to clean the rivers, the management of heritage resources, the establishment of a social mix and the state and potential for rehabilitation of the wetland and biodiversity systems.
- It is recommended that an in-depth EIA be undertaken for the site and for each specific development application on the site to ensure positive development and environmental enrichment.
- Further planning proposals and SDFs should seek to replicate the good-practice activities which this plan seeks to establish.
- Further research and planning policy should seek to understand nature's carrying capacity specifically and set limits for acceptable urban growth in order to close systems and create virtuous cycles of resource extraction and replacement and waste as a resource.
- It is recommended that future planning be based on ecological analyses of the specific site under question as the life support basis for any spatial policy, plan, or proposal.
- Research should be generated in order to establish a number of pilot projects based on the principles of permaculture, intentional communities, sharing

economies, and building and designing for and with nature.

- It is recommended that future planning and research seeks to replicate innovative and sustainable projects and strategies on other sites in the Cape Town metropolitan area.
- Further research should seek to examine whether alternative economic models are possible in isolation to the rest of society and whether or not off-grid infrastructure developments are possible to generate renewable energy on a large scale.
- It is recommended that future planning and research be conducted with regards to strengthening human-nature relationships through education of the benefits of the presence of nature and of food production in order to rigorously challenge unsustainable status quos.

## 6.7 Future SDF Development

The future SDF development process should aim to inform interventions from the bottom-up. Understanding and analyses of local communities, through resource allocation based on context-specific needs and projects embedded in local communities, should be used to inform budget alignment and the transfer of provincial and national grants. The planning process, instead of originating in

national and provincial frameworks and policies, which are far removed from the people which they affect, and which mandate national and provincial priorities, should be based on small scale, local area based planning to inform municipal planning, and in turn provincial and national planning and resource allocation. Furthermore, future SDF development should seek to incorporate natural assets and ecological planning as a fundamental informant to the satial planning process.

## 6.8 Further Planning that this SDF Will Inform

It is worthy of mention that due to the lack of public participation, this SDF must be seen as a first draft. A final version of the SDF is only going to be effective if it is informed by bottom-up participatory processes. Additionally, this SDF will inform a number of precinct plans for precincts on the site, which will seek to align area based management strategies and projects with the existing municipal and proposed local area SDF. These precinct plans should primarily aim to align their objectives and strategies with those envisioned through this local area SDF. These precinct plans should be created for the Oude Molen, Maitland Garden Village, Alexandra, River Club, Ndabeni, and Valkenberg West precincts. In order to illustrate the types of precinct plans imagined to follow from this research and proposed SDF, an example,

developed by the author in 2015 for the Oude Molen precinct, is presented in Appendix 7. These precinct plans will give effect to the required densities, intentional community formations, street types, and activities proposed broadly by this local area SDF. They will detail land subdivisions and should be developed and approved by the TRUP management committee, on the basis of the extent to which they satisfy the criteria for sustainability, the presence of nature in development areas, positive development, the integration of humans and nature through intentional and conscious living, and the proposed strategic interventions of this research, which challenges conventions and norms in terms of development planning.

## 6.9 Discussion of Scales

It is intended that the ideas generated through this SDF and research process be replicated at a number of different scales. These ideas should be incorporated in the metropolitan, provincial, and national legislation and policy and the conditions for the delegation of decision-making power to smaller organizations, such as the TRUP management committee, is encouraged. This will ensure alignment of policies aimed at both social and ecological wellbeing through responsible and positive development at a number of scales and will begin to shift the paradigm of the anthropocene towards ways of life which are

inseparable from nature and its processes, services, and life-giving attributes.

## 6.10 Brief Recommendations for Precinct Planners

It is recommended that precinct planners adhere to the principles, values, ethics, and ideas generated throughout the course of this research and replicate the strategic interventions and specific projects at the precinct scale. Alignment should be ensured between the SDF proposed in this dissertation and plans at a precinct scale.

## 6.11 Reflection of Hopes and Dreams for the Site

Before the final conclusion to this research is presented, a brief reflection of the hopes and dreams for the site are presented in this section. It is proposed that the trup site become a replicable model and example of a range of pilot projects around sustainable ways of living with the natural environment, building and designing with nature, and the formation and building of intentional communities. It is also proposed that the site become a well-connected and accessible site for the entire city which offers a range of sustainable movement and transport options. It is also intended that an urban park be created and maintained to harness the potential of the natural assets and intrinsic natural qualities of the site. This park will also buffer these

natural areas from development and offer a range of ecological services and recreational facilities which seek to enhance the sense of place and encourage community building.

## 6.12 Concluding Thoughts and Personal Reflection

In a final word of reflection, the author has learned immense lessons and has been challenged exceptionally by this dissertation and research journey. Though the process has not come without significant challenges and limitations, the author has developed a personal stance and position with regards to conducting human-nature relationships. The process has been one of great personal reflection and an enhancement of personal values and ethics and has provided a deep personal exploration on a topic of immense and significant interest.

## 6.13 Conclusion

In conclusion, this dissertation has sought to reverse the effects of industrialization on human-nature relationships and foster and enable integrated relationships between development and the natural environment and ecological and spatial planning. Since nature and its processes, goods, and services are essential as a basis for human life, human processes should be seen as being intertwined in a

single system with the natural world. Planning should echo this stance and enable this integration at a range of scales. Within the current context, it is a matter of urgency that planning responds to the mandate for the need to provide housing and promote development densification and intensification on well-located sites in the city, such as TRUP. However, just as urgent is the need for a paradigm shift in the way in which this planning is framed, executed, and implemented in order to foster strong human-nature relationships and integrate ecological and spatial planning towards creating a more sustainable future by piloting innovative strategies and interventions which allow mixed livelihoods to thrive in a way which exhibits the highest concern and responsibility for the earth and its finite resources.

By implementing the ideas and proposals that this dissertation has established, the development of the site will act as a major strategic intervention that has been shaped through a spatial argument. The successful and efficient implementation of this research and SDF has the potential to derive enormous benefits for civil society, private developers, private landowners, and the City of Cape Town on the whole. The unique natural quality of the site will be protected and a close relationship between humans (development) and nature (ecology) will be fostered, enabled, and promoted, allowing new ways of living with the natural world to thrive, despite their being

unconventional. This would ultimately result in Cape Town becoming a more sustainable city, which values the importance of ecology in urban areas and the inseparable integration of nature within the discourse of development, economics, and planning.

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# Appendix 1: Consent Form



**SCHOOL OF ARCHITECTURE, PLANNING AND GEOMATICS**  
University of Cape Town  
Private Bag x3, Rondebosch 7701  
Centlivres Building  
Email: [heather.martin@uct.ac.za](mailto:heather.martin@uct.ac.za) Tel: 27 21 6502374

## UNIVERSITY OF CAPE TOWN

June 2016

MY NAME IS TIMOTHY BLATCH AND I AM STUDYING TOWARDS MY MASTERS IN CITY AND REGIONAL PLANNING AT THE UNIVERSITY OF CAPE TOWN.

MY RESEARCH DISSERTATION TITLE IS 'TOWARDS MORE INTEGRATED HUMAN-NATURE RELATIONSHIPS: A LOCAL AREA SPATIAL DEVELOPMENT FRAMEWORK FOR THE TWO RIVERS URBAN PARK (TRUP) SITE.' AS PART OF MY MASTERS DISSERTATION AND I WOULD LIKE TO ASK YOU SOME QUESTIONS/TALK TO YOU IN ORDER FOR YOU TO ASSIST ME WITH MY RESEARCH.

I WOULD LIKE TO USE YOUR NAME, DESIGNATION AND POSSIBLY DIRECT QUOTES IN MY DISSERTATION AS A SOURCE OF INFORMATION. PLEASE INDICATE YES OR NO BELOW TO GIVE OR WITHOLD YOUR PERMISSION FOR ME TO DO THIS.

**YES I GIVE PERMISSION FOR YOU TO USE MY NAME / DESIGNATION / WORDS IN YOUR DISSERTATION**

**NO I DO NOT GIVE PERMISSION FOR YOU TO USE MY NAME / DESIGNATION /WORDS IN YOUR DISSERTATION**

IF YOU WANT TO END THE INTERVIEW AT ANY POINT YOU ARE FREE TO DO SO.

MY SUPERVISOR IS TANIA KATZSCHNER AND HER CONTACT DETAILS ARE [Tania.katzschner@uct.ac.za](mailto:Tania.katzschner@uct.ac.za); phone: 021 6502381:

.....  
Signature and designation (interviewee)

.....  
Signature of student

Application for Approval of Ethics in Research (EIR) Projects  
Faculty of Engineering and the Built Environment, University of Cape Town

**APPLICATION FORM**

**Please Note:**

Any person planning to undertake research in the Faculty of Engineering and the Built Environment (EBE) at the University of Cape Town is required to complete this form before collecting or analysing data. The objective of submitting this application prior to embarking on research is to ensure that the highest ethical standards in research, conducted under the auspices of the EBE Faculty, are met. Please ensure that you have read, and understood the EBE Ethics in Research Handbook (available from the UCT EBE Research Ethics website) prior to completing this application form: <http://www.ebe.uct.ac.za/ear/eberesearch/ethics.pdf>

APPLICANT'S DETAILS	
Name of principal researcher, student or external applicant	Timothy Blatch
Department	Architecture, Planning, and Geomatics
Preferred email address of applicant	timothyblatch@gmail.com
If a Student	Your Degree e.g. MSc, PhD, etc...
	Name of Supervisor (if supervised)
If this is a research contract, indicate the source of funding/sponsorship	
Project Title	

I hereby undertake to carry out my research in such a way that:

- there is no apparent legal objection to the nature or the method of research; and
- the research will not compromise staff or students or the other responsibilities of the University
- the stated objective will be achieved, and the findings will have a high degree of validity;
- limitations and alternative interpretations will be considered;
- the findings could be subject to peer review and publicly available; and
- I will comply with the conventions of copyright and avoid any practice that would constitute plagiarism.

SIGNED BY	Full name	Signature	Date
Principal Researcher/ Student/External applicant	Timothy Blatch		08-06-2016 Click here to enter a date
APPLICATION APPROVED BY	Full name		Date
Supervisor (where applicable)	Tania Katzschner		08-06-2016 Click here to enter a date
HOD (or delegated nominee) Final authority for all applicants who have answered NO to all questions in Section 1, and for all Undergraduate research (including Honours)	Click here to enter text		Click here to enter a date
Chair : Faculty EIR Committee For applicants other than undergraduate students who have answered YES to any of the above	G. S. Hole Click here to enter text		8/7/2016 Click here to enter a date

## Appendix 3: Integrated Solutions

### *Ecological Approaches in Planning for Sustainable Cities*

City	Japan: Kawasaki Eco Town Program	Zero waste industrial ecosystem	<ul style="list-style-type: none"> <li>• Reduce greenhouse gas emissions</li> <li>• Energy conservation</li> <li>• Waste management by turning one's waste into another's raw material</li> </ul>	<a href="http://www.davidrisstrom.org/100GreenAchievements/100GA-MelbournePrinciples.html">http://www.davidrisstrom.org/100GreenAchievements/100GA-MelbournePrinciples.html</a>
City	South Africa: Johannesburg Green House People's Environmental Centre Project	Community involvement and education with urban gardening and green building principles	<ul style="list-style-type: none"> <li>• Provide an environmental demonstration and training centre for the citizens through small community gardens</li> <li>• Enhance the quality of community's life by providing them a sustainable living such as organic farming, medicinal herb gardening</li> </ul>	<a href="http://www.mcdonough.com/speaking-writing/the-hannover-principles-design-for-sustainability/#VHuxvYun38s">http://www.mcdonough.com/speaking-writing/the-hannover-principles-design-for-sustainability/#VHuxvYun38s</a>
City	Germany: Freiburg Green City	The green and solar capital of Germany	<ul style="list-style-type: none"> <li>• Sustainable economy (environmental industry and research, eco-industrial tourism)</li> <li>• Sustainable mobility (environmentally compatible modes of transport)</li> <li>• The city's resource capital: nature (parks and nature conservation areas, emission control, soil protection, premium quality water)</li> <li>• Sustainable urban development (far-sighted planning and citizen participation)</li> <li>• Citizen commitment (environment education)</li> </ul>	<a href="http://www.wpi.edu/Pubs/E-project/Available/E-project-121312-175421/unrestricted/One_Planet_Living_for_WPI.pdf">http://www.wpi.edu/Pubs/E-project/Available/E-project-121312-175421/unrestricted/One_Planet_Living_for_WPI.pdf</a>
Global	The Melbourne Principles for Sustainable Cities by the United Nations Environment Programme	Creating environmentally healthy, vibrant and sustainable cities	<ul style="list-style-type: none"> <li>• A long-term sustainability vision</li> <li>• Economic and social security</li> <li>• Biodiversity and ecosystem conservation</li> <li>• Minimise the ecological footprint of cities</li> <li>• Model cities as ecosystems</li> <li>• Provide a sense of place</li> <li>• Empower people and foster participation</li> <li>• Cooperative networks towards sustainability</li> <li>• Sustainable production and consumption</li> <li>• Provide a good urban governance</li> </ul>	
Global	The Hannover Principles by William McDonough and Michael Braungart	Designing for sustainability	<ul style="list-style-type: none"> <li>• Rights of humanity and nature to co-exist</li> <li>• Interdependence between humans and nature matter</li> <li>• Responsibility for the consequences of design</li> <li>• Safe objects of long term value</li> <li>• Eliminate the concept of waste</li> <li>• Rely on natural energy flow</li> <li>• Understand the limitations of design</li> <li>• Share knowledge for constant improvement</li> </ul>	
Global	The One Planet Living Framework by BioRegional Development Group and World Wildlife Fund	A vision for sustainable world	<ul style="list-style-type: none"> <li>• Zero carbon</li> <li>• Zero waste</li> <li>• Sustainable transport</li> <li>• Sustainable materials</li> <li>• Local and sustainable food</li> <li>• Sustainable water</li> <li>• Land use and wildlife</li> <li>• Culture and heritage</li> <li>• Equity and local economy</li> <li>• Health and happiness</li> </ul>	

## Appendix 4: Best Practice Examples of Sustainable Development From Around the World

Table 1: Exemplar best practices on urban sustainability (derived from McDonough and Partners, 1992; Newman and Jennings, 2008; Danish Architecture Centre, 2012; BioRegional Development Group, 2012; City of Freiburg, 2012)

Scale	Project	Background	Targeted Sustainability Goals	Project Website
Building	Germany: Commerzbank Headquarters	An ecological skyscraper	<ul style="list-style-type: none"> <li>• Provide natural day lighting and ventilation through the sky gardens and operable windows</li> <li>• Maximise energy efficiency through double skin facades and the use of water-filled chilled ceilings for cooling</li> <li>• Maximise water efficiency through grey water recycling</li> </ul>	<a href="http://sustainability2009.commerzbank.com/reports/commerzbank/annual/2009/ab/eng/3060/commerzbank-tower-the-worlds-first-green-building.html">http://sustainability2009.commerzbank.com/reports/commerzbank/annual/2009/ab/eng/3060/commerzbank-tower-the-worlds-first-green-building.html</a>
District	England: Cleveleys New Wave Project	A flood and coastal defence strategy plan	<ul style="list-style-type: none"> <li>• Break flood waters by building a wave of concrete stairs</li> <li>• Waste management by reusing the materials from the old sea wall</li> <li>• Provide a pedestrian promenade with a diverse variety of leisure and recreational activities</li> </ul>	<a href="http://data.prism.net.au/aspis-case-studies/view.php?id=64">http://data.prism.net.au/aspis-case-studies/view.php?id=64</a> <a href="http://www.urbanecology.org.au/eco-cities/christie-walk">http://www.urbanecology.org.au/eco-cities/christie-walk</a>
District	Australia: Adelaide Christie Walk Eco-Village Project	An environmentally friendly neighbourhood	<ul style="list-style-type: none"> <li>• Reduce energy consumption through passive design, use of heat-efficient materials and vegetation</li> <li>• Proximity to services and public transport</li> <li>• Waste reduction and recycling</li> <li>• Improve water consumption through sustainable stormwater management</li> <li>• Provide on-site food production with creation of communal gardens</li> </ul>	<a href="http://www.advancedfp7.eu/Home/AD-Projects-Map/Model-City-Mannheim">http://www.advancedfp7.eu/Home/AD-Projects-Map/Model-City-Mannheim</a>
City	Germany: Model City Mannheim (MOMA)	A smart city that promotes energy efficiency by using solar energy and smart control technologies (i.e. Energy Butler system)	<ul style="list-style-type: none"> <li>• Connect every household with a smart-energy network</li> <li>• Raise the awareness of households about their energy habits and general energy prices</li> <li>• Help households to cut their energy bills by using energy efficient technologies</li> <li>• Reduce the energy prices</li> </ul>	<a href="http://library.tac-ate.ca/proceedings/2002/calgary.pdf">http://library.tac-ate.ca/proceedings/2002/calgary.pdf</a> <a href="http://geo.jp/gee/IN/Activities/2005/Eco-Towns/GEC.pdf">http://geo.jp/gee/IN/Activities/2005/Eco-Towns/GEC.pdf</a> <a href="http://www.greenhouse.org.za">http://www.greenhouse.org.za</a>
City	Canada: Calgary's C-Train Ride the Wind Program	A wind-powered light rail transit system	<ul style="list-style-type: none"> <li>• Provide sustainable modes of transportation</li> <li>• Provide a better air quality by reducing greenhouse gas emissions</li> <li>• Reduce car dependency</li> </ul>	<a href="http://www.ecotippingpoints.org/our-stories/indepth/germany-freiburg-sustainability-transportation-energy-green-economy.html">http://www.ecotippingpoints.org/our-stories/indepth/germany-freiburg-sustainability-transportation-energy-green-economy.html</a>

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### Ecological Approaches in Planning for Sustainable Cities

City	Japan: Kawasaki Eco Town Program	Zero waste industrial ecosystem	<ul style="list-style-type: none"> <li>• Reduce greenhouse gas emissions</li> <li>• Energy conservation</li> <li>• Waste management by turning one's waste into another's raw material</li> </ul>	<a href="http://www.davidrisstrom.org/100GreenAchievements/100GA-MelbournePrinciples.html">http://www.davidrisstrom.org/100GreenAchievements/100GA-MelbournePrinciples.html</a>
City	South Africa: Johannesburg Green House People's Environmental Centre Project	Community involvement and education with urban gardening and green building principles	<ul style="list-style-type: none"> <li>• Provide an environmental demonstration and training centre for the citizens through small community gardens</li> <li>• Enhance the quality of community's life by providing them a sustainable living such as organic farming, medicinal herb gardening</li> </ul>	<a href="http://www.mcdonough.com/speaking-writing/the-hannover-principles-design-for-sustainability/#.VHuxvYun38s">http://www.mcdonough.com/speaking-writing/the-hannover-principles-design-for-sustainability/#.VHuxvYun38s</a>
City	Germany: Freiburg Green City	The green and solar capital of Germany	<ul style="list-style-type: none"> <li>• Sustainable economy (environmental industry and research, eco-industrial tourism)</li> <li>• Sustainable mobility (environmentally compatible modes of transport)</li> <li>• The city's resource capital: nature (parks and nature conservation areas, emission control, soil protection, premium quality water)</li> <li>• Sustainable urban development (far-sighted planning and citizen participation)</li> <li>• Citizen commitment (environment education)</li> </ul>	<a href="http://www.wpi.edu/Pubs/E-project/Available/E-project-121312-175421/unrestricted/One_Planet_Living_for_WPI.pdf">http://www.wpi.edu/Pubs/E-project/Available/E-project-121312-175421/unrestricted/One_Planet_Living_for_WPI.pdf</a>
Global	The Melbourne Principles for Sustainable Cities by the United Nations Environment Programme	Creating environmentally healthy, vibrant and sustainable cities	<ul style="list-style-type: none"> <li>• A long-term sustainability vision</li> <li>• Economic and social security</li> <li>• Biodiversity and ecosystem conservation</li> <li>• Minimise the ecological footprint of cities</li> <li>• Model cities as ecosystems</li> <li>• Provide a sense of place</li> <li>• Empower people and foster participation</li> <li>• Cooperative networks towards sustainability</li> <li>• Sustainable production and consumption</li> <li>• Provide a good urban governance</li> </ul>	
Global	The Hannover Principles by William McDonough and Michael Braungart	Designing for sustainability	<ul style="list-style-type: none"> <li>• Rights of humanity and nature to co-exist</li> <li>• Interdependence between humans and nature</li> <li>• Respect relationships between spirit and matter</li> <li>• Responsibility for the consequences of design</li> <li>• Safe objects of long-term value</li> <li>• Eliminate the concept of waste</li> <li>• Rely on natural energy flow</li> <li>• Understand the limitations of design</li> <li>• Share knowledge for constant improvement</li> </ul>	
Global	The One Planet Living Framework by BioRegional Development Group and World Wildlife Fund	A vision for sustainable world	<ul style="list-style-type: none"> <li>• Zero carbon</li> <li>• Zero waste</li> <li>• Sustainable transport</li> <li>• Sustainable materials</li> <li>• Local and sustainable food</li> <li>• Sustainable water</li> <li>• Land use and wildlife</li> <li>• Culture and heritage</li> <li>• Equity and local economy</li> <li>• Health and happiness</li> </ul>	

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Table 2: Exemplar best practices on ecological planning

Project	Ecological Planning Approaches	Achievements	References
Germany:Stuttgart's climate planning strategy	<ul style="list-style-type: none"> <li>The use of green infrastructure such as:                             <ul style="list-style-type: none"> <li>ventilation lanes (tree-flanked arteries)</li> <li>climate-relevant open spaces such as public parks</li> <li>roof greening</li> <li>facade greening</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Turning an industrial city into a cool and green city:                             <ul style="list-style-type: none"> <li>manage urban heat island with natural wind patterns and vegetation</li> <li>protect biological diversity</li> <li>improve air quality</li> <li>reduce traffic related noise pollution</li> <li>provide large and connected green spaces for cooling and shading</li> </ul> </li> </ul>	Danish Architecture Centre (2012)
South Korea: The Cheonggye River Restoration Project	<ul style="list-style-type: none"> <li>Stream design (water supply and Management)</li> <li>Environmentally friendly waterfront by landscape design</li> <li>Environmentally friendly transport system</li> <li>High-quality modern residences</li> <li>Restoration of historical relics</li> </ul>	<ul style="list-style-type: none"> <li>Transforming a freeway into a river and public park:                             <ul style="list-style-type: none"> <li>reduce the heavy vehicular traffic</li> <li>provide a natural drainage system</li> <li>prevent flooding risk due to impermeability</li> <li>improve water quality and nourish wildlife by landscape planning</li> <li>provide a recreational waterfront for inhabitants</li> </ul> </li> </ul>	Danish Architecture Centre (2012)
UK:The BedZED (Beddington Zero Energy Development) Eco-Village	<ul style="list-style-type: none"> <li>Energy efficient buildings</li> <li>Water saving appliances</li> <li>Use of renewable energy sources</li> <li>Waste recycling</li> <li>Biodiversity plan for the urban natural environment</li> <li>Green transport plan (public transport, rental car clubs, cycle routes and storage facilities)</li> </ul>	<ul style="list-style-type: none"> <li>An eco-friendly housing development:                             <ul style="list-style-type: none"> <li>zero emission neighbourhood</li> <li>resource-efficient way of life</li> <li>enhanced the biodiversity and natural amenity value</li> <li>less car dependent lifestyle</li> </ul> </li> </ul>	BioRegional Development Group (2002)

Sweden:Malmö Bo01 Ecological District	<ul style="list-style-type: none"> <li>Energy efficient buildings</li> <li>Wind parks that supplies the electricity of the area</li> <li>Recycling of food waste as biogas for electricity and heat generation</li> <li>Rainwater management through green roofs, ponds, wetlands and rain water channels</li> <li>Green spaces such as parks, woodlands, flower gardens and green roofs</li> <li>Built-in nesting boxes for birds</li> <li>High priority of designing pedestrian and cycle tracks</li> </ul>	<ul style="list-style-type: none"> <li>An eco-friendly housing development:                             <ul style="list-style-type: none"> <li>increase the biological diversity</li> <li>stormwater management</li> <li>use of renewable sources</li> <li>green transport</li> <li>waste management</li> <li>energy conservation</li> <li>green architecture</li> <li>ecologically aesthetic urban environment</li> <li>open urban spaces for recreational activities</li> </ul> </li> </ul>	Hancock (2001) Danish Architecture Centre (2012)
Germany:Emscher Park Brownfield Redevelopment	<ul style="list-style-type: none"> <li>The use of green infrastructure such as greenbelts, public gardens</li> <li>Thematic tourist driving and biking route called 'route of industrial culture'</li> <li>Multi-use urban waterfront including energy-efficient offices</li> <li>Adaptive reuse of industrial buildings</li> <li>Recycle and reuse of industrial wastes in the park design</li> <li>Walls used for rock climbing</li> </ul>	<ul style="list-style-type: none"> <li>Turning a degraded industrial region into a regional network of open spaces:                             <ul style="list-style-type: none"> <li>enhance the ecological health of Emscher river and its tributaries</li> <li>regenerate the degraded landscape</li> <li>provide social and cultural activities</li> <li>preserve the historic industrial heritage</li> <li>provide local employment</li> </ul> </li> </ul>	Danish Architecture Centre (2012)
USA:New York High Line Park	<ul style="list-style-type: none"> <li>Native and low-maintenance landscape design</li> <li>Green roof and technologies for water drainage</li> <li>public open spaces for people</li> <li>Energy-efficient lighting design</li> <li>benches and other structures made of wood from certified sustainable forests</li> </ul>	<ul style="list-style-type: none"> <li>Turning an old elevated railway into a green corridor:                             <ul style="list-style-type: none"> <li>better microclimate and environmental conditions</li> <li>an urban habitat for wildlife and people</li> <li>urban regeneration and adaptive reuse</li> <li>an economically productive neighbourhood</li> </ul> </li> </ul>	Danish Architecture Centre (2012)
USA:Seattle Green Factor	<ul style="list-style-type: none"> <li>A scoring system which calculates ecologically effective urban area by assigning an ecological value to the each type of existing landscape element such as:                             <ul style="list-style-type: none"> <li>groundcovers, shrubs, trees</li> <li>porous pavements</li> <li>green roofs</li> <li>green walls</li> <li>water features, rain gardens</li> <li>drought tolerant plants</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>A parcel scale landscape management strategy for ecological city vision:                             <ul style="list-style-type: none"> <li>promote urban green spaces</li> <li>improve the ecological function and richness of the urban environment</li> <li>urban heat island management</li> <li>stormwater management</li> <li>soil protection</li> </ul> </li> </ul>	SenStadium (2012) Seattle DPD (2012)

Hong Kong:The Building Environmental Assessment Method (HK-BEAM)	A rating tool that provides a guidance to developers, designers on green development practices	<ul style="list-style-type: none"> <li>•Site aspects</li> <li>•Materials aspects</li> <li>•Energy use</li> <li>•Water use</li> <li>•Indoor environmental quality</li> <li>•Innovations</li> </ul>	HK-BEAM (2004)
The European Commission:Building Environmental Quality for Sustainability through Time (BEQUEST) international framework	A tool for sustainable urban development, helps decision-makers to examine the strengths, weaknesses and gaps in development projects	<ul style="list-style-type: none"> <li>•Development activity</li> <li>•Environmental and societal issues</li> <li>•Spatial level</li> <li>•Time scale</li> </ul>	Hurley and Horne (2006)
The European Commission:System for Planning and Research in Townsand Cities for Urban Sustainability (SPARTACUS)	An integrated land use/transport model for analysing urban sustainability	<ul style="list-style-type: none"> <li>•Air pollution</li> <li>•Resource consumption</li> <li>•Health</li> <li>•Equity</li> <li>•Opportunities</li> </ul>	European Commission (1998)
The European Commission:Planning and Research of Policies for Land Use and Transport for Increasing Urban Sustainability (PROPOLIS)	A model system for defining sustainable long-term urban strategies and demonstrating their effects	<ul style="list-style-type: none"> <li>•Global climate change</li> <li>•Air pollution</li> <li>•Consumption of natural resources</li> <li>•Environmental quality</li> <li>•Health</li> <li>•Equity</li> <li>•Opportunities</li> <li>•Accessibility and traffic</li> <li>•Total net benefit from transport</li> </ul>	Spiekermann and Wegener (2007)
UK:Environmental Impact Estimating Design Software (ENVEST)	A software tool that estimates the life cycle environmental impacts of a building from the early design stage	<ul style="list-style-type: none"> <li>•Resource (Fossil fuel depletion/ extraction, minerals extraction, water extraction)</li> <li>•Environmental loadings (Climate change, acid deposition, ozone depletion, human toxicity, low level ozone depletion, eco-toxicity, eutrophication, waste disposal)</li> </ul>	Seo (2002)
Canada:The ATHENA Environmental Impact Estimator	A Life cycle assessment-based environmental decision support tool for buildings	<ul style="list-style-type: none"> <li>•Embodied primary energy use</li> <li>•Global warming potential</li> <li>•Solid waste emissions</li> <li>•Pollutants to air</li> <li>•Pollutants to water</li> <li>•Natural resource us</li> </ul>	Seo (2002)
UK: The South East England Development Agency (SEEDA) checklist	A sustainability checklist for developments in order to highlight best practice & regionally specific sustainability & planning issues	<ul style="list-style-type: none"> <li>•Climate change &amp; energy, transport &amp; movement, ecology, energy &amp; water efficient building</li> <li>•Resources protection</li> <li>•Community support, sensitive place making</li> <li>•Support for business</li> </ul>	Karol and Brunner (2009)
The Netherlands: Eco-Quantum	A tool calculating the environmental performance of a building over its total life span	<ul style="list-style-type: none"> <li>•Resources</li> <li>•Emissions</li> <li>•Energy</li> <li>•Waste</li> </ul>	Bruno and Katrien (2005)
Norway: Eco-Profile	An environmental assessment tool for buildings	<ul style="list-style-type: none"> <li>•External Environment</li> <li>•Resources</li> <li>•Indoor climate</li> </ul>	Pettersen (2000)

## Appendix 5: International Sustainable Development Indicators

Table 4: Overview of international sustainability indicator initiatives (derived from Leicestershire County Council, 2008; Vancouver City Council, 2009; London Sustainable Development Commission, 2009; Mahoney *et al.*, 2010; Sustainable Measures, 2012)

Country	Sustainability Indicator Initiative	Project Detail
	City of Sydney	A city program to develop a vision, goals and strategies in the areas of environment, transport, economy, city design, culture, community and governance
Australia	Victoria Community Indicators Project City of Melbourne	Well-being indicators for all the local governments in the state of Victoria A number of environmental indicators in the areas of air quality, biodiversity, buildings, litter and transport
	City of Gosnells Sustainable Development Initiative	Environmental Management Plan 2006-2009 has objectives with measurable indicators
	Sustainable Calgary	Inspired by Sustainable Seattle, this group has published several "State of Our City" reports with sustainability indicators
Canada	Sustainable Vancouver Plan	The plan sets out nine major goal areas: climate change; environment and public health; resource conservation; transportation; economic development; land use; the built environment; social equity; and civic engagement
	City of Atlanta Sustainability Plan	A plan that encourages the community dedicated to environmental sustainability through innovative leadership
	Fife Regional Council, Fife House	Sustainability Indicators for Fife lists a number of indicators including economy, environment, housing, and quality of life
Europe	London Quality of Life Indicators	The Commission has identified 23 headline Quality of Life Indicators to monitor London's progress towards becoming a sustainable city
	Leicester Community Sustainability Indicators	A Sustainable Community Strategy sets out our priorities for improvement in Leicestershire
	Sustainable Seattle	Sustainable Seattle was one of the first organizations to produce sustainable community indicators grouped into four broad areas: environment, population and resources, economy, culture and society
	Sustainable Chattanooga	A Sustainability Plan focuses on environment, energy, transportation, economic development, neighbourhoods, crime and safety
	Portland Comprehensive Plan	The city has a vision and a strategic plan with sustainable development goals and indicators
United States	Sustainable Community Roundtable of South Puget Sound	The Sustainable Community Roundtable was one of the nation's first grassroots organizations promoting the vision and principles of sustainability
	Austin Sustainable Community Initiative	The city of Austin has compiled information and resources on 11 categories of actions to promote sustainability
	Santa Monica Sustainable City Program	The plan covers goals including resource conservation, environmental and public health, transportation, economic development, open space and land use, housing
	Minneapolis Sustainability Initiative	Sustainability Initiative is reporting on progress towards specific goals relating to housing, health and safety, equity, learning, connected communities, arts and culture, environment, and economy

Appendix 6: Benefits of Green Infrastructure on Ecosystem Services

Sample Ecosystems Services Benefits of GI	Summary Description	Sample References
Drainage Management	Managing the flow of surface and/or subsurface water through biomimicry that uses less energy intensive and expensive engineering solutions than those traditionally employed.	Brown and Caldwell et al., 2011; Chau, 2009; Ellis, 2012; EPA, 2010; Grant, 2012; Hoyer et al., 2011; Novotny et al., 2010; NYC, 2010; Podolsky and MacDonald, 2008; Stenning, 2008; USEPA, 2004
Habitat Provision	Establishing suitable areas and environmental conditions for individual organisms and ecological communities to thrive.	Andrés-Olive and Dios-Leima, 2012; Beatley, 2010; CGIF, 2011; Erickson, 2006; Hostetler et al., 2011; Mell, 2013; Naumann et al., 2011; NE, 2009; Pankhurst, 2012; Rouse and Bunster-Ossa, 2013; Sandström, 2008; Selman, 2012; TEP, 2011; Williamson, 2003
Ecological Connectivity	Creating functionally contiguous land and water habitats that facilitate multi-scalar connectedness of ecological processes (e.g. species dispersal, nutrient transfer, hydro-ecological flow).	Allen, 2012; Benedict and McMahon, 2006; CF, 2007; Cornhar, 2010; Davies et al., 2006; Flink et al., 1993; Francis and Chadwick, 2013; Hamilton and Selman, 2005; Hasse, 2010; Hellmund and Smith, 2006; Jongman and Pungetti, 2004; Karribites and Owen, 2006; Leitao et al., 2006; Silva et al., 2010; Sylwester, 2009; Walmsley, 2006
Landscape Conservation	Managing ecological processes, land uses and social-ecological interactions that define and associate a mosaic of areas across a broad scale. It involves balancing habitat provision and ecological connectivity (see above), with sustainable social and economic patterns of use.	Allen, 2012; Boothby, 2000; de Groot et al., 2010; LI, 2013; Mell, 2010; Plieninger and Bieling, 2012; Rouse and Bunster-Ossa, 2013; Selman, 2006, 2012
Health, Well-Being & Community Development	Promoting positive individual and communal physical, psychological and social conditions. This entails fulfilling and enhancing a range of different needs, including: basic requirements, (food and energy); developmental necessities (outdoor education and community development opportunities); and growth facilitation (contact with nature).	CABE, 2009; Coucher et al., 2007; Dunn, 2010; EC, 2012; EKN, 2012; Entrix, 2010; Geller, 2003; LI, 2009; Maas et al., 2009; Ong and Peterson, 2011; SG, 2011, 2012; Shackell and Walker, 2012; Takano et al., 2002; Tzoulas et al., 2007; van den Berg et al., 2010; Ward Thompson, 2011

## Conceptual Development and Use of Theory in Design

Timothy Blatch: Studio Project A, 2015

The process of exploration of different theories and concepts used in the design of the Oude Molen Precinct

The final images combined as one spatial image, showing density, footprints, and the consequences of public use from the first block, then using the second block.

**Evolution of the Precinct from Public-Designed Grid**

The grid structure and the organization of the building footprint are the result of a series of conceptual sketches. The grid structure is based on the existing street layout and the public-Designed Grid. The building footprint is based on the grid structure and the public-Designed Grid.

**Evolution of the Precinct from Public-Designed Grid**

The grid structure and the organization of the building footprint are the result of a series of conceptual sketches. The grid structure is based on the existing street layout and the public-Designed Grid. The building footprint is based on the grid structure and the public-Designed Grid.

**Linkage, Permeability, Legibility, Access, and Integration**

The design process is a conceptual process, starting with the existing context of the site and the public-Designed Grid. The design process is a conceptual process, starting with the existing context of the site and the public-Designed Grid. The design process is a conceptual process, starting with the existing context of the site and the public-Designed Grid.

**Series of Conceptual Sketches for the precinct design**

■ Very private pedestrianized street space  
■ Public-Designed Grid (Building)  
■ Legible public-Designed Grid (Building)  
■ Public-Designed Grid

# Proposed Blocks, Building Guide Lines, Figure Ground, and Cadastrals

## Blocks

The proposed grid of the Guide Miles Project offer diversity and a range of experiences. They range in use and shape. They aim to maximize legibility and permeability within the guidelines of existing roads, buildings, and proposed nodes of activity.

## Build-to Guide Lines

The building guidelines are designed in such a way that active edges provide active street frontage, as far as possible. In some cases, predominantly along major movement routes, buildings are set back maximally in order to accommodate a pedestrian walkway.

## Figure Ground

The figure ground for the project incorporates good design principles such as perimeter block development with a clear hierarchy of space from public on the streets to very private in central block yards. It also takes on sustainable initiatives/courtyard developments. Larger buildings are placed along major routes.

## Cadastrals

The property boundaries are a range of different shapes and sizes. This is to allow a variety of choice, diversity, and richness. It also means a range of tenure options can be accommodated. Larger, single owned properties are more common along commercial routes. All properties are accessible from the street.



Timothy Blatch: Studio Project A, 2015

The above set of diagrams show the legibility of the proposed precinct and how it can be intensified and densified to become a mixed-use sustainable neighborhood. Thresholds of space are also established using the figure ground. The diagrams, additional-



# Precinct Layout: Hierarchy of Spaces and Street Designs

Proposed Precinct Layout showing hard and soft space networks, parking, hierarchies of space, and access to perimeter blocks and individual properties. This layout is used to illustrate different hierarchies of movement and different street sections which will make up the public realm.

● Tertiary Route: Mixed Use

● Tertiary Route: Pedestrian Only

● Secondary Route: Mixed Use

● Primary Route: Mixed Use

Legend:

- Bus Stop
- Pedestrian Zone
- Light Rail and Bicycle Lanes
- Primary Street
- Building

# Introducing the Model: Three-Dimensional Proposal

Model from different angles

Building Mass

Perspectives

This model is an extension of the previous figure-ground, contextual, density, height, building footprint, and block sizes for the Grade Molen precinct. This model allows the built footprint to become clear, as well as allowing for height, density, building mass, and hard and soft spaces to be illustrated. The model is shown from a variety of angles and perspectives in order to see the full extent of the design. The final revised design incorporates all of the theory used throughout this presentation.



Building mass perspective and view of model from street facing perspective



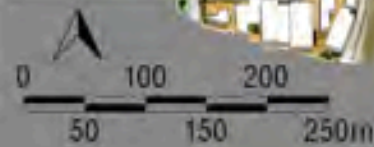
Building mass perspective and view of model from a street facing perspective



Building mass perspective and view of model from a street facing perspective



Building mass perspective and view of model from a street facing perspective

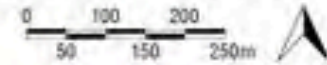


Movement systems, corridors, open spaces, hard and soft spaces, and the way in which the building mass shapes the public space and realm are illustrated further in the different angles of the model

Timothy Blatch: Studio Project A, 2015

# Proposed Precinct Designs and Phasing for Development of Building Mass

Timothy Blatch: Studio Project A, 2015



The aim of the design is to maximize choice by providing a range of mixed use heights, densities, land tenures, uses, and ownership opportunities. This will allow for experimentation with a range of public-private partnerships, densities along transport routes, and mixed use developments which are sustainable

## Proposed Phasing of Building Mass



Appendix 8: Signed Consent Forms

 **SCHOOL OF ARCHITECTURE, PLANNING AND GEOMATICS**  
University of Cape Town  
Private Bag x3, Rondebosch 7701  
Centurion Building  
Email: heather.martins@uct.ac.za Tel: 77 21 6502374

UNIVERSITY OF CAPE TOWN  
June 2016

MY NAME IS TIMOTHY BLATCH AND I AM STUDYING TOWARDS MY MASTERS IN CITY AND REGIONAL PLANNING AT THE UNIVERSITY OF CAPE TOWN.

MY RESEARCH DISSERTATION TITLE IS "TOWARDS MORE INTEGRATED HUMAN-NATURE RELATIONSHIPS: A LOCAL AREA SPATIAL DEVELOPMENT FRAMEWORK FOR THE TWO RIVERS URBAN PARK (TRUP) SITE," AS PART OF MY MASTERS DISSERTATION AND I WOULD LIKE TO ASK YOU SOME QUESTIONS/TALK TO YOU IN ORDER FOR YOU TO ASSIST ME WITH MY RESEARCH.

I WOULD LIKE TO USE YOUR NAME, DESIGNATION AND POSSIBLY DIRECT QUOTES IN MY DISSERTATION AS A SOURCE OF INFORMATION. PLEASE INDICATE YES OR NO BELOW TO GIVE OR WITHOLD YOUR PERMISSION FOR ME TO DO THIS.

YES I GIVE PERMISSION FOR YOU TO USE MY NAME / DESIGNATION / WORDS IN YOUR DISSERTATION


NO I DO NOT GIVE PERMISSION FOR YOU TO USE MY NAME / DESIGNATION / WORDS IN YOUR DISSERTATION

IF YOU WANT TO END THE INTERVIEW AT ANY POINT YOU ARE FREE TO DO SO.

MY SUPERVISOR IS TANIA KATZSCHNER AND HER CONTACT DETAILS ARE  
Tania.katzschner@uct.ac.za; phone: 021 6502381.

**Signed**  
TANIA KATZSCHNER  
Signature and designation (interviewee)  
CANDIDATE PLANNER &  
ASSISTANT URBAN DESIGNER

**Signed**  
Signature of student

 **SCHOOL OF ARCHITECTURE, PLANNING AND GEOMATICS**  
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**Signed**  
TANIA KATZSCHNER  
Signature and designation (interviewee)  
CANDIDATE PLANNER &  
ASSISTANT URBAN DESIGNER

**Signed**  
Signature of student



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 University of Cape Town  
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**Signed**

Signature and designation (interviewee)

**Signed**

Signature of student



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**Signed**

Signature and designation (interviewee)

PRINCIPAL PROFESSIONAL OFFICER,  
 DEVELOPMENT FACILITATIONS UNIT (DFU),  
 CITY OF CAPE TOWN

**Signed**

Signature of student



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**NO I DO NOT GIVE PERMISSION FOR YOU TO USE MY NAME / DESIGNATION / WORDS IN YOUR DISSERTATION**

IF YOU WANT TO END THE INTERVIEW AT ANY POINT YOU ARE FREE TO DO SO.

MY SUPERVISOR IS TANIA KATZSCHNER AND HER CONTACT DETAILS ARE tania.katzschner@uct.ac.za phone: 021 6502381.

**Signed**

Signature and designation (interviewee)

*candidate planner & assistant urban designer.*

**Signed**

Signature of student



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UNIVERSITY OF CAPE TOWN

June 2016

MY NAME IS TIMOTHY BLATCH AND I AM STUDYING TOWARDS MY MASTERS IN CITY AND REGIONAL PLANNING AT THE UNIVERSITY OF CAPE TOWN.

MY RESEARCH DISSERTATION TITLE IS 'TOWARDS MORE INTEGRATED HUMAN-NATURE RELATIONSHIPS: A LOCAL AREA SPATIAL DEVELOPMENT FRAMEWORK FOR THE TWO RIVERS URBAN PARK (TRUP) SITE.' AS PART OF MY MASTERS DISSERTATION AND I WOULD LIKE TO ASK YOU SOME QUESTIONS/TALK TO YOU IN ORDER FOR YOU TO ASSIST ME WITH MY RESEARCH.

I WOULD LIKE TO USE YOUR NAME, DESIGNATION AND POSSIBLY DIRECT QUOTES IN MY DISSERTATION AS A SOURCE OF INFORMATION. PLEASE INDICATE YES OR NO BELOW TO GIVE OR WITHOLD YOUR PERMISSION FOR ME TO DO THIS.

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