



DEVELOPMENT FRAMEWORK

August 1998

THE WATERFRONT TEAM

in association with

MLH Architects & Planners
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**ELSIESKRAAL RIVER VALLEY
DEVELOPMENT FRAMEWORK
AUGUST 1998**

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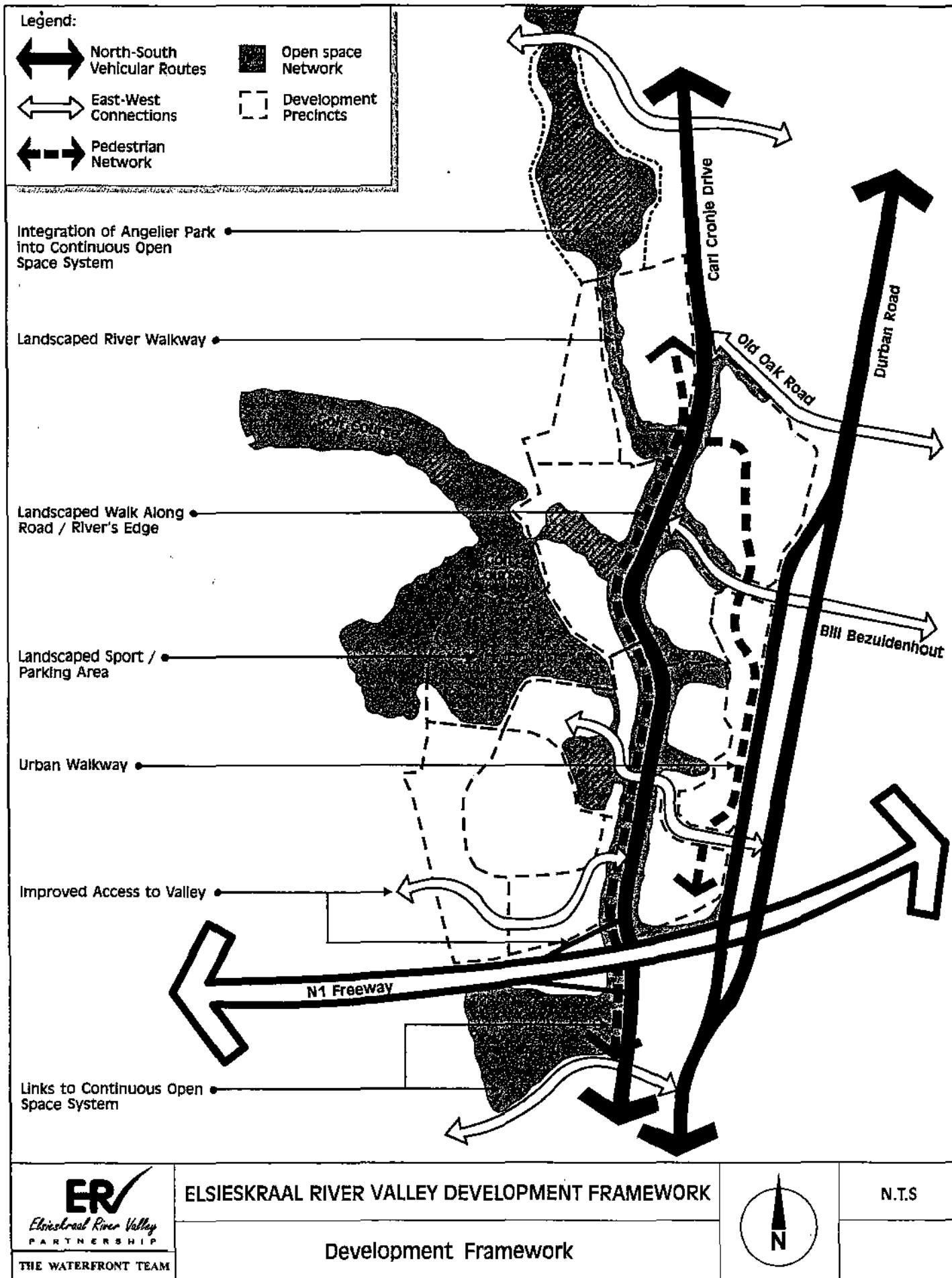
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EXECUTIVE SUMMARY

In November 1997 the City of Tygerberg held an Indaba with major landowners and other interested and affected parties in the Elsieskraal River Valley (ERV). The Indaba concluded that an overall growth management strategy co-ordinated by the major landowners was needed in order to grow the ERV to its full potential. In March 1998 The Waterfront Team was appointed by the ERV Partnership, a grouping of the landowners and the City, to take this thinking further.

The Waterfront Team's brief was to produce a Development Framework which focuses on policies for improving and upgrading the public environment with the aim of improving the functions, operations and interrelationship of the main stakeholders. In this way, it was suggested, land values would be maintained and possibly increased with an expansion in the rates base of the City of Tygerberg. The Development Framework was to be supported by a study on development bulk/services capacity analysis and infrastructure costing. It was intended that the Development Framework would form the basis of a strategic growth management plan for the ERV.

With this brief, The Waterfront Team analysed the context of the ERV (Sections 3, 4 and 5) and the local environment in terms of the natural and built environment (Sections 6 and 7). Following this analysis and an assessment of development opportunities and constraints in the ERV (Section 8), a Development Framework Plan (Section 9) was produced.

As agreed at the November 1997 Indaba, the vision for the ERV is that:

"THE ELSIESKRAAL RIVER VALLEY BECOMES A MAJOR MULTI-PURPOSE REGIONAL DESTINATION AND A KEY BUILDING BLOCK IN THE FINANCIAL BASE AND IDENTITY OF THE NEW CITY OF TYGERBERG".

Added to this, the Waterfront Team sees the ERV becoming a special environment highly suitable for office development. In providing a physical framework as a vehicle for achieving this vision, this document provides policies on four major components, namely a Bulking and Land Use Plan (Section 10), a Public Space and Urban Design Framework (Section 11), a Movement and Parking Framework and a Landscaping and Greening Framework (Section 13). The financial implications of this planning have been assessed (Section 15) and an organisational structure (Section 16) for implementing the Development Framework has been recommended.

The Development Framework Plan identifies the key physical elements which will shape future development in the ERV. These are:

1. The two north-south vehicular routes of the Durban Road corridor and Carl Cronje Drive.
2. Three east-west connecting roads (Mispel Road, Bill Bezuidenhout Drive and Old Oak Road).
3. Two new components of the road infrastructure (N1 off-ramp and/or link road between Hoheizen and Carl Cronje Drive).
4. Two different types of north-south pedestrian routes, (one associated with the river corridor west of Carl Cronje Drive, the other, associated with developments on Willie van Schoor Drive) with at least one clearly defined east-west pedestrian connection.
5. An open space network which provides a link between the various forms and elements in the ERV.

This Development Framework also includes development policies which, if applied, are intended to produce a public environment beneficial to all ERV Partners and members of the public.

These policies are :

1. Development Bulk Policies

- 1.1 Permit additional development rights on University of Stellenbosch and City of Tygerberg land up to 370 500 m² subject to a detailed traffic impact assessment.
- 1.2 In those precincts with existing retail development rights, permit office development instead of retail development subject to standard environmental, town planning and traffic considerations.
- 1.3 Other than the sites identified above, rezoning applications for properties within the ERV which attract significant increases in commercial and/or office bulk should not be favourably considered by the City of Tygerberg.

2. Land Use Policies

- 2.1 Achieve a rich and diverse urban environment by promoting a balanced and reinforcing mix of activities.
- 2.2 In order to promote the long term economic sustainability of the ERV, the development precincts should be integrated through the use of pedestrian and vehicular linkages.
- 2.3 The withdrawal of the reversionary clause should be negotiated between the University of Stellenbosch and City of Tygerberg in order to develop the university land for a mix of education, residential, offices and commercial purposes.
- 2.4 The benefits of developing the existing Golf Driving Range site for commercial use should be assessed.
- 2.5 The amount of land on the Sportika site north of the Velodrome which could be released for development should be assessed. This development should complement and reinforce the Velodrome, such as an office development, conference facilities, a training academy or hotel.
- 2.6 Develop the Mini-Cape site to its full potential subject to
 - a) developing an alternative site for the Bowling Club;
 - b) a detailed financial assessment of the potential benefits for the City of Tygerberg; and
 - c) recommendations on implementing an open space network as indicated in this Development Framework.
- 2.7 Higher density residential development should form the transition between the ERV and the lower density residential areas to the west and south.

3. Public Space Policies

- 3.1 The creation of a network of publicly-accessible urban spaces of varying character and size and that relate to the adjacent land uses and activities, should be encouraged.
- 3.2 A continuous landscaped public pedestrian walkway should be developed along the entire length of the western edge of Carl Cronje Drive and where appropriate, incorporate the river course itself as the main defining element.
- 3.3 Development on private land to the west of this walkway should be encouraged to permit access off this walkway and the river system at designated points.
- 3.4 Parking areas and access roads in developments flanking Willie van Schoor Drive should allow for a safe north-south pedestrian route.
- 3.5 The parking areas to the north and south of the Velodrome/Bellville Stadium should be developed into multi-functional public spaces.
- 3.6 Public areas should be planned and designed to ensure safety, management and control. This includes adequate lighting and visibility.
- 3.7 The technical and financial feasibility of building elevated pedestrian bridges across Bill Bezuidenhout Drive and Carl Cronje Drive should be investigated.
- 3.8 The southern portion of the Mini-Cape site should be designated as public open space and allow for related tourist and leisure facilities.

4. Urban Design Policies

- 4.1 Development and land uses along the Elsieskraal River should contribute to the continuity of the public walkway system.
- 4.2 Opportunities to create defining urban elements on appropriate sites such as landmark buildings, spaces and features should be explored.
- 4.3 Views and vistas should inform and guide building location and height.
- 4.4 The natural features of the Valley, i.e. the Elsieskraal River and escarpment should inform the location, scale and height of buildings.
- 4.5 The orientation and scale of buildings should relate to the public environment.

5. Movement and Parking Policies

- 5.1 Improvements to the network in the East Service Area of the City of Tygerberg, which will alleviate the negative impacts of through-traffic in the ERV, should be identified and implemented.
- 5.2 The individual development proposals which require an increase in bulk, changes to land-use and/or changes in access arrangements should be evaluated in conjunction with detailed traffic impact assessments.
- 5.3 Well-located parking areas which can be shared between ERV Partners, should be developed.
- 5.4 The technical and financial feasibility of developing a parking facility to address the shortage of parking on the Durban Road Corridor should be investigated; such a development would be subject to a traffic impact assessment.
- 5.5 A public transport system within and to the study area from the Bellville CBD should be promoted as part of the long term transportation improvements in the ERV and East Service Area.
- 5.6 The cost calculations of the N1 half-diamond and access road from Hoheizen should be updated and the technical and environmental aspects should be evaluated by the City of Tygerberg prior to engaging with the appropriate authorities to obtain approval for these proposals.

6. Landscaping and Greening Policies

- 6.1 An overall planting theme should be created for the Valley. This theme should be based on indigenous species.
- 6.2 The natural river course should be enhanced through appropriate landscaping and every effort should be made to provide a natural course and finish for canalised areas.
- 6.3 A suitable portion of land to the west of Carl Cronje Drive should be identified and landscaped for the purpose of a continuous public pedestrian walkway.
- 6.4 The pedestrian spine and river area should be landscaped in accordance with the requirements of the stormwater system, the natural and visual attributes of the area and the movement patterns of vehicles and pedestrians entering properties to the west of the walkway.
- 6.5 The eastern edge of Carl Cronje Drive should be landscaped and the median planted to create a boulevard. This should be done in accordance with a co-ordinated landscaping plan.
- 6.6 The urban walk along Willie van Schoor Drive should be landscaped to provide a safe and user-friendly environment.
- 6.7 The edge of Bill Bezuidenhout Drive should be landscaped to reduce the scale of the road and create a sense of place.

- 6.8 The parking area to the south of the Bellville Stadium should be enhanced through appropriate hard and soft landscaping.
- 6.9 The parking/pedestrian area to the north of the Velodrome should be enhanced through appropriate hard and soft landscaping.
- 6.10 The "Forecourt" park on the Mini-Cape site should be landscaped to provide an entrance to the river-walk and allow for a variety of uses.
- 6.11 The escarpment and sensitive slopes should be protected, stabilised and planted.
- 6.12 Valuable tree lines should be retained and appropriate screenplanting should be provided to separate different uses and activities.
- 6.13 Screenplanting should be considered to soften the edge of the Waste-Tech site.
- 6.14 The ERV Partnership and PAWC should resolve the development/non-development and landscaping of the visually important site on Durban Road/Willie van Schoor Drive at the southern entrance to the ERV. In the interim, the proliferation of mobile signs should be curtailed.

7. Management Policy

- 7.1 An organisational structure similar to that of a Business Improvement District (BID) should be established in order for the ERV Partnership to control and manage development in the ERV for the benefit of all ERV Partnership members.
- 7.2 A safety and security plan should be prepared to ensure the management of activity and movement within the area.

A significant finding of the study is that if all development rights are taken up in the next 20 years, over 29 000 permanent jobs could be created. While it is not the purpose of this study to assess whether this rate of growth will occur, it is postulated that the implementation of the above policies will improve the chances of achieving this rate of growth. For this reason it is important that the ERV Partnership continue with the level of co-operation achieved during the compilation of this report.

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1.0 INTRODUCTION & BRIEF

The Elsieskraal River Valley (ERV) or 'Tyger Valley' as it is more commonly known, has over the last ten years enjoyed phenomenal growth and development to become a popular destination for an array of activities. As recently as the early 1980's most of the Valley was still used for the mining of clay and stone, but the construction of the Tyger Valley Centre marked a new phase during which the area developed into a high quality regional destination.

Today, the ERV is not only known for its shopping facilities. The various A-grade office developments have shaped its reputation as a sought-after corporate address. Furthermore, the multifunctional sporting facilities that are located in the Valley have played host to a variety of events. Its central location within the context of both the City of Tygerberg and the Cape Metropolitan Area makes the ERV highly accessible and has supported the economic viability of its development.

Apart from its central location and the variety of activities on offer, the underlying success factor that has set the ERV apart from the rest is its unique physical environment. The Elsieskraal River, natural escarpments and remnant water-filled quarries are testimony to this environment. In addition, its proximity to the agricultural hinterland provides exciting opportunities for both economic and tourism development.

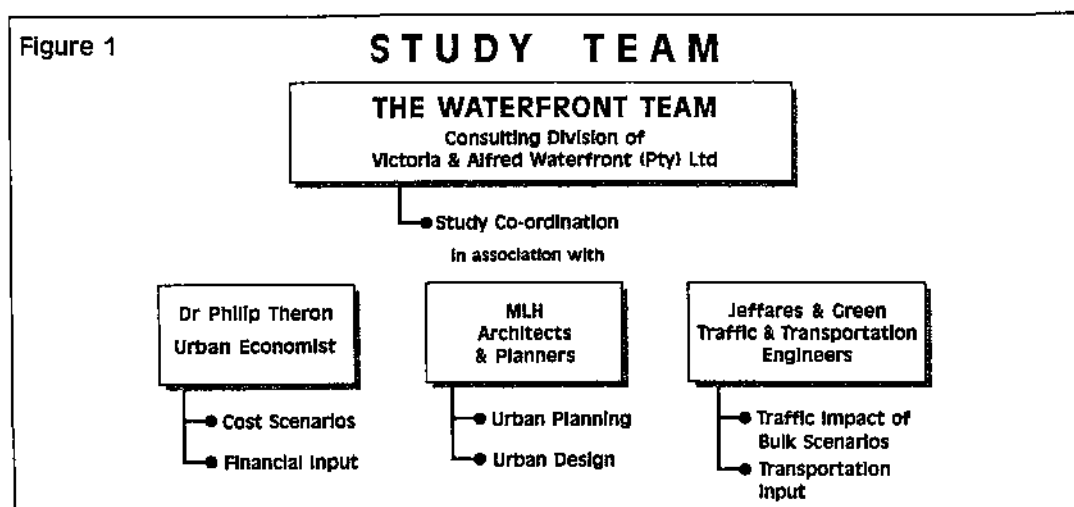
In the context of competing metropolitan-wide projects there is a need for the ERV to retain its competitive edge in the market place. Acknowledging this need, the City of Tygerberg is seeking to provide a planning framework which capitalises on the above assets and stimulates long term economic growth.

The ERV Partnership, which entails the close co-operation of all stakeholders in the planning, financing, development and management of the public environment, is the first step towards achieving these goals.

1.1. Background To The Elsieskraal River Valley Development Framework

The City of Tygerberg initiated discussions between itself, the landowners, and other major interested and affected parties within the ERV at an Indaba that was held in November 1997. The aim was to reach agreement on a possible new vision for the area and a framework for future co-operation between the major landowners. It was the first important step forward for land development in the Elsieskraal River Valley. At the Indaba the need for a joint venture between all stakeholders in the area was identified. With a large percentage of the total approved bulk rights still undeveloped, the establishment of the ERV Partnership was regarded as necessary to ensure that further development takes place in an integrated manner and within an overall growth management strategy.

In February 1998 the Waterfront Team was approached to formulate a Development Framework for the Elsieskraal River Valley as the first step towards a growth management strategy for the Valley. The Waterfront Team, together with its specialist consultants (Figure 1) were appointed and the study commenced in March 1998.

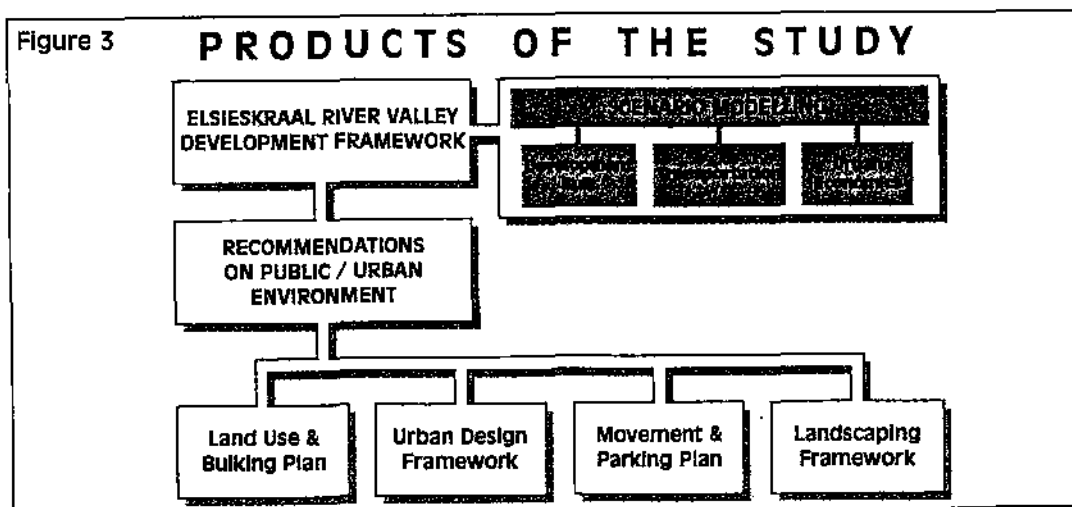
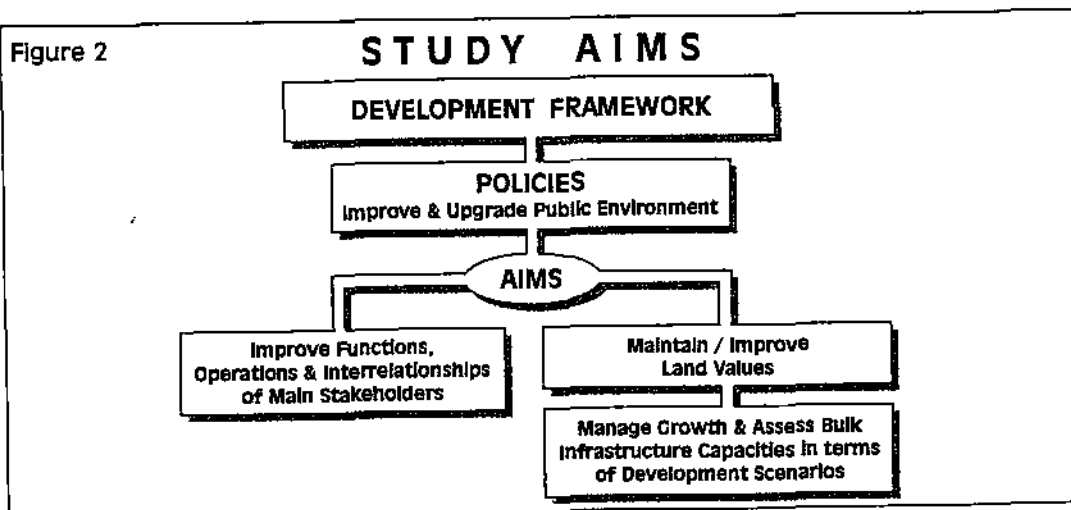


1.2. Brief

The purpose of the study was to establish an optimal development scenario for the ERV and to provide performance criteria for the management and development of the various identified components of the public environment (Figure 2). The Development Framework report focuses on policies for improving and upgrading the public environment. The aim of these policies is to improve the functions, operations and interrelationships of the main stakeholders, thereby maintaining and possibly, increasing their land values, and so expanding the rates base for the City of Tygerberg.

The recommendations contained in the Development Framework are supported by a study on development bulk/services capacity analyses and infrastructure costing which will enable the City of Tygerberg to prioritise the funding of future infrastructure required in the area.

The study was completed within 12 weeks and followed by presentations to ERV Partnership members and the Consultative Forum. Figure 3 indicates the major components of the study. This report has been reviewed in light of comments received from ERV Partnership and Consultative Forum members.



2.0 THE STUDY AREA

For the purpose of this study, the ERV can broadly be defined as the area bound by Angelier Park and the Old Oak Road Extension to the north, Willie van Schoor Drive to the east, and the N1 freeway to the south. To the west Hoheizen, Welgemoed and the Bellville Golf Course border it. The ERV covers a total area of 204 ha (Figure 4).

2.1 Historical background

Hume Pipe Company originally owned the bulk of the land in the Valley and utilised the site for clay mining and quarrying stone. Besides the mining rights, the company also had industrial zonings for portions of the property. The then Municipality of Bellville bought the land from Hume Pipe in 1979 because of a concern that the development of these industrial rights would negatively effect the surrounding residential areas. In 1980 the Municipality sold 68 ha of land to the University of Stellenbosch for the establishment of a satellite campus. The donation was subject to a restrictive condition that if the property was developed or sold for a use other than education, ownership of the land would revert back to the Council. The reversionary clause is still applicable.

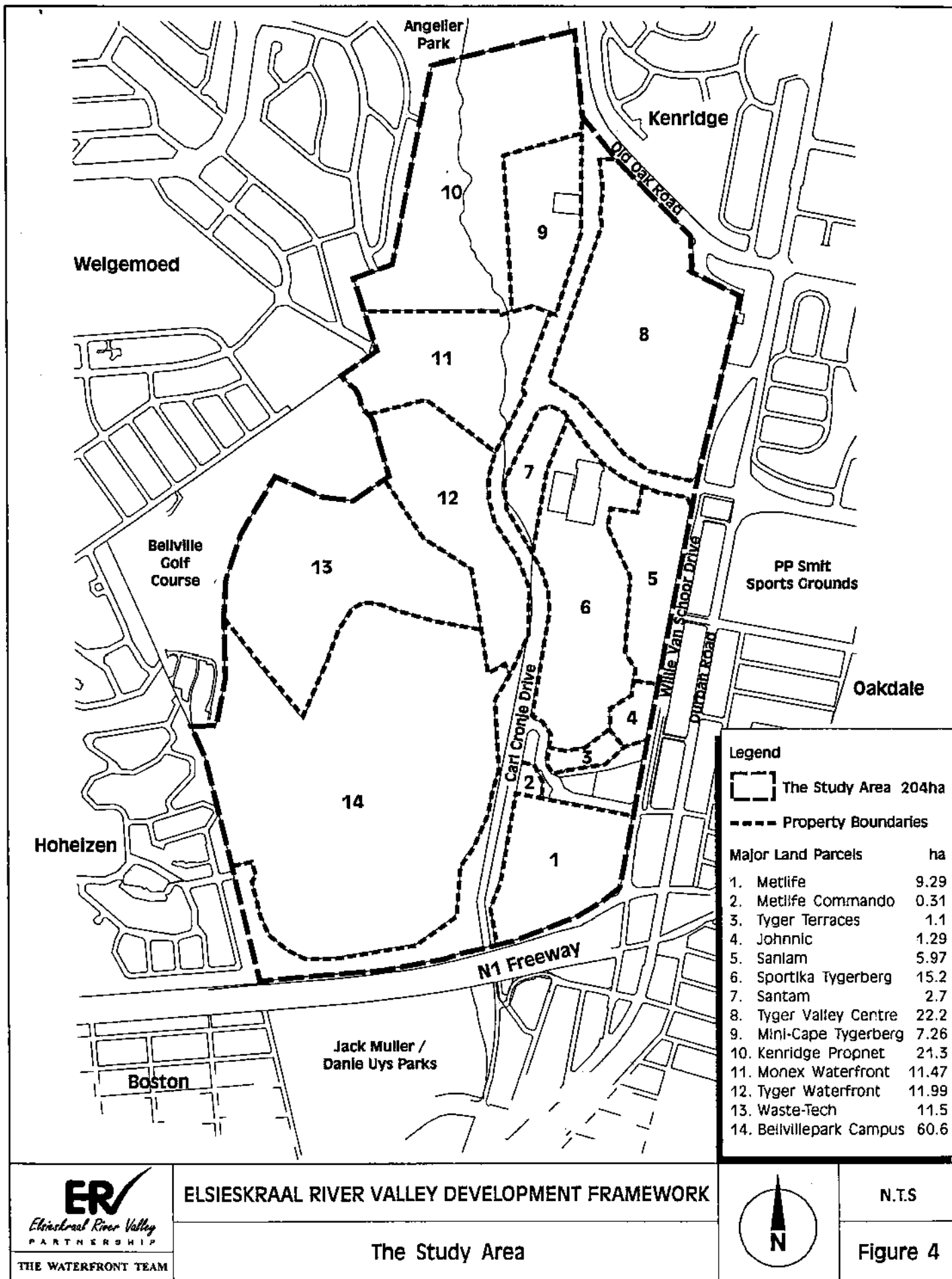
The prison on the northern part of the study area was originally built for the purpose of housing the convict labour that was used to quarry stone in the Valley. The stone was transported to the Bellville Station by rail. With the closure of the prison, the railway line was removed, and the portion of land, which today is owned by Propnet, was used by the then South African Transport Services (SATS) as a nursery. SATS also sold some of their land to the University, who, based on their long term planning for the development of a campus for 21 000 students, required additional land for sports fields.

In 1984 the Municipality appointed consultants to prepare a master plan for the development of a major complex catering for 12 different sports codes, on 26,5 ha of land to the east of Carl Cronje Drive. Lack of finances however later forced both the Municipality and the University to alter their development plans and sell off portions of their land. The University established only some of their planned facilities as the need arose and sold off the land they bought from SATS to the Tiger Waterfront Company.

The Tiger Valley Shopping Centre opened in 1985 in the midst of a major recession, and although initially it was geographically isolated, it provided an impetus for further development in the Valley. It was from 1988 onwards that the Centre flourished. During the same period Metropolitan Life acquired land next to the N1 freeway for the development of an office park and the Municipality approved the construction of the Health & Racquet Club as a starting point for their sports complex. This was followed by the construction of the Bellville Athletic and Cycle Tracks. The Municipality also sold off 14 ha of land to Sanlam for the development of an office park.

The implementation of three substitution schemes along the Willie van Schoor Drive/Durban Road two-way couplet during the early 1990's was another important incentive that stimulated development in the area.

It is mainly over the last ten years that the Valley has experienced rapid development and has established itself as one of the fastest growing commercial and office nodes in the Cape Metropolitan Area (CMA). It is however this rate of growth that has required the current landowners in the ERV to work together and formulate a growth management strategy that will ensure the sustainability of the existing and future development in the Valley.



2.2 Role-players in the ERV Partnership

As stated at the first Landowners Indaba, the strength of the ERV Partnership lies in the diversity of the stakeholders in the study area. The landowners range from private development companies, financial organisations, to education, semi-public and public institutions.

Each of the landowners has particular needs and problems that can only be successfully addressed by means of a co-operative approach as well as particular abilities and competencies that will be beneficial to the partnership. The key success factor to sustainable growth in the ERV will be the cooperation of all the stakeholders. The current ERV Partners are:

- ♦ City of Tygerberg;
- ♦ Metropolitan Life;
- ♦ Monex;
- ♦ Propnet;
- ♦ Sanlam;
- ♦ Santam;
- ♦ Tyger Terraces;
- ♦ Tyger Valley Centre;
- ♦ Tyger Waterfront Company; and
- ♦ University of Stellenbosch

2.3 Ownership

Some of the properties in the ERV comprise a combination of erven. For the purpose of this study, the erven are regarded as single land parcels. Ownership of the land parcels in the study area is as follows:

- ♦ **City of Tygerberg :**
 - Sportika (15,2 ha) - Contains the Bellville Athletics Track and Velodrome, as well as three leased commercial sites
 - Mini-Cape (7,26 ha) – Vacant except for Doordkraal substation and a portion used by the Old Oak Bowling Club
- ♦ **Metropolitan Life :**
 - Parc du Cap/Metropolitan (9,29 ha) – Established office park and head office building currently under construction
 - Commando (0,31 ha) – Bellville Commando building being redeveloped as a recreational facility for Metlife staff
 - Metlife is also a co-owner of the Tyger Valley Shopping Centre
- ♦ **Monex:**
 - Monex Waterfront (11,47 ha) – Vacant site with unique natural features
- ♦ **Propnet**
 - Kenridge (21,3 ha) – Includes the old prison site as well as the most pristine portion of the Elsieskraal River in the study area
- ♦ **Sanlam:**
 - Tijger Park (5,97 ha) – Established office park with new building under construction
- ♦ **Santam:**
 - The Santam Head Office (2,7 ha) – Two office buildings developed

- ♦ **Tyger Terraces:**
 - Tyger Terraces (1,1 ha) – Vacant site of which a portion is used for parking for the sports facilities
- ♦ **Tyger Valley Centre:**
 - Tyger Valley Shopping Centre (22,2 ha) – Established regional shopping centre that is currently being extended
- ♦ **Tyger Waterfront Company;**
 - Tyger Waterfront (11,99 ha) - Vacant site with unique natural features
- ♦ **University of Stellenbosch:**
 - Bellvillepark Campus (60,6 ha) – Largely undeveloped site containing academic and campus related residential buildings
 - Waste-Tech (11.5 ha) – Old quarries that were land filled by means of refuse

One strategic site has been included in the overall bulk calculations and design proposals although the owner is not currently a member of the partnership. The site is:

- ♦ The vacant Johnnic property (1.29 ha)

The total erf area of the land parcels under investigation is 182,18 ha. Some of the ERV Partners also own other properties in the immediate surroundings. The focus of this study however is on the nearly 22 ha or 10% of land which is located beyond property boundaries. Before analysing the public environment, the study addresses the contextual issues as well as planning and development forces which have impacted on the ERV.

3.0 LOCATIONAL CONTEXT

3.1 Metropolitan Context

The ERV is centrally located within the CMA and enjoys good regional accessibility from both within the CMA as well as the broader metropolitan functional region. It falls within the area of jurisdiction of the Tygerberg Municipality (Figure 5).

The study area is located approximately 18km east of the Cape Town CBD and 10km north of the Cape Town International Airport.

3.2 Tygerberg Municipal Area

The City of Tygerberg covers a geographical area of 421,79 km² and is home to approximately one million people. It extends from the rural areas to the north of Durbanville, to Khayelitsha and the False Bay coast in the south. Cape Town International Airport is located within the City of Tygerberg jurisdictional area. The total north-south distance is approximately 50 km (Figure 6).

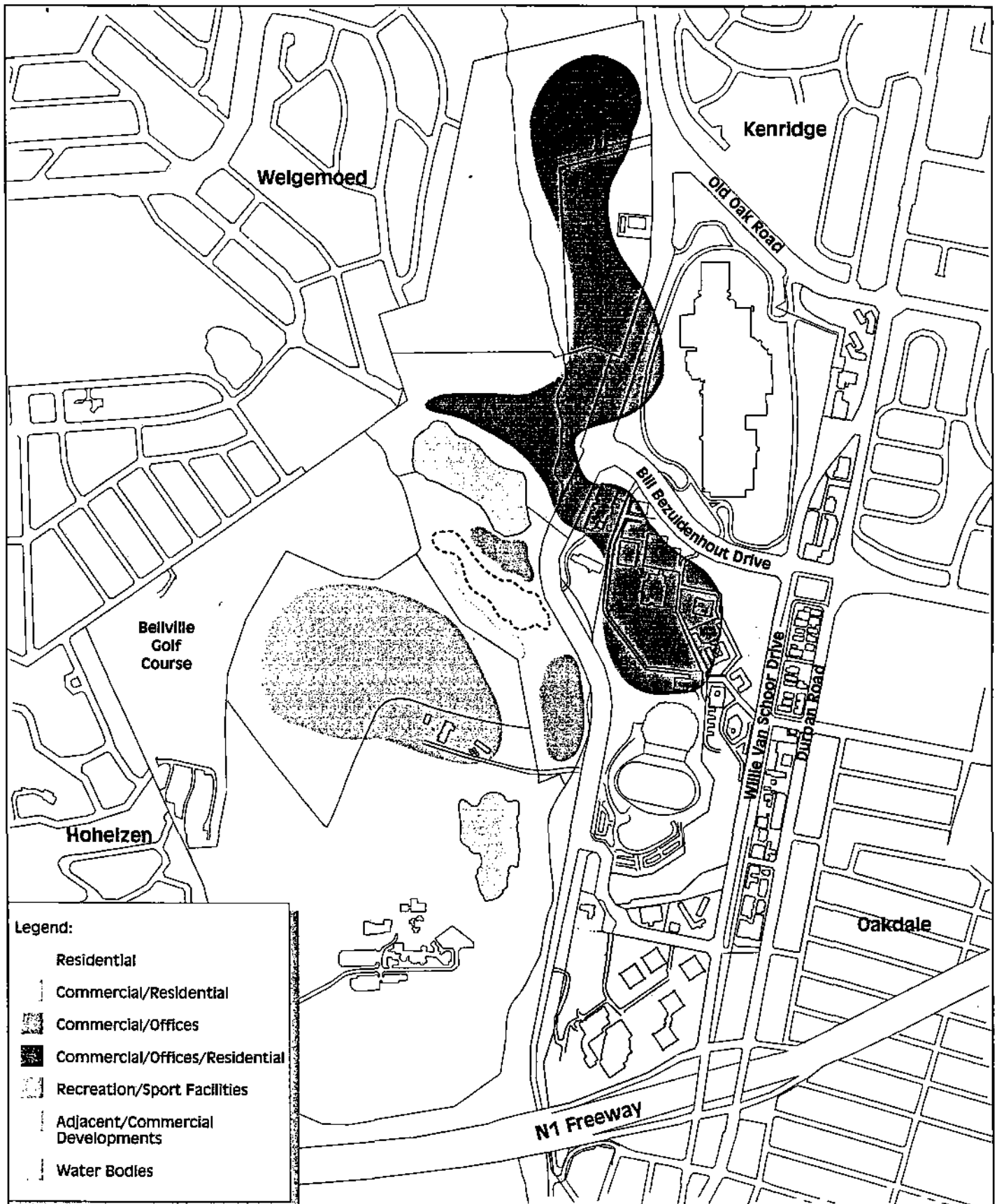
Tygerberg is divided into six service areas of which the East and North Areas are the most important in relation to the study area. The East Area, within which the ERV is located, has roughly the same boundary as the old Bellville Municipality. The East Area includes the Bellville CBD as its main urban centre and has a population of approximately 120 000 people.

The urban development of North Area that mainly consists of farmlands, is focussed around the Durbanville CBD. This impacts on the study area, because the Durbanville CBD and surroundings have limited direct links with the urban areas in the CMA other than along Durban Road. The impact of external traffic on the ERV is therefore an important consideration. The North Area has a population of 45 000 people.

3.3 Local Context

The ERV is located within a local area that is mainly characterised by well-established, low-density residential areas (Figure 7). The surrounding residential areas such as Hoheizen, Welgemoed and Protea Valley to the west, Kenridge and Eversdal to the north, Ridgeworth, Oakdale and Stellenberg to the east, and Boston to the south, comprise a combination of middle and higher income areas. Areas such as Oakdale and Ridgeworth as well as the lower parts of Kenridge are under pressure from commercial creep as the success of the ERV encourages new development proposals in the residential areas immediately adjacent to the commercial development.

The ERV is also located in close proximity to the Bellville CBD and the Bellville station to the south. Both the CBD and station are within 3 km from the Valley and the City of Tygerberg is looking at means of creating improved physical links between the two areas.



4.0 PLANNING CONTEXT

Planning and development in the ERV does not happen in isolation, but takes place within both a broader regional and sub-regional context. It is therefore important that these broader planning approaches are understood and taken into consideration.

4.1 Metropolitan Spatial Development Framework (MSDF)

The MSDF is aimed at guiding the form and location of physical development at metropolitan level. It provides a spatial framework for the development of the CMA as based on a 20-year vision of a well managed and integrated metropolitan area.

The MSDF supports intensified urban development within the existing urban areas, mainly along the proposed framework of metropolitan activity corridors and urban nodes. It addresses the imbalances of the past and provides for future growth, while protecting the special character of the region. The MSDF also proposes a denser urban structure to accommodate future population growth and urban development. To achieve these and other objectives, four spatial elements have been identified. These elements, namely the urban edge, metropolitan nodes, activity corridors and the metropolitan open space system (MOSS), as relevant to the Tygerberg context, are briefly discussed in the following subsections. Figure 8 illustrates the spatial proposals.

4.1.1 The Urban Edge

The urban edge demarcates the outer limit of urban development for the next 20 years. It protects the valuable natural resources such as the Durbanville farmlands and Tygerberg Hills, which are both within close proximity to the ERV, from urban sprawl.

4.1.2 Metropolitan Nodes

Metropolitan nodes are places of high accessibility and economic advantage where mutually reinforcing higher-order activities and land uses tend to locate. The Bellville CBD has been identified as such a node, the location and scale of which impacts on the metropole as a whole. This node is well developed and contains a mix of uses. It also holds potential for higher density residential development.

4.1.3 Activity Corridors

Activity corridors are linear axes of higher density mixed use development that link nodes. A strong relationship exists between the transport route and the surrounding land uses. Durban Road, which links Bellville with Durbanville and forms the eastern border of the ERV, has been designated as an activity corridor. It has already evolved into a strong development axis and has the potential to increase in importance within the Tygerberg context.

The other activity corridors that impact the development of the Tygerberg are Voortrekker Road between Bellville and Cape Town, Old Paarl Road which links Bellville with Brackenfell and Kraaifontein, a proposed North-south corridor which links Bellville to Cape Town International Airport and the proposed Philippi East node, and finally Bonga Drive which links Khayelitsha to Philippi East and the Airport.

4.1.4 Metropolitan Open Space System (MOSS)

The MOSS is a linked system of open spaces, which forms the green framework of the metropolitan area. It provides for recreation, resource conservation and other purposes in close proximity to the urban areas. The Tygerberg Nature Reserve, Elsieskraal and Kuils Rivers, the Driftsands Nature Reserve and various natural areas along the False Bay coast including the adjacent recreational facilities, are the major elements of the MOSS in the Tygerberg.

4.2 Tygerberg Spatial Development Framework (TSDF)

The City of Tygerberg has embarked on a spatial planning initiative known as the TSDF, to identify and implement the spatial proposals of the MSDF at local level and to create a spatially coherent, integrated and efficient urban fabric that is supportive to economic growth. The proposals of the TSDF are highlighted in Figure 9.

4.2.1 Growth and Investment Focus Areas

The ERV and Cape Town International Airport have been identified as the two biggest development opportunities in the Tygerberg. The ERV is an important commercial and financial centre with a strong tourism focus and will be a vital income generating area to support the development of other less developed areas.

The Airport has been identified as the future industrial and manufacturing focus and a key area for job and wealth creation in the Tygerberg. Approximately 650 ha of land will become available with the implementation of the 15-year development plan for extension and redevelopment of the airport. This land will satisfy more than 50% of the projected industrial land needs of the Tygerberg. The current and projected growth in the number of international flights as well as the vision of Cape Town becoming an important tourism hub between South-East Asia and South America creates opportunities for tourism and entertainment development. The challenge, therefore, is to improve existing and create new links between the airport and the ERV in order to allow for beneficial relationships between the areas.

Other designated focus areas include the Bellville CBD which, as the heartland of the Tygerberg, has been earmarked for revitalisation and southward expansion, the Durbanville CBD which forms the northern investment area, and the Khayelitsha CBD which forms the southern investment area.

4.2.2 Recreational Focus Areas

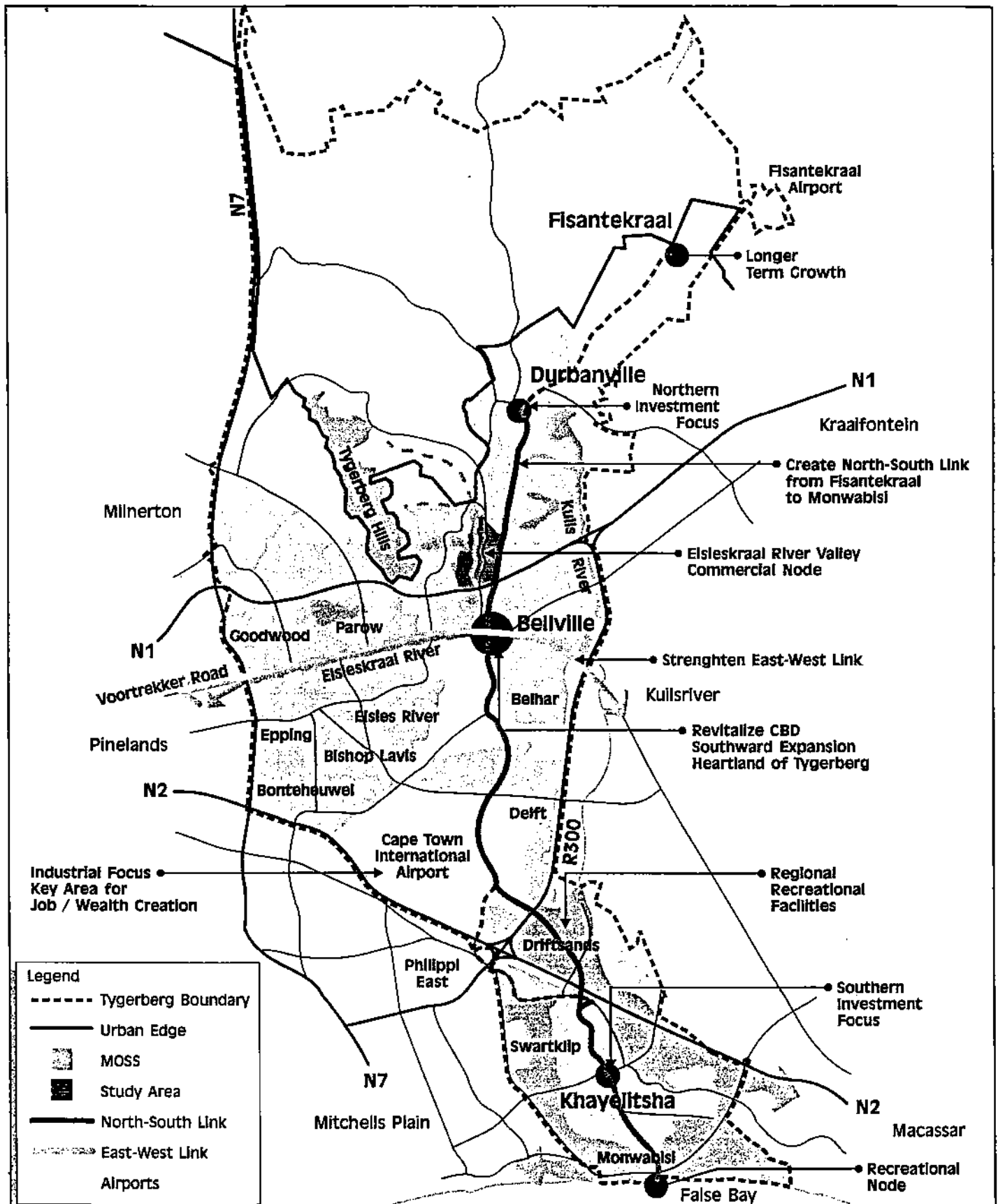
To address the needs of the broad range of people living in the Tygerberg, important recreational nodes have been identified that require preservation and appropriate development. The Tygerberg Hills are an important natural feature that give a sense of place to the Tygerberg, while the Elsieskraal and Kuils Rivers provide active recreational opportunities. Driftsands and Monwabisi have been identified by the TSDF as potential regional and local recreational nodes, which are located in close proximity to the majority of inhabitants in the Tygerberg.

4.2.3 Linking the Focus Areas

Strong north-south links are important for the growth and development of the Tygerberg. The main north-south spine, which expands on the activity corridor proposals of the MSDF, will form a continuous 50 km link between Fisantekraal in the north, which has been identified as the long-term growth area of the Tygerberg, and the Monwabisi recreational node on the coast.

The north-south spine will link approximately 1000 ha of developed and developable commercial and industrial land which includes areas such as the Durbanville CBD, the ERV, the Bellville node, the Airport, Driftsands and the Khayelitsha CBD. The link proposal incorporates the Durban Road corridor and will therefore impact on the functioning of the ERV because of the increased regional importance of Durban Road.

The east-west links in the Tygerberg, of which Voortrekker Road is the dominant connector, will also be strengthened.



4.3 Policy Plan for the Tyger Valley Area (1995)

The Town Planning Department of the Bellville Municipality compiled a policy document in 1995 to determine the development potential of vacant land within the vicinity of Carl Cronje Drive (then known as Hume Road) and the Tyger Valley Centre.

It was aimed at setting out guidelines to guide future development within the Valley. Whereas this plan has never been formally adopted, it nevertheless guided Council policy towards the area for some time.

The policy framework, as it was called, was premised on a vision of a mixed-use urban area (commercial, especially retail, residential, recreation uses and academic uses) which is at the same time both convenient and continually exciting to the individual. It stated that the natural and man-made characteristics of the area should be exploited to their full potential, in order to achieve the optimal use of the land for the benefit of both the users and landowners/developers.

The policy framework addressed issues such as possible future land-uses, accessibility, the impact of traffic, parking, building heights, public open spaces and landscaping. Of particular relevance is the emphasis on the need for pedestrian access in the area and the importance of creating a linked yet varied open space system that follows the Elsieskraal River stormwater and open space system.

With regard to building heights, the plan proposed that buildings of up to 6 storeys should be allowed on Carl Cronje Drive, but that the height should decrease along the ridge to the west and at the interface with existing residential areas. The framework emphasised the importance of considering the impact of buildings on the natural horizon when developing the higher areas. The framework also stated that building heights and horizontal dimensions should be varied in the low-lying areas.

The policy framework included detailed proposals on the future development of various land parcels in the study area, mainly the areas to the west of Carl Cronje Drive. Figure 10 illustrates the land use proposals envisaged for these areas.

The key components of the planning context, and more specifically the TSDF, have been adopted by the study team and used for informing the vision of the ERV.

5.0 DEVELOPMENT INFORMANTS

The broader environment within which the ERV exists contains various development informants that have influenced existing development and development proposals in the ERV. This section highlights the important physical, transport and economic considerations that inform development decisions.

5.1 Physical Environment

The Elsieskraal River Valley offers a unique physical environment that consists of both natural and man-made features. The River and the Tygerberg Hills form the most important components of the sub-regional open space network (Figure 11).

The Elsieskraal River is a major north-south structuring element, and together with the strong ridgelines creates a physical feature that has enhanced the economic and visual value of developments in the area. The escarpments include amphitheatres around the water-filled quarries and low-lying areas in the Valley. Figure 12 shows the important natural informants in the ERV conceptually. These features are discussed in more detail in the following sub-sections.

5.1.1 Elsieskraal River System

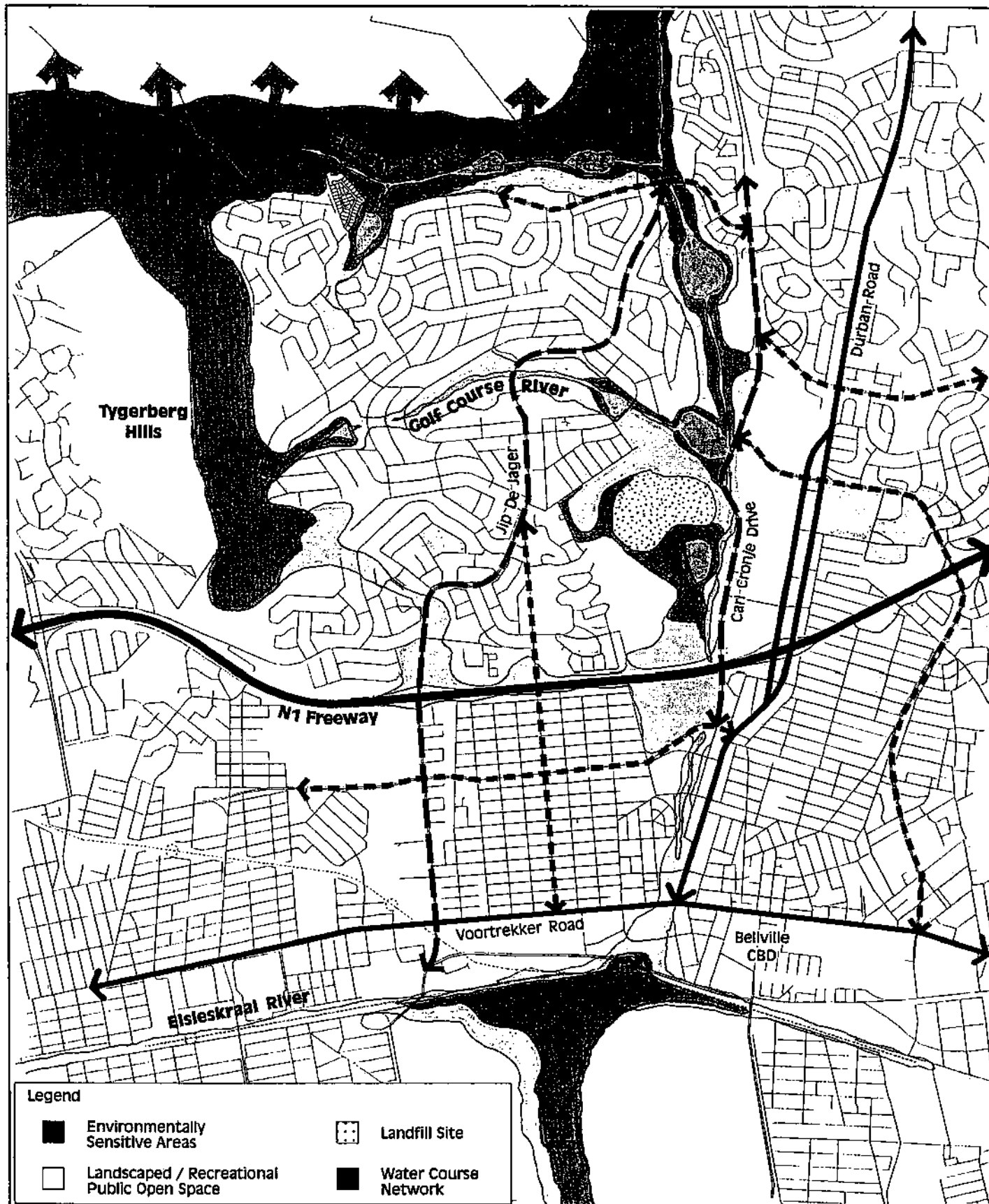
The Elsieskraal River rises in the Tygerberg Hills and flows east along Van Riebeeckshof Road before turning south immediately upstream of the Doordekraal Dam, and flowing through the study area to the Bellville CBD. From the Bellville CBD the river flows west towards Pinelands where it feeds the Black River. The river and its banks provide the opportunity to create a pedestrian link from the Tygerberg Hills to the Bellville CBD.

The natural state of the watercourse has already been altered by the Carl Cronje Drive alignment and developments in the area as well as the role of the river as the major stormwater system in the area. The river therefore changes in nature as it flows through the study area. Appendix A gives a synopsis of the current information that is available on the role of the river system in stormwater management.

The Doordekraal Dam to the north of the ERV was created as a recreational facility and has attracted abundant bird life. Immediately downstream from the dam, on the Propnet land, the river is in its most pristine condition and forms a series of pools. The most prominent areas of vegetation are found along the natural parts of the river. As the river crosses into the Monex Waterfront property a temporary diversion channel pipes the river past the northern quarry. The low flow water has been diverted from the northern quarry in order to improve the water quality of this water body. This quarry has a varying depth of between 5m and 15m.

A subsidiary stream that also rises in the Tygerberg Hills and drains the Bellville Golf Course flows over a waterfall before entering into the northern quarry. The water quality of this river is typified by nutrient enrichment, elevated turbidity and the abundance of floating and planktonic algae which has impacted on the water quality of the northern quarry.

South of the northern quarry the Elsieskraal River crosses to the east of Carl Cronje Drive via a culvert and remains on this side in an overgrown river course. After recrossing Carl Cronje Drive the river flows adjacent to the road before discharging into the Bellvillepark Detention Pond which is between 80 – 100m deep and plays an important part in the flood management of the river. Low flows are however diverted around the side of the quarry by means of a bypass pipe. The water from both the bypass pipe and the detention dam is discharged back into the river further south before the river flows under the N1 freeway.



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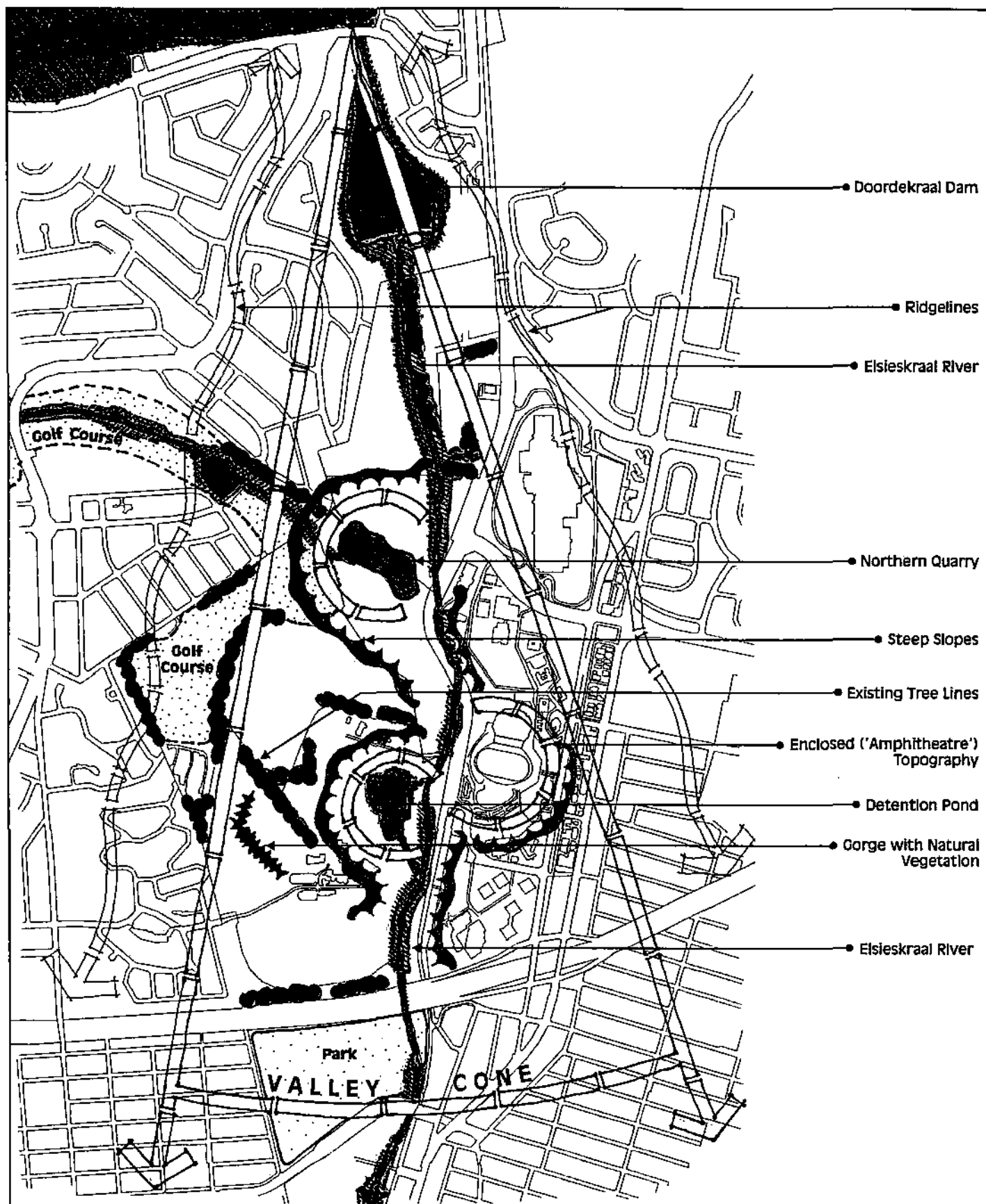
ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

Sub-Regional Open Space System



N.T.S

Figure 11



THE WATERFRONT TEAM

ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

Natural Features of the Valley



N.T.S

Figure 12

5.1.2 Topography

The study area contains strong ridgelines on either side of the river valley cone that opens up towards the south. A distinctive feature of the ERV is the prominent escarpment and enclosed amphitheatre topography. The escarpment on the western border of the study area is the most prominent and reaches a height of nearly 65m at its highest point. Two amphitheatres around the water filled quarries strengthen the visual prominence of the ridgeline.

Rodents and bird species such as raptors find shelter along the escarpment. The eastern ridge, although not as prominent as the western ridge, also forms an amphitheatre around the water-filled area next to the Athletics Track. Figure 13 is a diagrammatic section of the valley.

A gorge on the University of Stellenbosch land contains indigenous vegetation of conservation value. Several tree lines also form prominent features in the study area.

The valley and ridgelines allows for prominent views and vistas throughout the study area (Figure 14). It is important that these views and vistas are taken into account when building heights are considered and when public facilities, such as pedestrian bridges are designed. The ERV also contains prominent sites at the entrances to the study area, which could be used to create a sense of place.

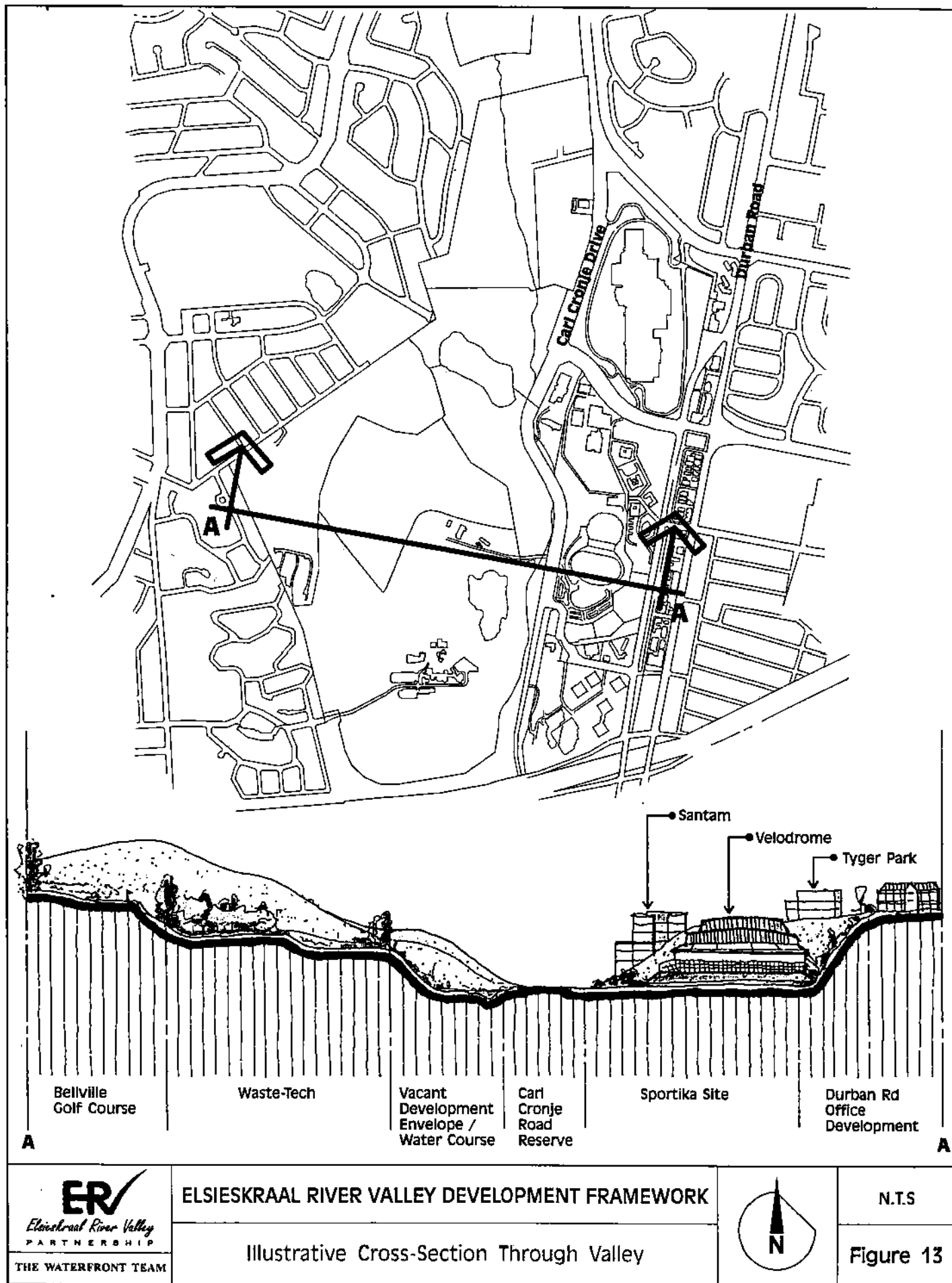
5.2 Sub-regional Transport Network and Access

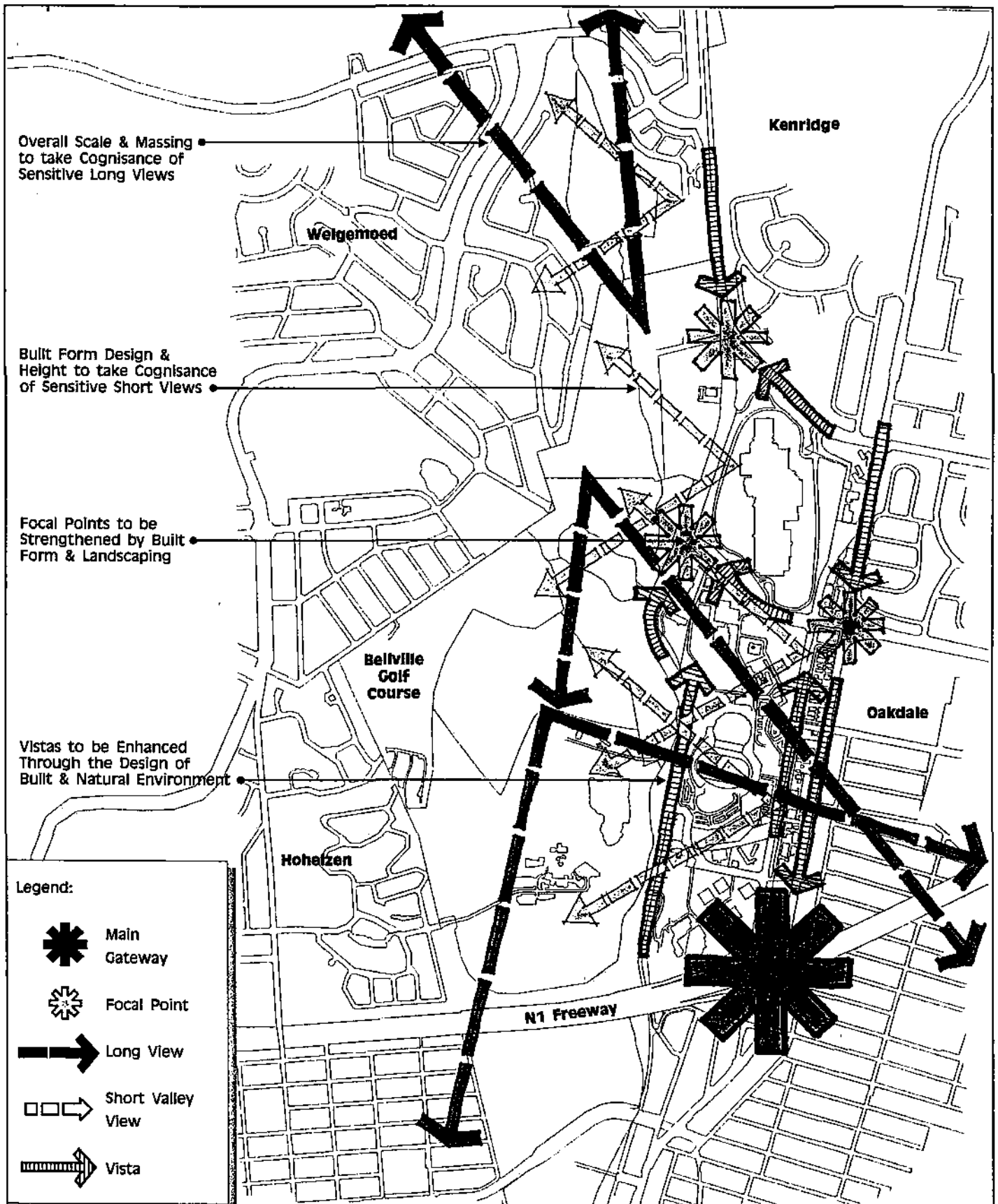
The ERV enjoys good access, as it is well located in terms of the overall sub-regional transport network (Figure 15). The N1 and R300 freeways provide good regional connectivity and accessibility to developments in the ERV. Apart from being located on the Durban Road activity corridor, the study area is also located in close proximity to Voortrekker and Old Paarl Road activity corridors. The Durban Road corridor provides the link between the Voortrekker Road corridor and the study area and is also the main access road to the Durbanville CBD and surroundings. The northward extension of the R300 to Durbanville could have a major impact on the ERV, because it will provide a bypass route from the Durbanville CBD. The construction of this road could therefore in future become important to the success of the ERV because it will ease the through traffic in the Valley.

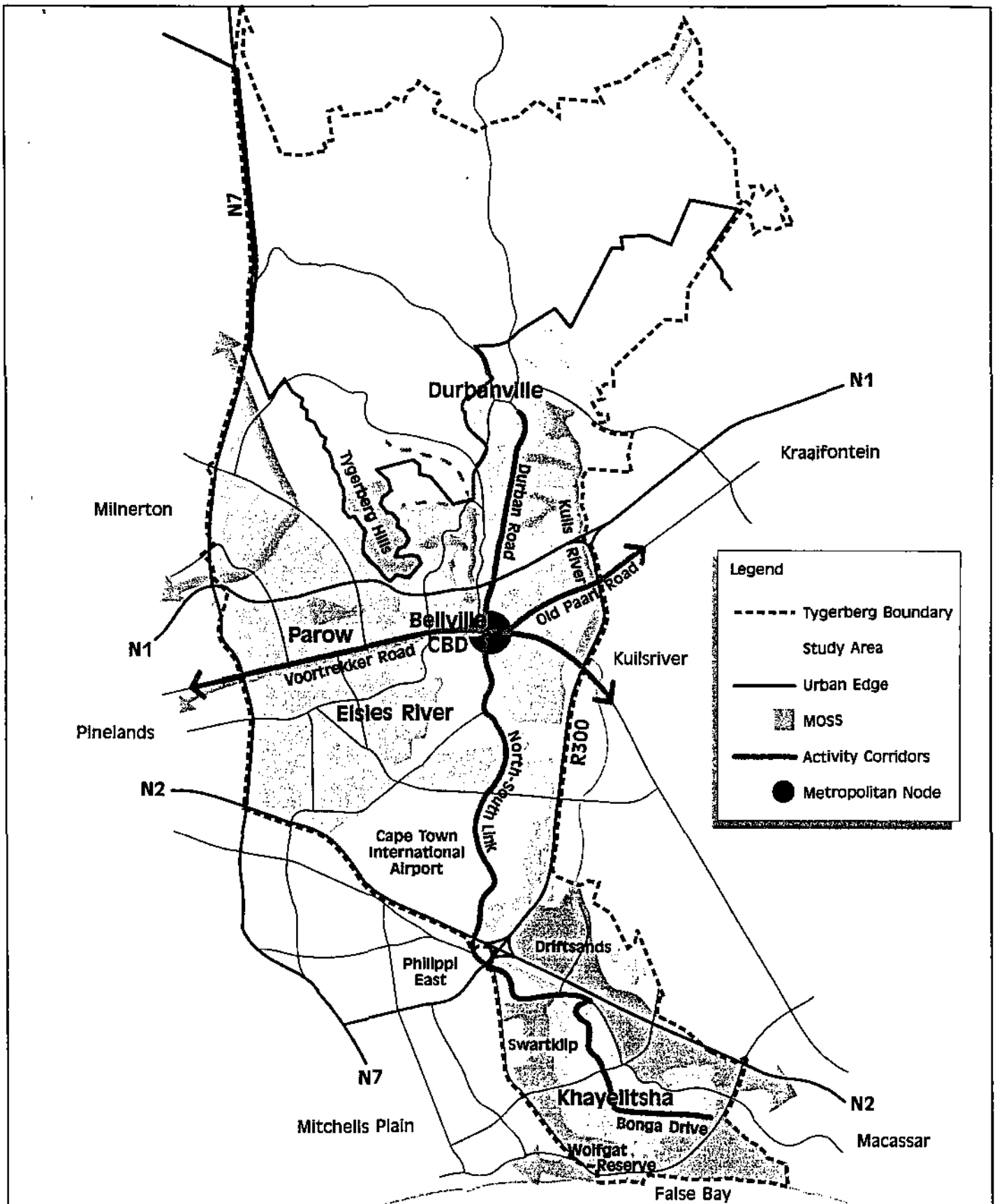
Various regional and district distributors connect the ERV with the surrounding residential and other development areas. Carl Cronje Drive and Jip de Jager Drives are the most important north-south distributor roads. Frans Conradie Drive to the south of the N1 freeway functions as a bypass route to Voortrekker road and has a mobility function. Hendrik Verwoerd Drive to the north of the N1 freeway has been planned for the same purpose as Frans Conradie Drive, but changes in its alignment have resulted in a lower level of accessibility, especially to the east of the Jip de Jager intersection. The future eastward extension of this road to link up with Carl Cronje Drive could improve access to the ERV.

Van Riebeeckshof Road, Bill Bezuidenhout Drive and Old Oak Road also provide access to the ERV from the surrounding residential and commercial areas. Bill Bezuidenhout Drive could become a major north-south distributor once it is extended southwards to link up with the Tienie Meyer Bypass Road.

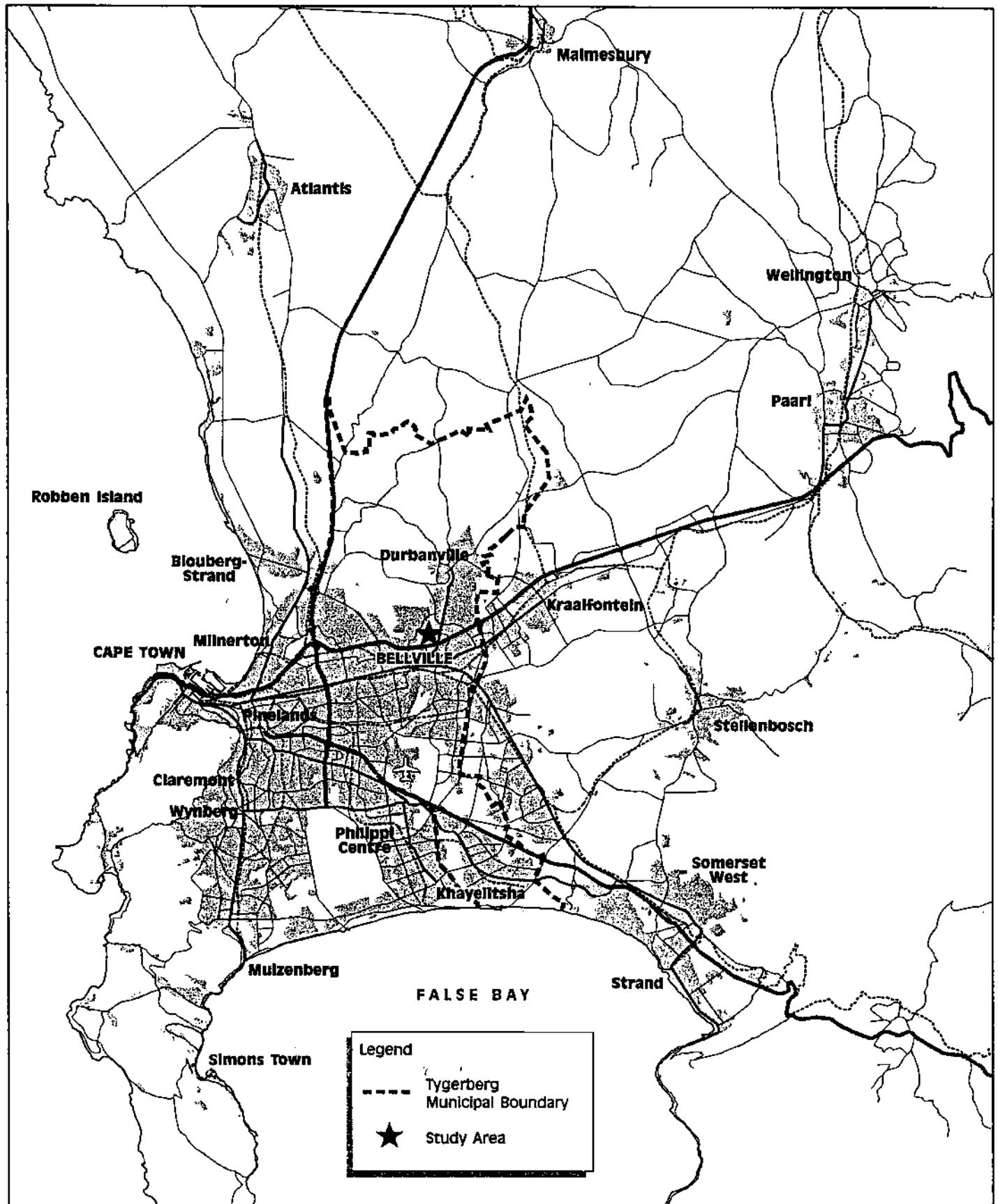
Neither Carl Cronje Drive, nor the Durban Road Corridor has distinctive activity or mobility functions. Durban Road is regarded as an important regional distributor although the two-way couplet to the east of the study area has major activity along its length. Although it provides important access to these developments, it allows for high speeds because the developments do not relate directly to the road, but are accessed via service roads. Carl Cronje Drive on the other hand is viewed to have a local distributor function, but the proposed development in the study area and the number of intersections that have been approved will slow traffic down and create more of an activity function for the road. The development will not, however, relate to the road itself.



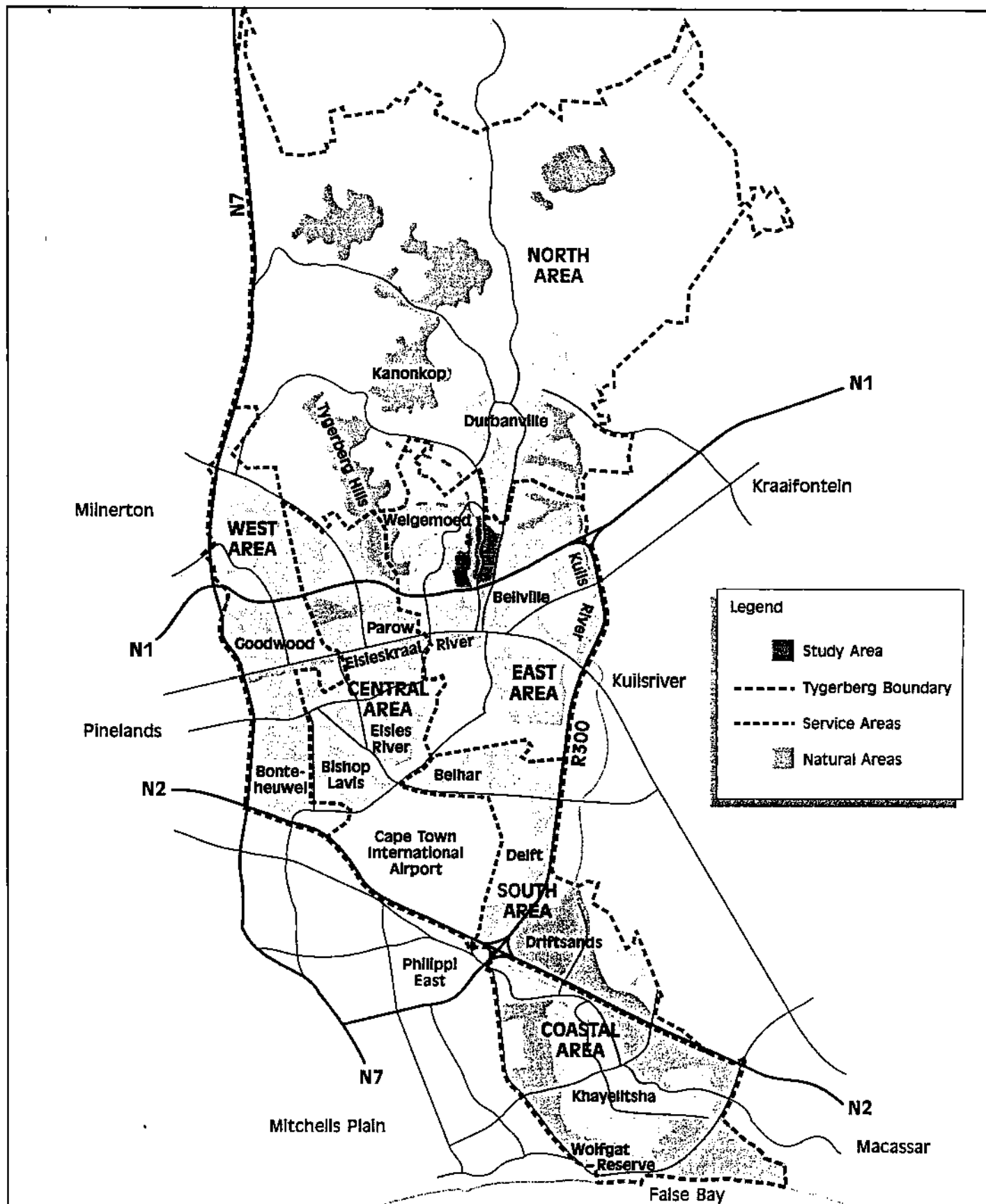




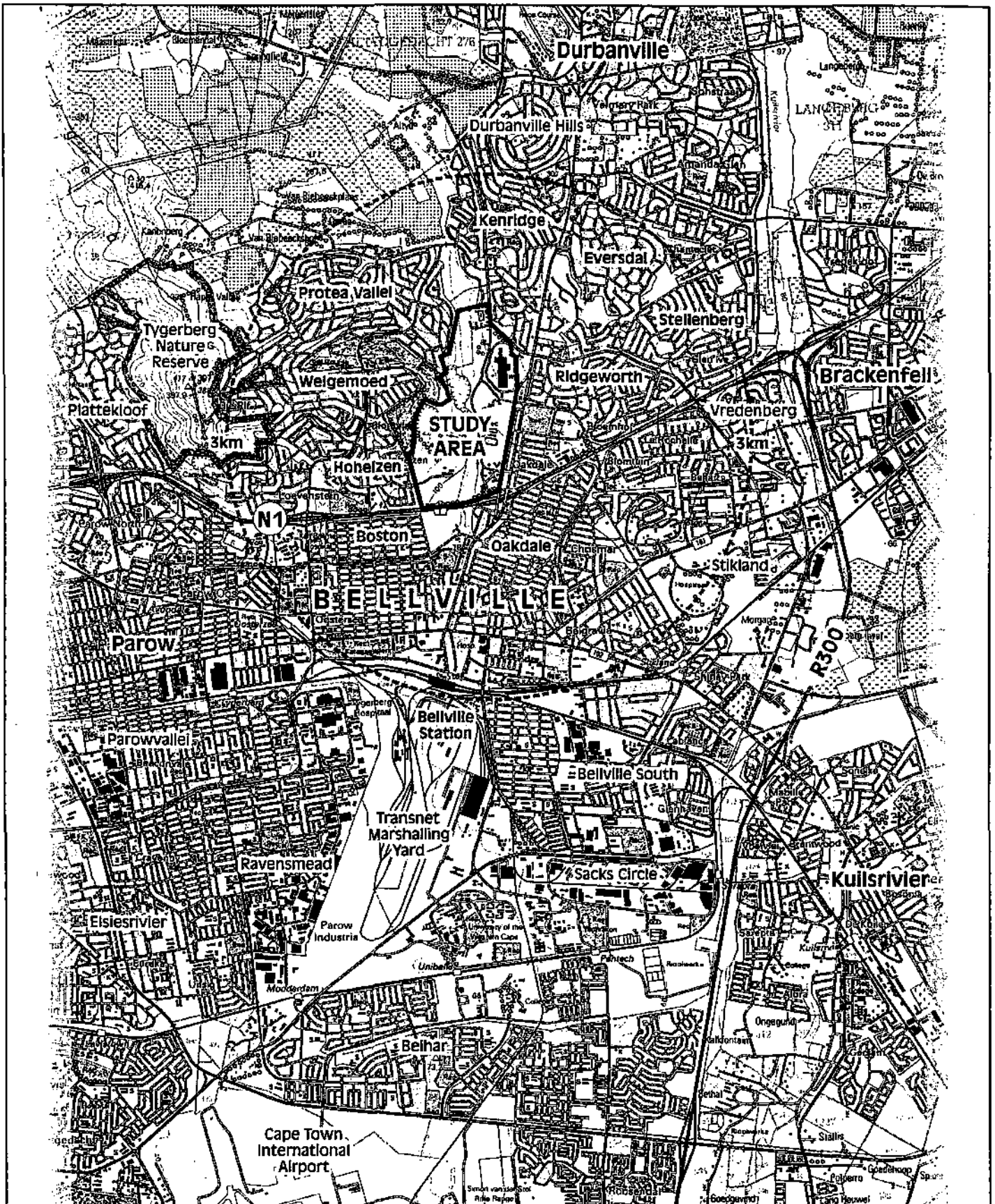
 THE WATERFRONT TEAM	ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK MSDF Proposals		N.T.S Figure 8
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 THE WATERFRONT TEAM	ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK Metropolitan Context		N.T.S Figure 5
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 THE WATERFRONT TEAM	ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK Tygerberg Municipal Area		N.T.S Figure 6
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 ER Elsieksraal River Valley PARTNERSHIP THE WATERFRONT TEAM	ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK Local Context		N.T.S Figure 7
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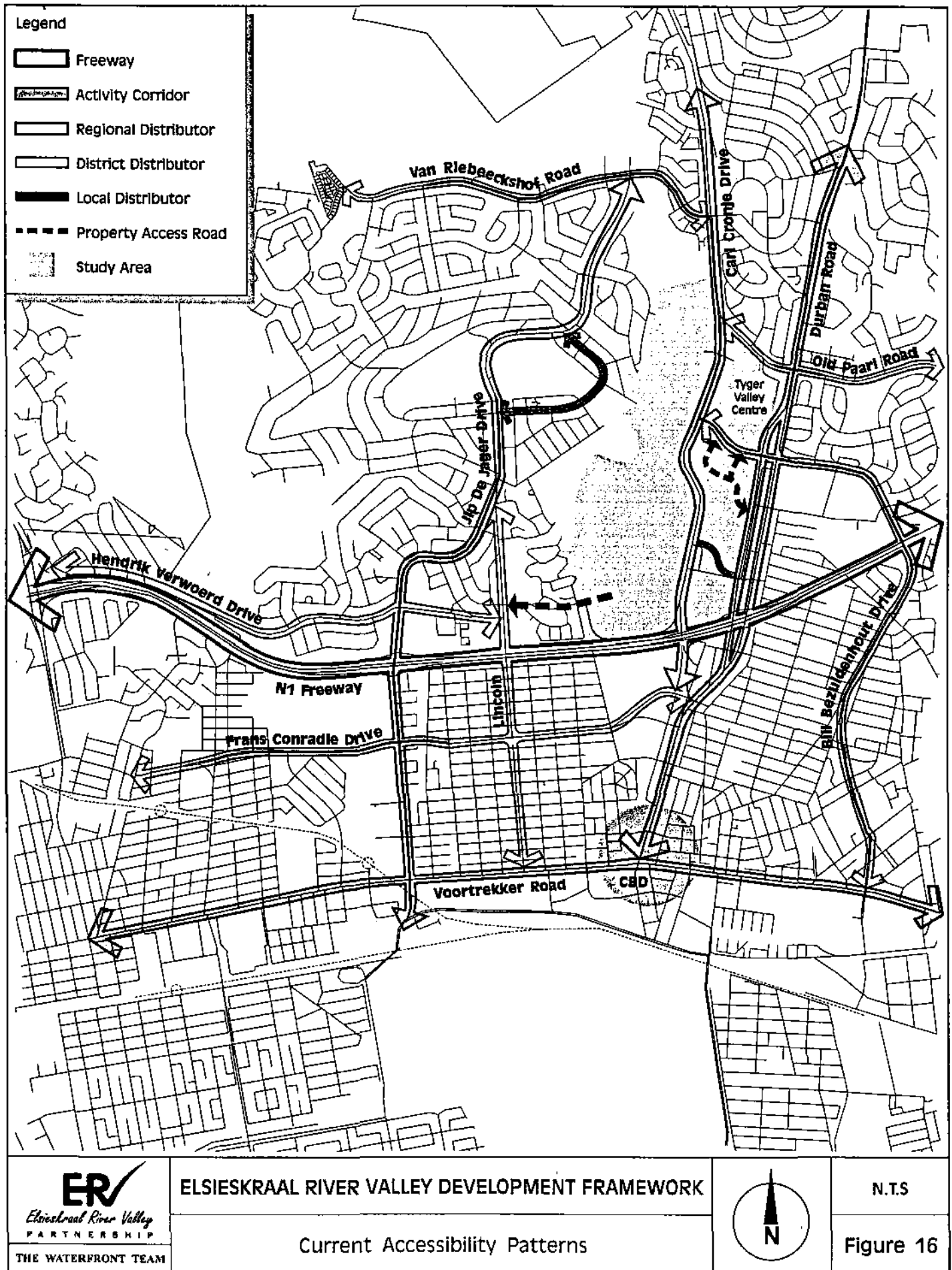
The current accessibility patterns in the sub-region are illustrated in Figure 16. Improvements to the road network, including the link road across the University of Stellenbosch land as well as the possibility of a half-diamond interchange between Carl Cronje Drive and the N1 Freeway, provide opportunities to improve access to the ERV. A further road improvement that will improve access to the study area is the proposed realignment of Durban Road.

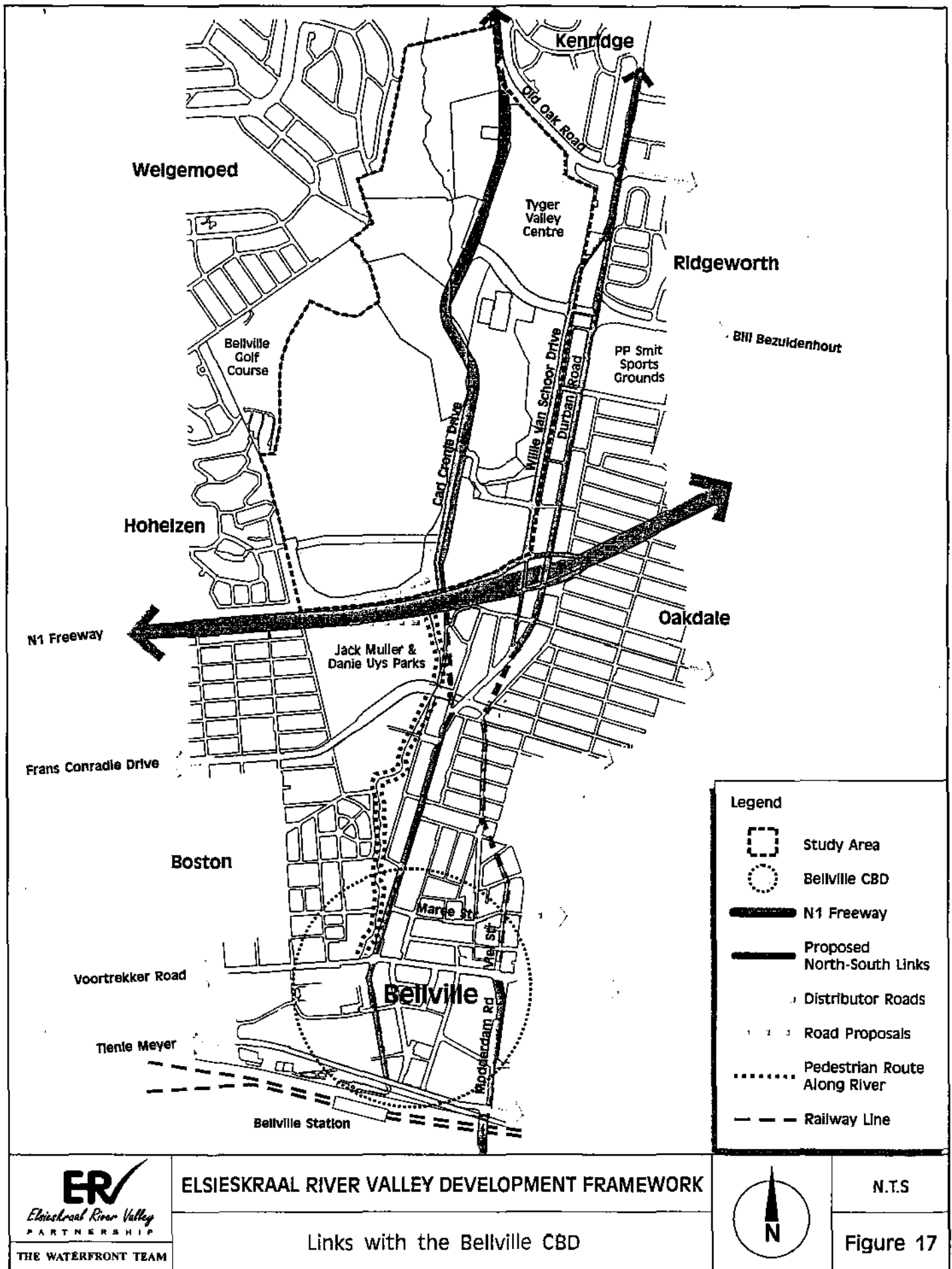
To improve links between the Bellville CBD and the ERV, and to improve current accessibility within the Tygerberg, the realignment of Durban Road south of the N1 Freeway is being considered (Figure 17). The new alignment will link Carl Cronje Drive with the southern section of Durban Road. The widening of the culvert bridge under N1 will be important for this purpose. The possibility also exists to link this road to the Tienie Meyer Bypass.

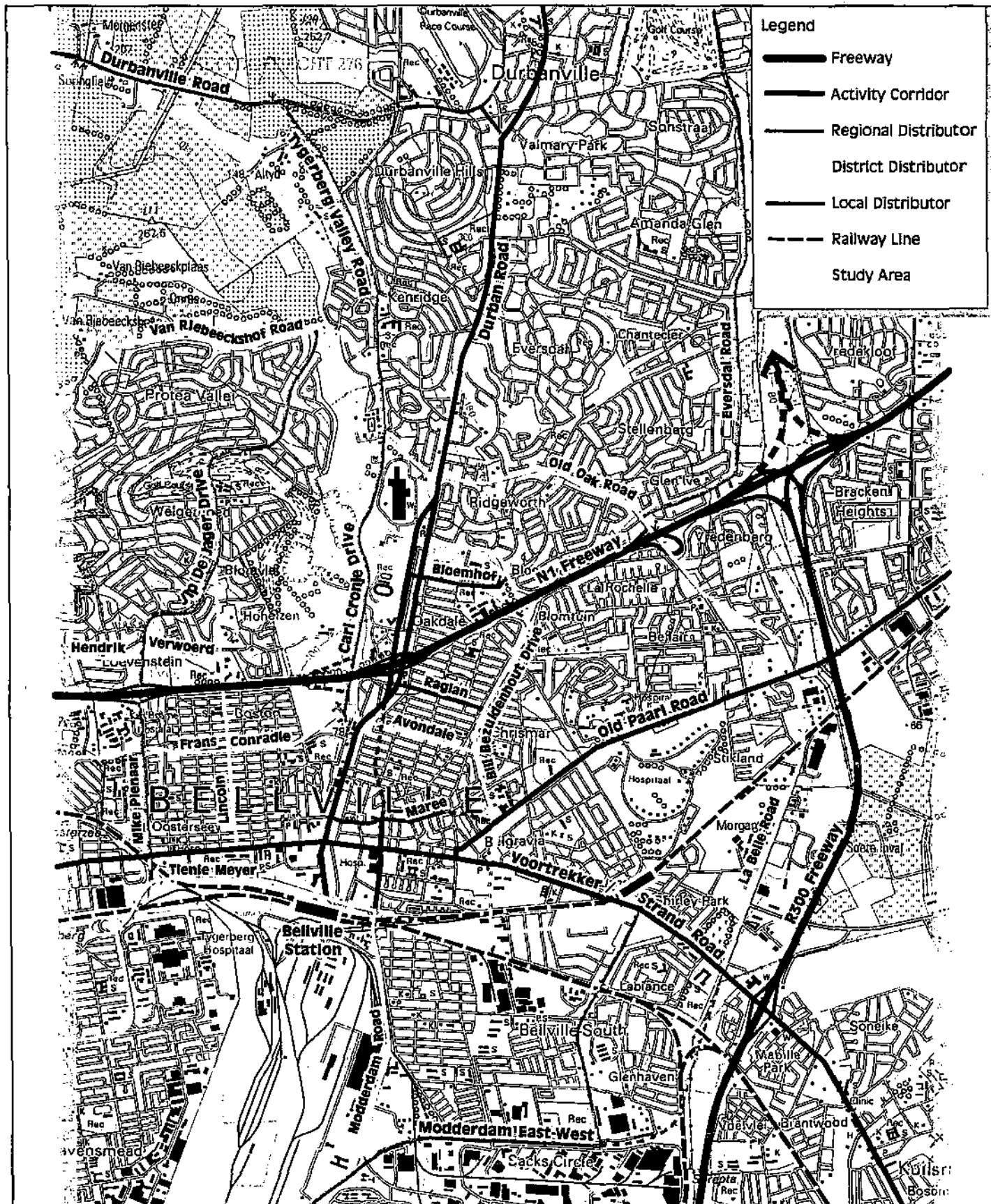
The northern portion of Durban Road will be realigned along an old rail reserve and Vlei Street to link up with Voortrekker Road at the Modderdam Road intersection. The proposed realignment will create a parallel two-way road system and the land in between will enjoy high accessibility and visibility.

The realignment will also improve access to the study area and support the success of the local and regional distributor functions of Carl Cronje Drive and the Durban Corridor.

The possibility also exists to create a road-based public transport system that will link the Bellville CBD and station to the ERV by means of a circular route along the new road alignments. The Bellville station is a converging point of several railway lines and is therefore the major transport interchange in the CMA. The improved access to the station will enable more employees and clients in the ERV to make use of public transport to reach their destinations. These road and transport proposals will increase the local as well as regional connectivity.







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Elsieksraal River Valley
PARTNERSHIP

THE WATERFRONT TEAM

ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

Sub-Regional Transport Network



N.T.S

Figure 15

5.3 Business Development in the Immediate Surroundings

The business development in the immediate surroundings of the ERV is mainly focussed on the Durban Road activity corridor (between the Mispel and Old Oak intersections, including Rosenpark) (Figure 18). The three substitution schemes implemented along the two-way couplet allowed higher density development with mainly office development on the upper floors of three to four storey buildings and with a variety of retail and other commercial activities at ground level. The success of this area encouraged other developments such as Rosenpark, which was planned as an office/light manufacturing area, the Corporate Place office development and the City Lodge Hotel, as well as new proposals such as the Delphi Arena and mixed-use O'Kennedyville developments. The Durban corridor and ERV currently enjoy the highest commercial land values in the Tygerberg.

Table 1 provides an analysis of the existing and possible development rights along the corridor (between the N1 Freeway and the Old Oak intersection, including Rosenpark) as well as other development rights in the area. The Durban Corridor has approved and possible development rights totalling to 112 084m² which translates into 95 271 m² GLA. Of the GLA rights 55% has been developed. The other developments in the immediate vicinity amount to 127 481 m² bulk or 108 359 m² GLA. Of this, 51%, has been utilised for the development rights for Durban Road corridor and surrounding area.

The ERV is also located in relative close proximity to the Bellville CBD and Durbanville CBD. Both these CBD areas have already enjoyed a wide range of commercial developments that serve large populations and both have further potential for development. The Durbanville CBD has approximately 120 000m² of developed and available bulk whereas the Bellville CBD is estimated to have 220 000m² developed and available bulk (This excludes commercial development along Voortrekker Road outside the CBD). The Bellville CBD has stagnated due to successful commercial developments such as the Tyger Valley Shopping Centre, but proposals are being considered to revitalise the CBD and to extend it southwards.

The proposed realignment of Durban Road and the encouragement of commercial development along this route will support the integration of the ERV and Bellville CBD and the strengthening of the central node. Each area will serve distinctive markets. This integration will be achieved through design and public transport links.

Before assessing details of the public environment within the ERV, the study addresses the private realm and its own impact on the public environment.

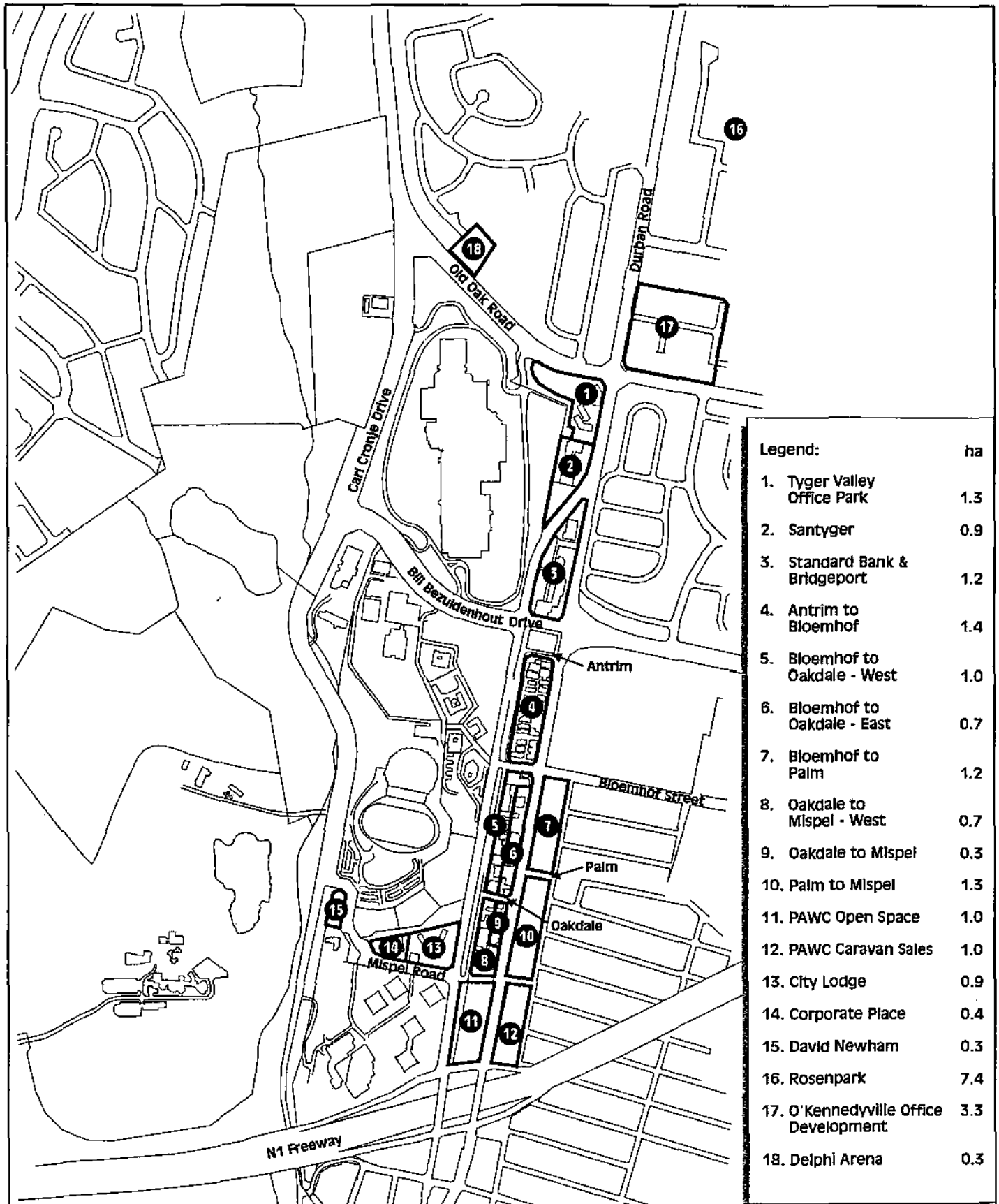


Table 1: Approved Rights Surrounding Developments

TABLE 1a : BULK DEVELOPMENT RIGHTS ALONG DURBAN ROAD: PARKING ANALYSIS

Property/ Owner Name	Parking ³ Required Ito GLA Rights	Parking Required Ito Utilised GLA	Existing Parking	Existing Shortfall/ Surplus ⁴	Future Parking ⁵	Total Parking on Site	Comments
Tyger Valley Office Park	327	174	168	-6	153	321	Vacant portion currently provides 72 bays
Santyger	225	225	275	50	0	275	Taken as fully developed
Std. Bank & Bridgeport	179	179	235	56	0	235	Mainly retail development
Btw. Antrim & Bloemhof	469	376	279	-97	93	372	Largely developed
Btw Bloemhof & Oakdale - west	658	304	167	-137	354	521	Largely developed - small portion of bulk used
Btw Bloemhof & Oakdale - east	460	89	86	-3	371	457	Largely developed - small portion of bulk used
Btw Bloemhof & Palm	481	85	85	0	396	481	Mainly residential - future development anticipated
Btw Oakdale & Mispel - west	395	395	198	-197	0	198	Taken as fully developed
Btw Oakdale & Mispel - east	98	41	38	-3	57	95	Current development included
Btw Palm & Mispel	518	217	217	0	301	518	Mainly residential - future development anticipated
PAWC: Open space							Currently used for informal parking
PAWC: Caravan sales							Caravan sales - no development anticipated
Sub-Total	3811	2085	1748	-337	1725	3473	

Additional # of on-street bays : 266

TABLE 1b : OTHER DEVELOPMENT BULK RIGHTS IN THE VALLEY: PARKING ANALYSIS

Property/ Owner Name	Parking ³ Required Ito GLA Rights	Parking Required Ito Utilised GLA	Existing Parking	Existing Shortfall/ Surplus ⁴	Future Parking ⁵	Total Parking on Site	Comments
City Lodge	158	60	55	-5	0	55	Total of 106 rooms
Corporate Place	192	188	120	-68	0	120	Office block - using Council land for parking
David Newham	86	0	0	0	86	86	Rights lapsed - probable future rights
Rosenpark Area	2519	1907	1907	0	613	2520	Office - light manufacturing combination
O'Kennedyville Office Development	1110	0	0		1110	1110	Mixed-use development proposed
Delphi Arena	111	0	0		111	111	Currently undeveloped
Sub-Total	4177	2156	2082	-74	1920	4002	
TOTAL	7988	4241	3830	-411	3645	7475	

3. Parking ratios calculated at 4 bays/100 m² GLA

4. On-street parking not included

5. Parking required if further development takes place

O: Office
B: Business
R: Residential
E: Education

Table 1: Approved Rights Surrounding Developments

TABLE 1a : BULK DEVELOPMENT RIGHTS ALONG DURBAN ROAD/WILLIE VAN SCHOOR CORRIDOR

Property/ Owner Name	Area	J&G Zone	Zoning	Total Erf Area (ha)	Average Bulk Factor Ratio ¹	Bulk Rights (m ²)	Utilised Bulk (m ²)	Available Bulk (m ²)	GLA Rights (m ²) ²	Utilised GLA (m ²)	Available GLA (m ²)
Tyger Valley Office Park	1	63	Secondary Business	1.2834	0.75	9621	5121	4500	8178	4353	3825
Santtyger	2	62	Secondary Business	0.8817	0.75	6807	6607	0	5816	5616	0
Std. Bank & Bridgeport	3	60	Secondary Business	1.2395	0.45	5254	5254	0	4466	4466	0
Btw. Antrim & Bloemhof	4	42	Office Park	1.3800	1.00	13800	11058	2742	11730	9399	2331
Btw Bloemhof & Oakdale - west	5	40	Secondary Business	0.9681	2.00	19362	8940	10422	16458	7599	8859
Btw Bloemhof & Oakdale - east	6	31	Secondary Business	0.6764	2.00	13528	2617	10911	11498	2224	9274
Btw Bloemhof & Palm	7	41	Sec Bus/Single Res	1.1800	1.20	14160	2514	11646	12036	2137	9899
Btw Oakdale & Mispel - west	8	73	Secondary Business	0.7315	1.60	11631	11631	0	9886	9886	0
Btw Oakdale & Mispel - east	9	38	Secondary Business	0.2881	1.00	2881	1204	1677	2449	1023	1425
Btw Palm & Mispel	10	39	Sec Bus/Single Res	1.2700	1.20	15240	6381	8859	12954	5424	7530
PAWC: Open space	11	32	Single Res	1.0672							
PAWC: Caravan sales	12	33	Single Res	1.2328							
Sub-Total				12.1987		112084	61327	50757	95271	52127	43143

TABLE 1b : OTHER DEVELOPMENT BULK RIGHTS IN THE VALLEY

Property/ Owner Name	Area	J&G Zone	Zoning	Total Erf Area (ha)	Average Bulk Factor Ratio ¹	Bulk Rights (m ²)	Utilised Bulk (m ²)	Available Bulk (m ²)	GLA Rights (m ²) ²	Utilised GLA (m ²)	Available GLA (m ²)
City Lodge	13	25	Secondary Business	0.9277	1.00	9277	3556	5721	7885	3023	4863
Corporate Place	14	24	Secondary Business	0.3768	1.50	5652	5544	108	4804	4712	92
David Newham	15	23	Undetermined	0.2543	1.00	2543	0	2543	2162	0	2162
Rosenpark Area	16	72	Sec Bus/Local Bus	7.4098	1.00	74098	56076	18022	62983	47665	15319
O'Kennedyville Office Development	17	70	Sec Bus/Office Park	3.2640	1.00	32640	0	32640	27744	0	27744
Delphi Arena	18	52	Office Park	0.3271	1.00	3271	0	3271	2780	0	2780
Sub-Total				12.5597		127481	65176	62305	108359	55399	52959
TOTAL				24.7584		239565	126503	113062	203630	107526	96103

1. An average for bulk rights was calculated per geographical area

2. GLA has been calculated at 85% of the total floor area where no information was available

O: Office
B: Business
R: Residential
E: Education

6.0 LAND USE & DEVELOPMENT PROPOSALS

This section gives a brief overview of the current zoning and land uses in the ERV as well as the current and proposed rights of the landowners.

6.1 Zoning

The landowners in the ERV and the surrounding properties have been afforded a variety of zonings as indicated in Figure 19. The dominant established zonings in the ERV are office park and secondary business. The University of Stellenbosch, including Waste-Tech, has an education zoning, while the Sportika land parcel is zoned for open space.

The undeveloped land parcels to the west of Carl Cronje Drive currently have subdivisional area zonings to allow for future designations as the mixed-use developments take place. The zoning of the Mini-Cape site, except for the sub-station, is undetermined.

6.2 Land Use

Figure 20 is a land use analysis of the ERV and its surroundings. The portion of the study area to the east of Carl Cronje Drive contains established office and commercial uses, with the Velodrome and Athletics Track forming a sporting/recreational node.

The portion to the west of Carl Cronje Drive, although having approved rights is still currently mainly undeveloped. The Waste-Tech site has become available for recreation, a portion of the Propnet site is being used for commercial purposes, and portions of Mini-Cape and the Bellvillepark Campus site are used for sport.

6.3 Approved Rights: Existing and Proposed Development

Table 2 provides an analysis of the existing and proposed developments according to the approved rights of the ERV Partners, including Santam and Johnnic. The table also contains an analysis of the parking and people numbers in terms of these rights. Figure 21 shows existing and proposed development.

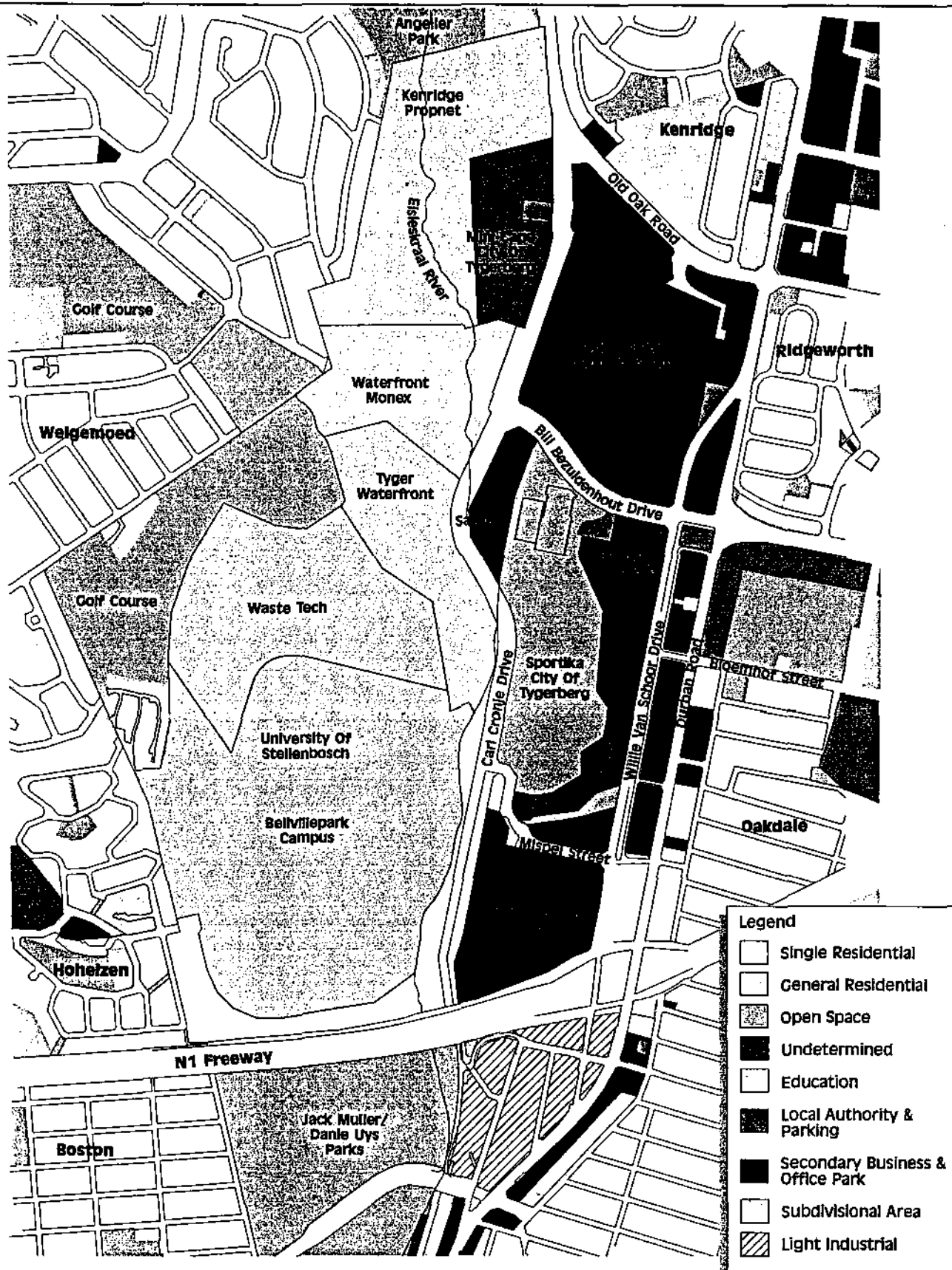
The ERV Partners (including Johnnic) currently have a total bulk or floor area of 606 153 m² that translates into a GLA figure of 565 782 m². Of the total GLA rights only 30% or 171 328 m² have been utilised. The existing number of formal parking bays provided in terms of the utilised GLA rights are 8 443 while an additional total number of 19 238 bays will be provided if all the current rights are taken up.

The following sub-sections summarise the existing development, current development proposals and potential development of the landowners in the ERV, in terms of their approved development rights.

6.3.1 Metropolitan Life (Areas 1 & 2 on Table 2, Figure 4)

Metlife has developed an office park in accordance with their rights. The development includes the Parc du Cap office park that consists of six office blocks (floor area of 44 842 m²), and the newly built Metlife Head Office (floor area of 12 000 m²). In addition, the old Commando building with a floor area of 1 704 m² has been redeveloped as a recreational facility for staff members. Metlife has the bulk rights (33 308 m²) to build a further three buildings, of which the first two buildings are planned within the next 18 months. A total of 2 588 parking bays will be provided on site. The embankment along Carl Cronje Drive is being extensively landscaped as part of the current head office development.

The property is accessed via two formal entrances off Mispel Road, of which the most western entrance will be closed once further development takes place. In addition, a new signalised access point from Carl Cronje Drive is being constructed. The recreational facility currently has a temporary access road from Mispel Road, but will eventually be accessed via the main entrances.



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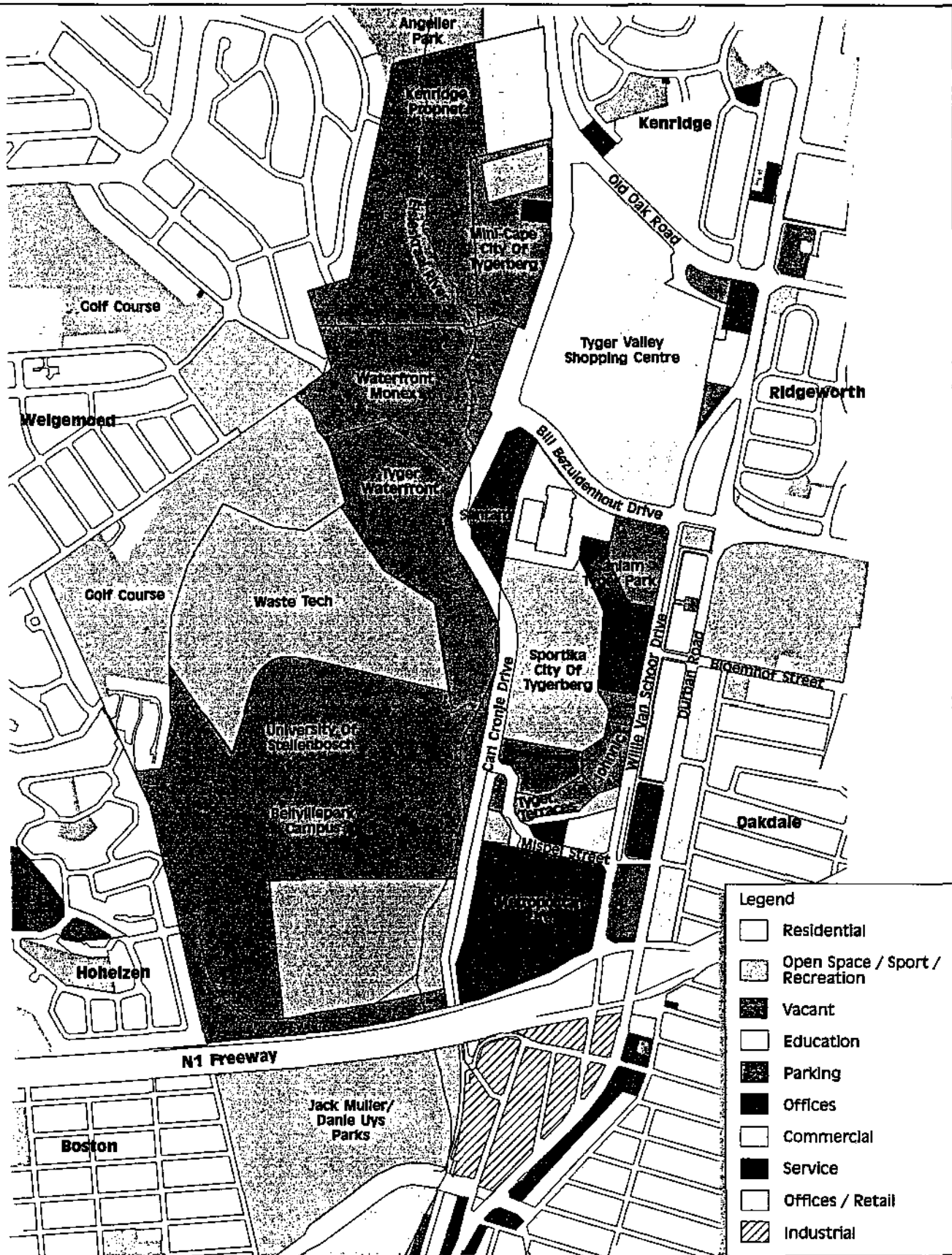
ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

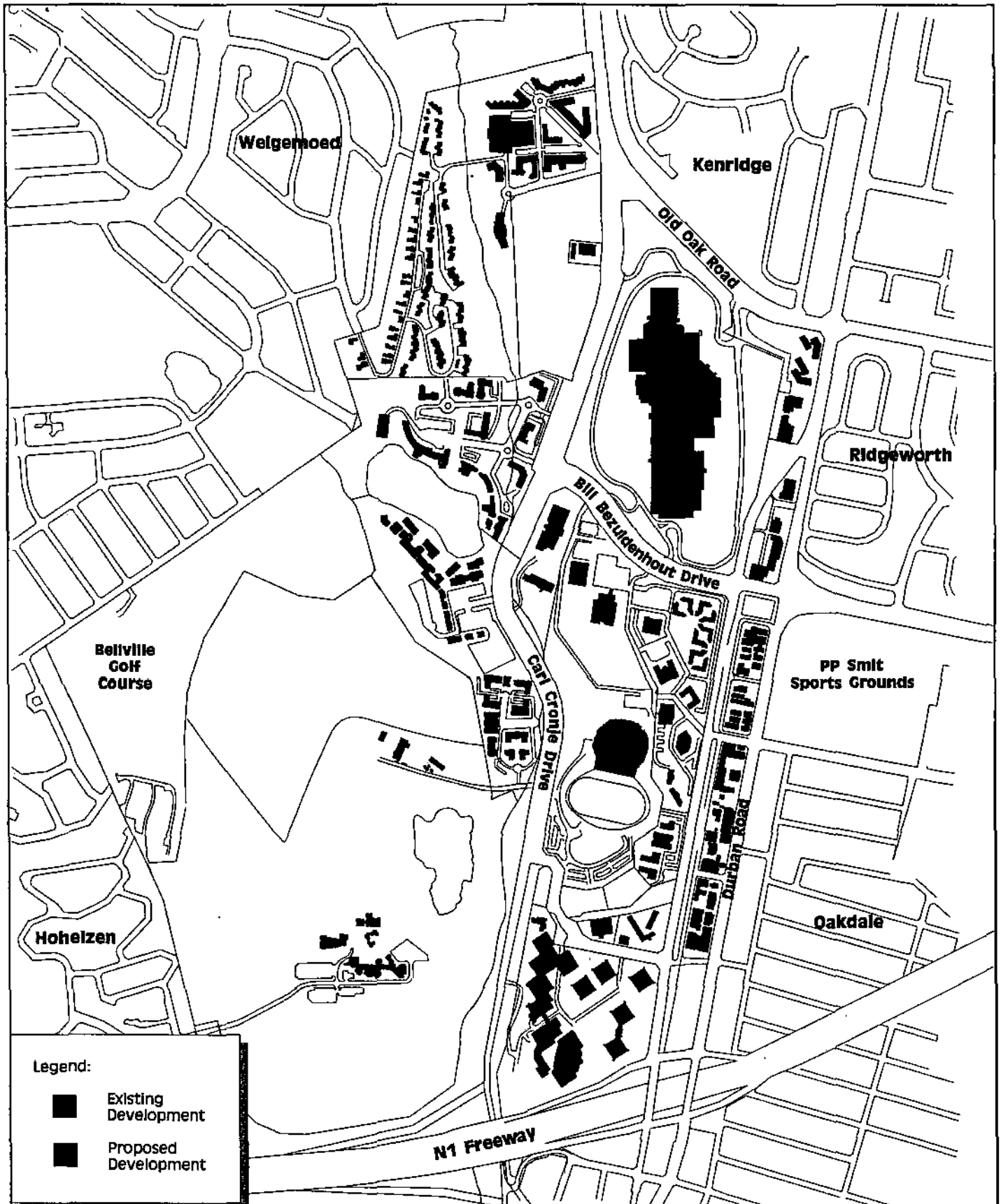
Zoning Plan



N.T.S

Figure 19





6.3.2 Tyger Terraces (Area 3)

The Tyger Terraces site is currently vacant, but will be developed mainly for office purposes with some commercial uses on Mispel Road. The total approved bulk rights for the site is 6 604 m². The building design and location will accommodate the steep slope. A total of 252 bays are required in terms of the approved rights.

The only vehicular access to property is from the parking area of the Bellville Athletics Stadium. A servitude of 7m has to be provided next to the existing parking area south of the Bellville Stadium for the purpose of access.

6.3.3 Johnnic (Area 4)

The current proposal for this site is a combined office and retail development that will include restaurants and a hotel (15 470 m² floor area). The development also has a parking garage stepped on seven levels to accommodate the slope. The water body on the lowest portion of the site, next to the Athletics Track, will be kept and created into a water feature.

The development will have a formal access point on Willie van Schoor Drive opposite Oakdale Street with acceleration and deceleration lanes. It will also have a left out exit further to the north.

6.3.4 Sanlam: Tijger Park (Area 5)

Sanlam has developed an office park in accordance with their rights. Four office buildings have been built and a fifth is under construction. The bulk utilised totals 20 000 m². Sanlam has a further 19 000 m² of bulk rights and plans on developing three buildings of which the first is proposed on the southern portion of the site. A mixed-use office and business development is also proposed next to the Willie van Schoor - Bill Bezuidenhout intersection. The business will include specialised retail as well as a public plaza with restaurants and other retail that will cater for the needs of the office staff in the area.

The existing office blocks have a combination of structured and surface parking (680 bays). The 714 parking bays required for the proposed developments will mainly be structured within the buildings. The property has a signalised access from Willie van Schoor Drive opposite Bloemhof Street. There is also an informal road link with the Velodrome road system, which allows access onto Bill Bezuidenhout Drive.

6.3.5 City of Tygerberg: Sportika (Area 6)

The main features of the Sportika property are the Bellville Athletics Stadium and the multi-purpose Velodrome. The northern portion of the property next to Bill Bezuidenhout Drive is used for business purposes. The three retail developments that are conducted under lease agreements amount to a floor area of 6 242 m². The Health and Racquet Club has a 40 year lease which started in 1988, the Sportsman's Warehouse has a 30 year lease which also started during the same period, and the Sports Bar has a 10 year lease which started at the end of 1990.

The Velodrome, as well as the parking area south of the Bellville Stadium, currently forms part of the Goodwood Casino proposal. These facilities will be leased to Sunwest for use as a Super Bowl type facility if the bid is successful.

The Sportika property has access points from Carl Cronje Drive and Mispel Road, which serves the southern parking area and athletics stadium, as well as two access points from Bill Bezuidenhout Drive, which serve the leased areas, and the Velodrome. A total of 379 bays have been provided for the leased areas while approximately 890 formal and informal on-site bays are available to the Velodrome and Athletics Track.

6.3.6 Santam: Head Office (Area 7)

The Santam Head Office consists of two office buildings totalling 16 963 m² of floor space. The majority of the parking serving the development (440 bays) is structured below the buildings. The access point to the site is from Carl Cronje Drive. The Elsieskraal River runs along the southern portion of the property.

6.3.7 Tyger Valley Shopping Centre (Area 8)

The Tyger Valley Centre is a regional shopping facility that provides a range of retail and entertainment opportunities. Of the 56 000 m² bulk rights approved for the property, 49 794 m² has been utilised. As part of their rights, a further 5 500 m² of extensions will shortly commence to enlarge the trading areas of some of the main tenants.

A total of 5 159 parking bays have been provided, mainly in the form of surface parking. The parking deck on the south-western side of the building is currently being extended along the entire western side of the centre and will provide a further 1 000 bays on completion. The Centre has four access points of which the one way entrance and exit points on Bill Bezuidenhout currently carry the most traffic. The other access points are from Old Oak Road and from Carl Cronje Drive.

6.3.8 City of Tygerberg: Mini-Cape (Area 9)

The property is currently vacant except for the Doordekraal substation next to Carl Cronje Drive, and the bowling greens on the northern portion of the site that are currently leased by the Bellville Sports Federation. One access point from Carl Cronje Drive serves the property.

6.3.9 Propnet: Kenridge (Area 10)

The northern portion of this property next to Carl Cronje Drive contains the old prison buildings that are currently utilised as craft market-type retail facilities. In terms of the development approval for the property, this portion will be redeveloped into a mixed-use area with office, residential and speciality retail functions that will include hotels, restaurants and a market square. The precinct will provide 80 400 m² of office and business floor area.

The Elsieskraal River that runs through the centre of the property forms the focus of the open space system. The portion to the west of the river system will be used for a combination of single and general residential units. A total of 315 residential units are planned.

Three access points have been approved. The access point from Mara Street in Welgemoed to the west will serve the residential units on the western side of the property only. Through traffic has been prevented across the property. The areas to the east of the river as well as one residential precinct to the west will have access from Carl Cronje Drive. The main access will be opposite the Old Oak Road intersection, and a left in/left out access will be provided further to the north.

6.3.10 Monex: Waterfront (Area 11)

The development on this property, which is currently vacant, will include a combination of office, higher density residential and business uses including festive retail, hotels and restaurants. The development has been afforded bulk rights for 101 000 m² of office and business floor area with an additional 18 000 m² of residential rights (150 units @ 120 m²). The Elsieskraal River runs along the eastern portion of the property.

The site will have two access points off Carl Cronje Drive. The main access will be a signalised entrance that corresponds with the Bill Bezuidenhout intersection and a left in/left out access will be provided further to the north.

6.3.11 Tyger Waterfront (Area 12)

The development on this property, which is currently vacant, will include a combination of office, higher density residential and business uses including festive retail, hotels and restaurants. A total of 87 400m² of office and business bulk and 15 850 m² of residential bulk (132 units @ 120 m²) have been approved. The Elsieskraal River runs along the southern portion of the site along Carl Cronje Drive.

The property will have two signalised access points from Carl Cronje Drive.

6.3.12 University of Stellenbosch: Bellvillepark Campus (Areas 13 & 14)

The Bellvillepark Campus currently includes the Business School and Van Der Horst buildings, which house the Post-graduate School of Business, the School of Public Administration and the Department of Part Time Studies. Two residential buildings, of which one is currently under construction, provide hotel-type accommodation for people attending short courses. A total of 11 995 m² floor area has been provided with 285 parking bays serving the development. The campus currently serves a student population of 1 033, but will ultimately serve a population of 7 000 students.

The northern portion of the property has been used by Waste-Tech as a landfill site. The approximately 20 ha will not be available for development other than low intensity sports and parking facilities for at least 30 years. A portion of land, located south of the landfill area, is under short-term lease for use as offices by Waste-Tech for the purposes of monitoring and remediation. A portion to the south of the Campus is being used as a golf driving range on the basis of a 20-year lease.

There is currently no access to the University Campus from Carl Cronje Drive. The current access is from the Hoheizen road system to the west. The golf driving range and Waste-Tech site both have temporary access points from Carl Cronje Drive.

It must be emphasized that the above development rights are considered a "fix" in the evaluation of factors which influence development in the ERV. Having analysed the private domain in the context of local planning and development forces, attention is now given to the public environment.

Table 2: Approved Rights : ERV Partners

ERV Partners : Bulk/GLA Analysis

Property/ Owner Name	Area	J&G Zone	Zoning	Total Erf Area (ha)	Average Bulk Factor for Site ¹		Average Bulk Factor Ratio per Use	Bulk Rights (m ²)	Utilised Bulk (m ²)	Available Bulk (m ²)	GLA Rights (m ²) ²	Utilised GLA (m ²) ³	Available GLA (m ²)
Metropolitan Life	1	20,21	Office Park	9.2890	0.97	O:	0.97	90150	56842	33308	76628	48316	28312
Metlife Kommando	2	22	Office Park	0.3100	0.60	O:	0.60	1860	1704	156	1581	1448	133
Tyger Terraces	3	26	Office Park	1.1006	0.60	O:	0.45	4953	0	4953	4210	0	4210
						B:	0.15	1651	0	1651	1403	0	1403
Johnnic	4	26	Secondary Business	1.2891	1.20	O:	0.70	9024	0	9024	7670	0	7670
						B:	0.50	6446	0	6446	5479	0	5479
Sanlam	5	30	Office Park	5.9666	0.65	O:	0.57	34000	20000	14000	28900	17000	11800
						B:	0.08	5000	0	5000	4250	0	4250
Sportika - City of Tygerberg	6	27,29	Private Open Space	15.2000				6242	6242	0	5306	5306	0
Sanlam	7	28	Office Park	2.7054	0.63	O:	0.63	16963	16963	0	14419	14419	0
Tyger Valley Centre	8	56 - 59	Secondary Business	22.2000	0.25	B:	0.25	56000	49794	6206	86085	76537	9548
Mini Cape - Tygerberg	9	50	Undetermined	7.2600									
Kenridge - Propnet	10	49	Subdivisional Area ⁴	21.3000	0.65	O:	0.19	40200	0	40200	34170	0	34170
						B:	0.18	40200	0	40200	34170	0	34170
						R:	0.28	59220	0	59220	59220	0	59220
Monex - Waterfront	11	47,48	Subdivisional Area	11.4700	1.04	O:	0.45	50500	0	50500	42925	0	42925
						B:	0.44	50500	0	50500	42925	0	42925
						R:	0.15	18000	0	18000	18000	0	18000
Tyger Waterfront	12	99,100	Subdivisional Area	11.9900	0.86	O:	0.37	43700	0	43700	37145	0	37145
		102				B:	0.36	43700	0	43700	37145	0	37145
						R:	0.13	15850	0	15850	15850	0	15850
Stellenbosch- Waste Tech	13		Education	11.5000									
Stellenbosch- Education	14	101	Education	60.6000	0.02	E:	0.02	11995	11995	0	8302	8302	0
TOTAL				171.000				50151	13220	36931	36622	79171	32421

1. Where no bulk factor was available, an average for the approved bulk rights was used. For consistency, total site area was used for the calculation
2. GLA has been calculated at 85% of total floor area where no information was available, except the Tyger Valley Centre that received a broader definition for GLA.
3. GLA has been calculated for office and business only
4. Where a mix of office and retail is possible, a 50/50 ratio is assumed.

O: Office
B: Business
R: Residential
E: Education

Table 2: Approved Rights : ERV Partners

ERV Partners : Parking Analysis

Property/ Owner Name		Parking Bays Required to GLA Rights ⁵	Parking Bays Required to Utilised GLA	Existing # of Parking Bays	Existing Shortfall/ Surplus	Future # of Parking Bays ⁶	Total # of Bays on Site	Total Shortfall/ Surplus	Existing # of People ⁷	Future # of People	Total Number of People	Comments
Metropolitan Life	O:	3065	1933	1393	-540	1132	2525	-540	2387	1071	3458	Includes current development;
Metlife Kommando	O:	63	58	28	-30	35	63	- 0		66	66	Recreation Centre; in future could be developed in terms of zoning
Tyger Terraces	O:	168	0	0		168	168		0	177	177	Currently undeveloped; Assuming further rights in terms of residential only
	B:	84	0	0		84	84		0	56	56	
Johnnic	O:	307	0	0		307	307		0	322	322	Currently undeveloped
	B:	329	0	0		329	329		0	219	219	Currently undeveloped
Santam	O:	1156	680	680		714	1394	238	715	500	1215	Parking calculations for future offices done at 6/100 m ² of GLA
	B:	255	0	0		255	255			170	170	Proposing a mixed-use development next to road intersection
Sportika - City of Tygerberg		318	318	379	61		379	61				
Santam	O:	577	577	440	-137	80	520	-57	655	95	750	Only leased areas
Tyger Valley Centre	B:	5165	4592	5159	587	1000	6159	994	3000		3000	Current development included
Mini Cape - Tygerberg												No current rights; part being leased for bowling greens
Kenridge - Propnet	O:	1367	0	0		1367	1367		0	1435	1435	Currently undeveloped
	B:	2050	0	0		2050	2050		0	1367	1367	Buildings on site will be demolished, therefore not included
	R:	630	0	0		630	630		0	945	945	Number of units : 315
Monex - Waterfront	O:	1717	0	0		1717	1717		0	1803	1803	Currently undeveloped
	B:	2576	0	0		2576	2576		0	1717	1717	
	R:	300	0	0		300	300		0	450	450	Number of units calculated at 120 m ² /unit = 150 units
Tyger Waterfront	O:	1486	0	0		1486	1486		0	1560	1560	Currently undeveloped
	B:	2229	0	0		2229	2229		0	1486	1486	
	R:	264	0	0		264	264		0	396	396	Number of units calculated at 120 m ² /unit = 132 units
Stellenbosch- Waste Tech												Development will be limited to sporting facilities
Stellenbosch- Education	E:	2800	285	285		2515	2800		1033	5957	7000	Assignable m ² (ASM) taken as GLA
TOTAL		28905	6418	6321	761	10315	27620	-55	7220	18932	27652	

5. Parking ratios calculated at : Office - 4 bays/100 m² GLA; Retail - 6 bays/100 m² GLA; Residential - 2 bays per unit; 1 bay per 2.5 students.

6. Parking bays required for development of available bulk

7. Occupant numbers calculated at : Office - 42/1000 m² GLA; Retail - 1/25 m² GLA; Residential - 3 people per unit.

O: Office
 B: Business
 R: Residential
 E: Education

7.0 ANALYSIS OF THE PUBLIC ENVIRONMENT

In this section the public environment is analysed in terms of the current situation regarding the quality and availability of services infrastructure, vehicular and pedestrian movement systems, parking and the quality of the public spaces.

7.1 Bulk Services Infrastructure

The bulk services infrastructure in the ERV (Figure 22) is regarded as sufficient to accommodate future development.

7.1.1 Sewerage System

The area is served by a newly installed 600mm ϕ sewer connection, which runs parallel to Carl Cronje Drive and the upper portion of the Elsieskraal River across the Propnet site.

7.1.2 Water Reticulation

A 250-mm ϕ ring network, which runs along portions of Willie van Schoor Drive, Mispel Road, Carl Cronje Drive, Bill Bezuidenhout Drive and Old Oak Road, serves the study area. Along with the proposed extension along Carl Cronje Drive, this system will be adequate for the development in the ERV. An additional reservoir may be necessary to accommodate the demand estimated for future development.

An extension to the water network, which serves the Welgemoed area, is proposed along the ridgeline on the western side of the Monex and Propnet sites.

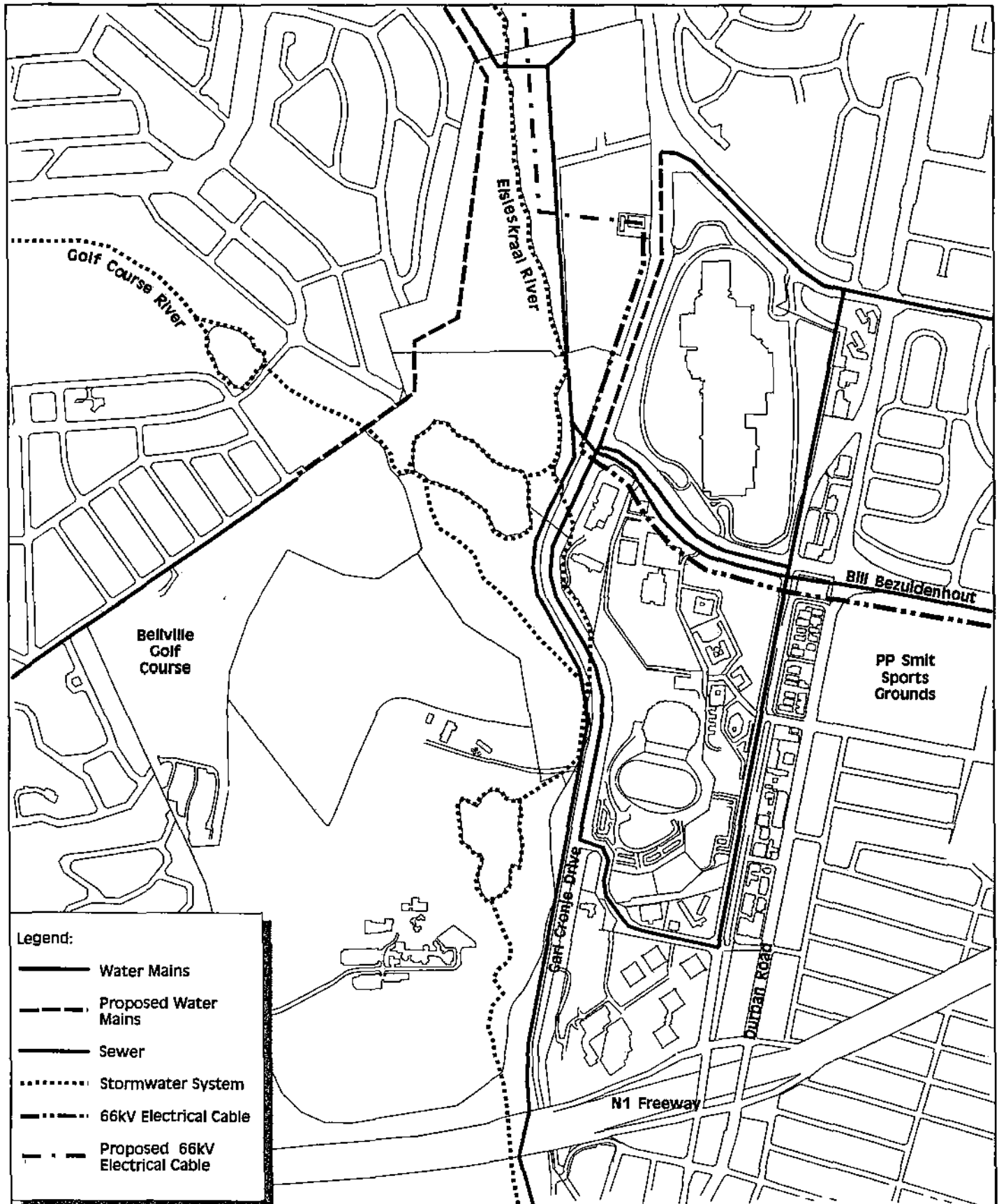
7.1.3 Electricity

A 66kV overhead power line, which runs from the Oakdale substation east of the study area, enters the ERV along Bill Bezuidenhout Drive, before running along Carl Cronje Drive to the Doordekraal substation on the Mini-Cape site. The Oakdale substation is currently being used at 96% of its capacity and it is estimated that its full capacity will be exceeded in 1999. The Doordekraal substation therefore requires an alternative source of supply to prevent the deterioration of the supply quality to the ERV.

The Westhof substation to the north-west of the ERV has been identified as the only economically viable alternative source. The new 66kV power line link will enter the ERV from the north and run along the Elsieskraal River to the Doordekraal substation. Additional equipment will have to be installed at the substation to accommodate the new incoming lines. This will accentuate the visual impact of the substation.

Because of the economic importance of the ERV, the Tygerberg Council has taken a policy decision to install the new 66kV cable underground and to replace the existing overhead cable with an underground cable from the PP Smit Sports Ground to the Doordekraal substation.

The capacity of the Doordekraal substation will in the long term be doubled from 20 MVA to 40 MVA by means of additional transformers. This will ensure sufficient capacity to accommodate future growth and development in the area.



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ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

Services & Infrastructure



N.T.S

Figure 22

7.1.4 Stormwater System

The stormwater system in the ERV is based on the Elsieskraal River. The features and components of this system as well as the main concerns regarding the river system between the Doordekraal Dam and the N1 Freeway are illustrated in Figure 23. Appendix A - Elsieskraal River Valley: Synopsis of Available Information, May 1998 contains a summary of the major aspects of the stormwater system.

The most important concerns regarding the different reaches of the river system, as discussed in the synopsis, are highlighted below.

The first reach of the river covers the portion between Van Riebeeckshof Road and the Monex Waterfront. The Doordekraal Dam, although having a limited capacity, plays an important role as a retention facility. Below the dam, the 50-year flood line needs to be determined. Although the current development on the Propnet site used the dambreak flood lines to determine the limit of development, these lines should only be regarded as relevant for appropriate evacuation planning and should be determined for a distance of several kilometres down the river.

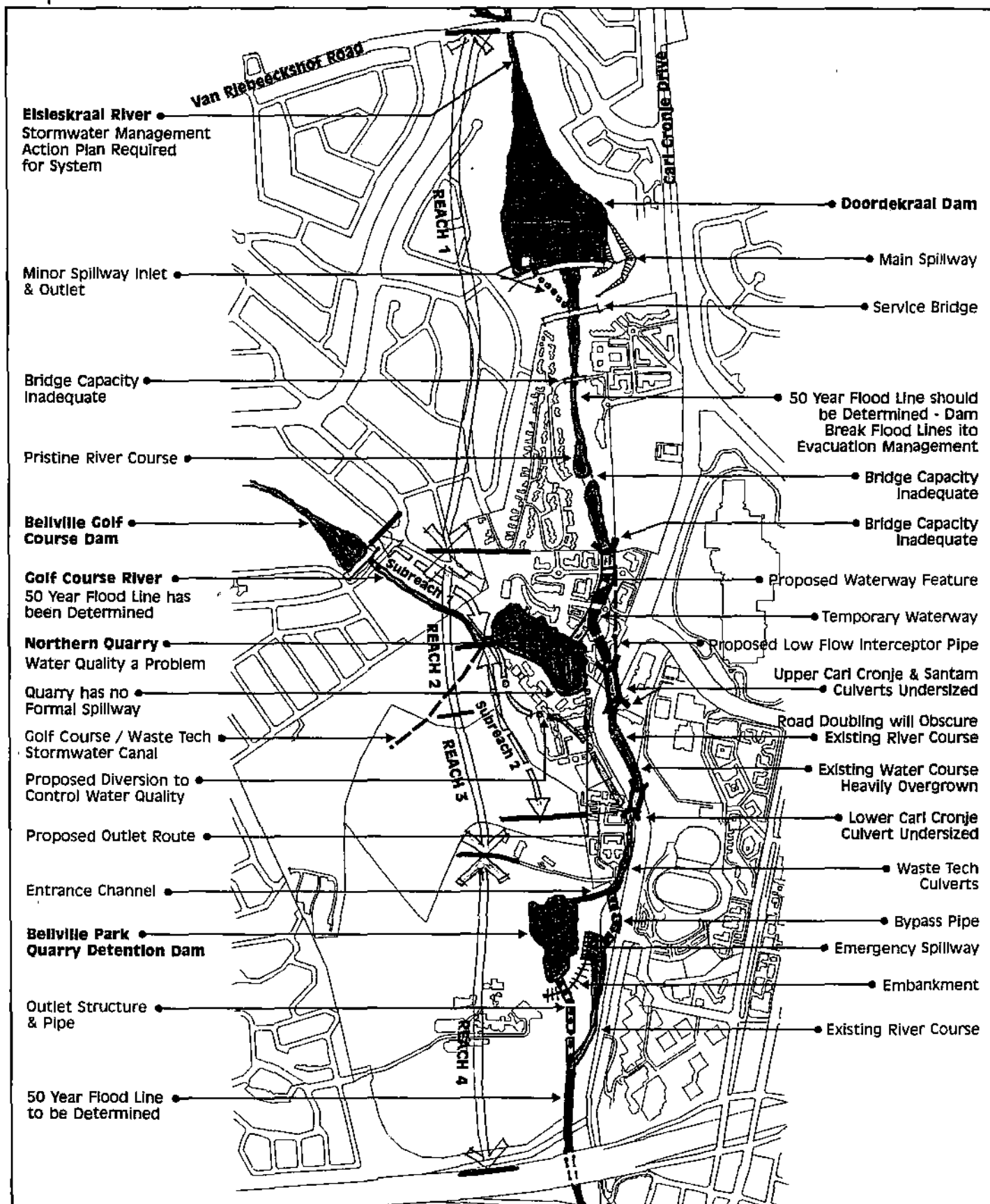
Reach 2 stretches from the Monex Waterfront to the crossing of the river under Carl Cronje Drive. The river currently flows through a temporary diversion channel, but it is planned that winter floods will ultimately be passed into the northern quarry by means of a waterway, with the low flows being diverted past the quarry to prevent pollution of the water body. This reach also includes two subreaches of the stream draining the Bellville Golf Course which extends from the Golf Course Dam to the link of the proposed diversion pipe with the Elsieskraal River.

The northern quarry currently has no formal spillway and could cause flooding. In order to control the water quality of the northern quarry it is proposed that the Golf Course flow also be diverted away from the northern quarry. Low flows and floods will be diverted along a proposed waterway to rejoin the Elsieskraal River further south. Stormwater runoff from the Waste-Tech site, which includes high volumes of sand, is currently spilling into the northern quarry and affecting the water quality.

Reach 3 covers the portion between the upper Carl Cronje culvert and the Waste-Tech culverts north of the Bellvillepark detention dam. The river runs to the east of Carl Cronje Drive for a large portion of this reach and flows through three culverts which are all currently too small to handle major floods. The natural river course on the eastern side of Carl Cronje Drive is overgrown and urgently needs to be cleared of silt to prevent the flooding of Carl Cronje Drive. Maintenance and management of the system are therefore important aspects to be addressed. To prevent potential flooding, it has been proposed that a channel or culvert be constructed on the western side of Carl Cronje Drive to accommodate floodwater. Normal low flows could continue to flow in the existing river channel. This proposal supports the concept of creating a continuous water system on the western side of Carl Cronje Drive and the channel could be turned into a landscaped water feature.

Reach 4 stretches from the Waste-Tech bridge to where it runs under the N1 and includes the Bellvillepark Quarry detention dam. The Waste-Tech culverts are both slightly undersized. The entrance channel to the detention dam commences directly downstream from the Waste-Tech bridge. At this point a large bypass pipe culvert diverts low flows around the eastern side of the quarry, discharging back into the river opposite the dam's emergency spillway. The outlet pipe culvert of the dam joins the river some 300m further south. The dam is the major component of the total stormwater system in the ERV. A section of the river course to the south of the dam is estimated to have little capacity to accommodate floods and therefore widespread flooding would occur. The Bellvillepark detention dam, however, plays an important role in preventing flooding further downstream. The 50-year flood line for the portion of the river between the dam and the N1 Freeway needs to be determined.

It is evident that a stormwater management plan for the ERV is necessary to prevent flooding, maintain the river course and address the pollution of the water bodies.



7.2 Vehicular & Pedestrian Movement Systems

The major movement systems in the ERV are north-south orientated and primarily based on the Willie van Schoor Drive/Durban Road two-way couplet and Carl Cronje Drive (Figure 24).

The Willie van Schoor Drive/Durban Road two-way couplet's main function in the vicinity of the study area is that of an activity route. However, its design, which includes service roads, and its function as a regional distributor have encouraged higher mobility. Public transport is limited to this movement system with isolated stop points being provided along the route to serve the bus service between the Bellville CBD and Durbanville.

Carl Cronje Drive currently functions as a local mobility route and mainly serves the surrounding residential areas. The upgrade of the portion north of the Bill Bezuidenhout intersection to a dual carriageway has increased mobility in the study area. Both the north-south road systems provide access to the currently developed land parcels in the Valley.

Within the study area, the north-south movement systems are supported mainly by three east-west road links. Bill Bezuidenhout Drive and Old Oak Road are district distributor roads that provide access to the Valley mainly from east of the study area and provide links between the two north-south movement systems. Mispel Street is also an important road link between the north-south routes. Its capacity is limited and may need to be increased through upgrading. Bloemhof Street is a local distributor that provides access from the Oakdale and Ridgeworth residential areas to the east.

Only the major intersections in the Valley are currently signalised. These are to the intersections of the north-south routes with the east-west access routes to the area as well as the off-ramp from the N1 Freeway. The majority of the site access roads currently function with unsignalised intersections. Some of these, such as the Santam access road onto Carl Cronje Drive and the two Sportika access points onto Bill Bezuidenhout Drive are experiencing flow problems in terms of their functioning. The Bellvillepark Campus has no access from the Valley. The signalised Durban Road - Old Oak and Carl Cronje Drive - Mispel Street intersections are currently the most critical in terms of capacity and performance in the ERV.

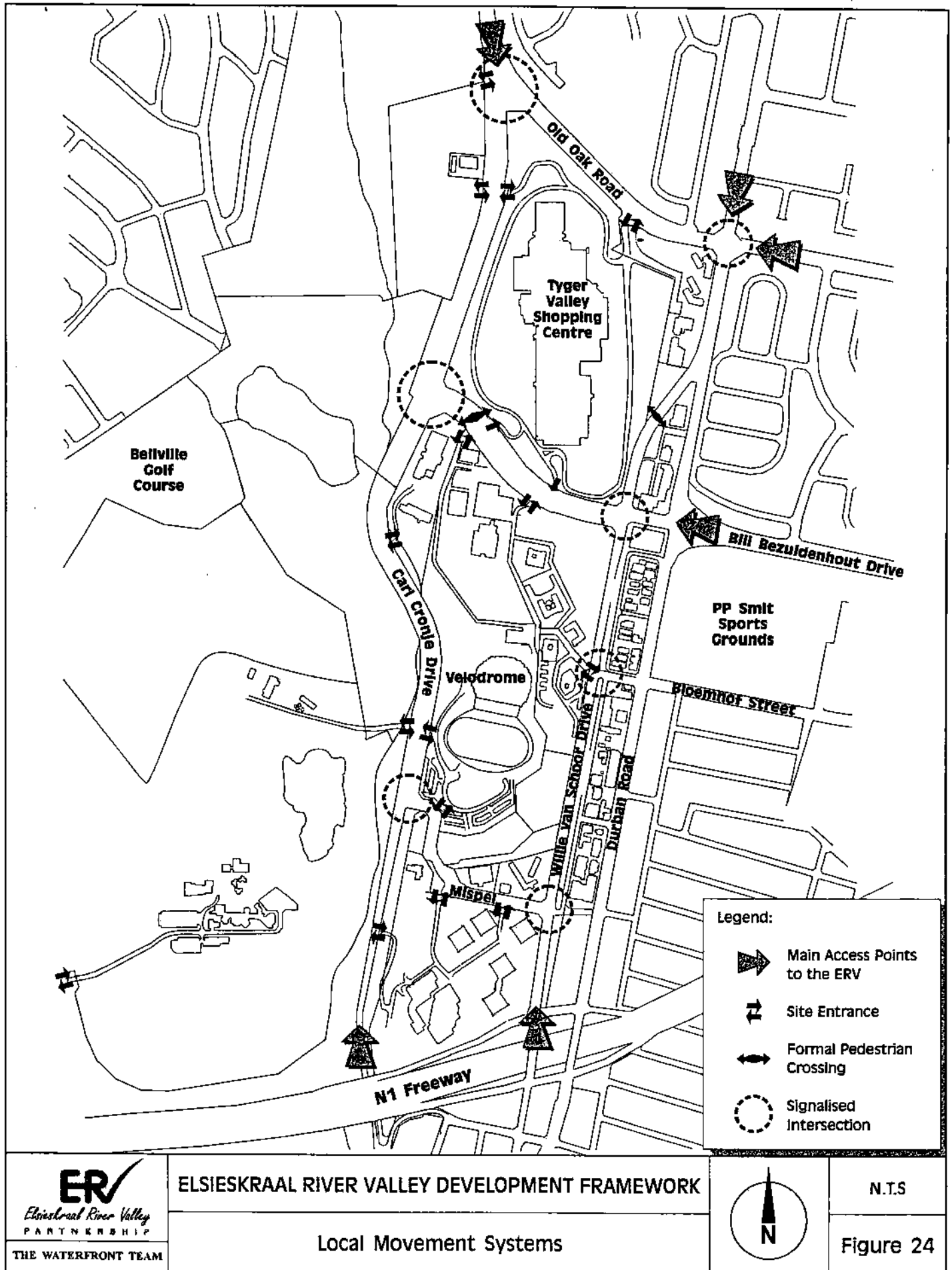
Pedestrian movement in the area is limited, mainly because of the nature and design of the roads. The high speed and width of roads such as Willie van Schoor Drive and Bill Bezuidenhout Drive have prevented a pedestrian-friendly environment. On both the roads at-grade pedestrian crossings have been provided, mainly providing access to the Tyger Valley Centre from the surrounding office development. These crossings are however dangerous and therefore seldom used. Office staff in the Valley prefers to use their vehicles to get to the shopping centre during lunch hours, rather than to walk. Where pedestrian movement does take place, it is mainly north-south movement along the intensely developed Durban corridor. Carl Cronje Drive is currently utilised for jogging and cycling but this is mainly limited to the western side of the road as it provides the only sidewalk through the culvert underneath the N1 Freeway.

It is therefore important that in order to create a more sustainable movement system in the ERV, the existing north-south movement routes are strengthened and east-west pedestrian movement is encouraged.

7.3 Parking Supply & Availability

The main concentration of the current parking supply is located within the partially developed central sector between Carl Cronje Drive and Willie van Schoor Drive (Figure 25). This sector provides approximately 9 144 parking opportunities of which 5 721 are surface parking bays, approximately 100 are informal and the remaining 3 323 bays are structured within the buildings or provided in decked parking areas, such as the Tyger Valley Centre.

The only current parking provided to the west of Carl Cronje Drive are 285 bays at the Bellvillepark Campus, but which are not accessible from the ERV, and approximately 190 informal parking opportunities along the length of Carl Cronje Drive. The remainder of the current parking bays as indicated by the figure, is provided along the intensely developed Durban Road corridor. Of the approximately 1 887 parking opportunities provided in the corridor, 1 337 are on-site or on-street surface bays, 358 bays are structured within the buildings and the remaining 192 are informal.

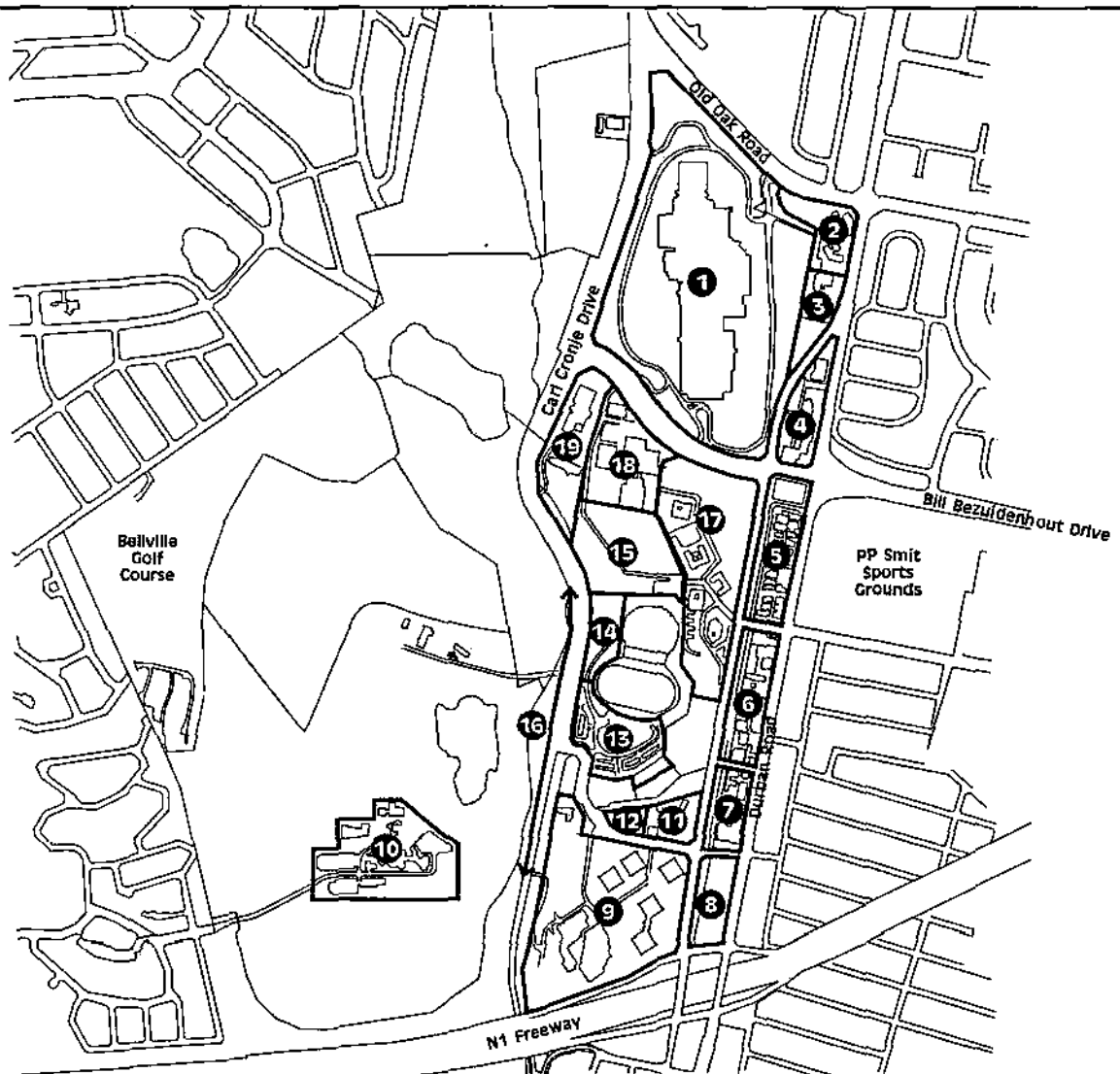


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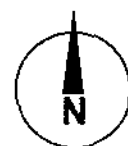
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ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

Local Movement Systems



No	Property	Surface	Structured	Informal	Total
1	Tyger Valley Centre	3633	1526	-	5159
2	Tyger Valley Office Park	168	-	72	240
3	Santyger	239	36	-	275
4	Bridgeport	235	-	-	235
5	Between Antrim & Bloemhof Rd	307	91	-	398
6	Between Bloemhof & Oakdale Rd	197	57	-	254
7	Between Oakdale & Mispel Rd	191	174	-	365
8	PAWC: Between Mispel & N1	-	-	120	120
9	Metropolitan Life & Commando	590	831	-	1421
10	University of Stellenbosch	285	-	-	285
11	City Lodge	55	-	-	55
12	Corporate Place	50	70	-	120
13	Sportika: South of Stadium	630	-	-	630
14	Sportika: West of Velodrome	160	-	-	160
15	Sportika: North of Velodrome	-	-	100	100
16	Along Carl Cronje Drive	-	-	190	190
17	Sanlam: Tijger Park	154	526	-	680
18	Health & Raquet, Logans	379	-	-	379
19	Santam	70	370	-	440
Total Parking Bays		7343	3681	382	11506



The total number of parking opportunities in the Valley to the west of Durban Road add up to approximately 11 506 bays. The demand for parking in the Valley has been relatively high and although the parking requirements for, for example, the office developments have been calculated at a higher ratio than the national average, (4 bays/100m² GLA compared to 2 bays/100m² GLA) parking availability is a major issue, especially in the Durban Road corridor.

For the purpose of large events held at venues such as the Velodrome, the City of Tygerberg has entered into agreements with some of the ERV landowners, namely Sanlam and the Tyger Valley Centre, for the use of their surface parking. Large open areas such as the PP Smit Sports Grounds are also made available for parking at those times. This arrangement has increased the number of parking bays available for large events and allows for the counter-cyclical use of parking areas and facilities. It is important that the practise of shared, counter-cyclical use is extended as further development in the ERV takes place.

7.4 Open Space Network

The open space network plays an important part in the integration and functioning of an urban area as well as the experience that it presents to the individual. This section focuses on the location and quality of the open spaces in the ERV and the current street edge conditions.

7.4.1 Current Open Spaces

The network of open spaces in the ERV is based on three main elements. These elements can be distinguished as the sensitive environmental elements, the community open space facilities and the hard open space locations (Figure 26).

The sensitive environmental elements that form part of the network are the Elsieskraal River system (including the Northern quarry and Bellvillepark quarry detention dam) as well as the western ridgeline and amphitheatre topography. These spaces are not generally accessible because they are mainly located on private land, but form important structuring elements of the overall network.

The river system links into the major community open space facilities that surround the study area. These facilities include the Bellville Golf Course, Angelier Park with the Doordekraal Dam as its focus, as well as the Danie Uys Park and the Jack Muller Arboretum south of the N1 Freeway.

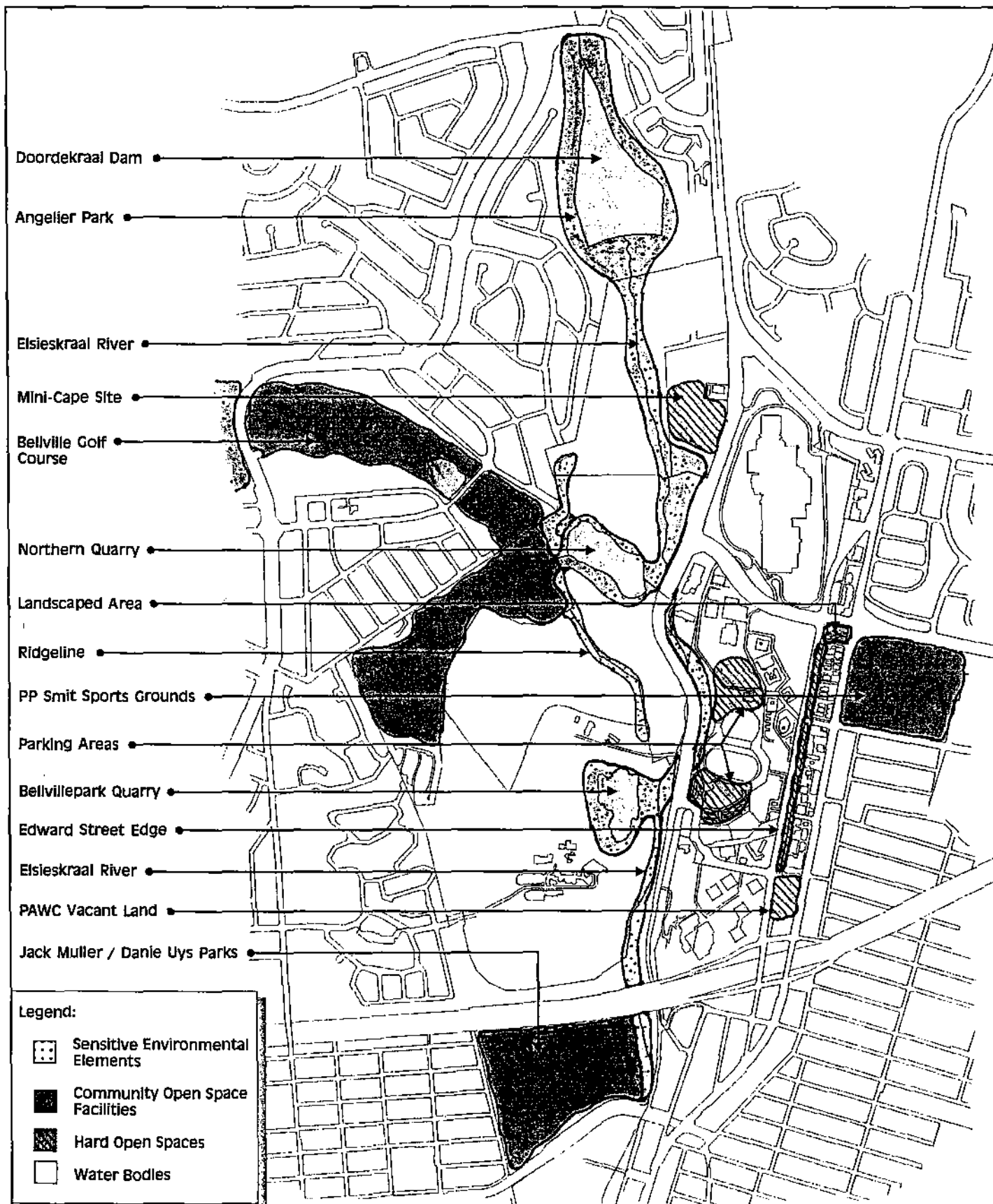
The PP Smit Sports Grounds also functions as a major community open space facility that presents sporting opportunities, including cricket, softball, hockey and soccer, to the local communities. Although it is currently walled off, it can be integrated into the overall open space system and become an important focal area. The PP Smit Sports Grounds is linked to the ERV through the landscaped open space area on the corner of Bill Bezuidenhout Drive and Willie van Schoor Drive.

The hard open space locations in the ERV are focussed on the public land parcels and include the parking areas to the north and south of the sports facilities on the Sportika site, the informal parking area on the corner of Willie van Schoor Drive and Mispel Street, and the Mini-Cape site.

Pedestrian movement between the various elements of the open space system is currently limited due to the absence of a pedestrian network that has resulted in poor levels of local integration and accessibility. The only continuous linear open space route is along the Edward Street service road in the Durban Road activity corridor.

There is no overall planting theme within the ERV and the hard open space locations lack an element of landscaping. Although the landowners have landscaped the perimeters of their land parcels, this planting is not carried through into the public realm and the planting is not always indigenous.

The existing public space elements can be strengthened by means of appropriate landscaping and design. It is important that these spaces be linked so as to provide pedestrians with a safe and pleasant environment through which to move.



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ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

Existing Open Space Network



N.T.S

Figure 26

7.4.2 Street Edge Conditions

The street edge conditions in the ERV do not support movement in the area other than by vehicle. The Elsiekraal River Valley benefits from a high level of regional connectivity, but the nature of the internal roads and the lack of links between the mono-use cellular developments have not facilitated the realization of local integration. The road corridors are not conducive to pedestrian movement, because although some tree planting and landscaping has taken place within certain areas of the road reserves and along road medians, the wide road reserves and lack of formalised sidewalks and pedestrian walkways prevent pedestrian movement. The photos in Figure 27 illustrate the above.

The inward-facing built forms do not relate to the street edges and therefore do not support the vital urban design ingredients such as well defined, secure, vibrant, mixed-use public interfaces. Although the unique natural elements give definition to the Valley, the lack of defining urban elements and a public interface have resulted in a lack of true local identity or sense of place. It is vital that these elements are achieved and that the buildings and building heights relate to the movement systems in order to stimulate pedestrian movement and local integration.

7.5 Existing Activity Systems and Land Use Informants

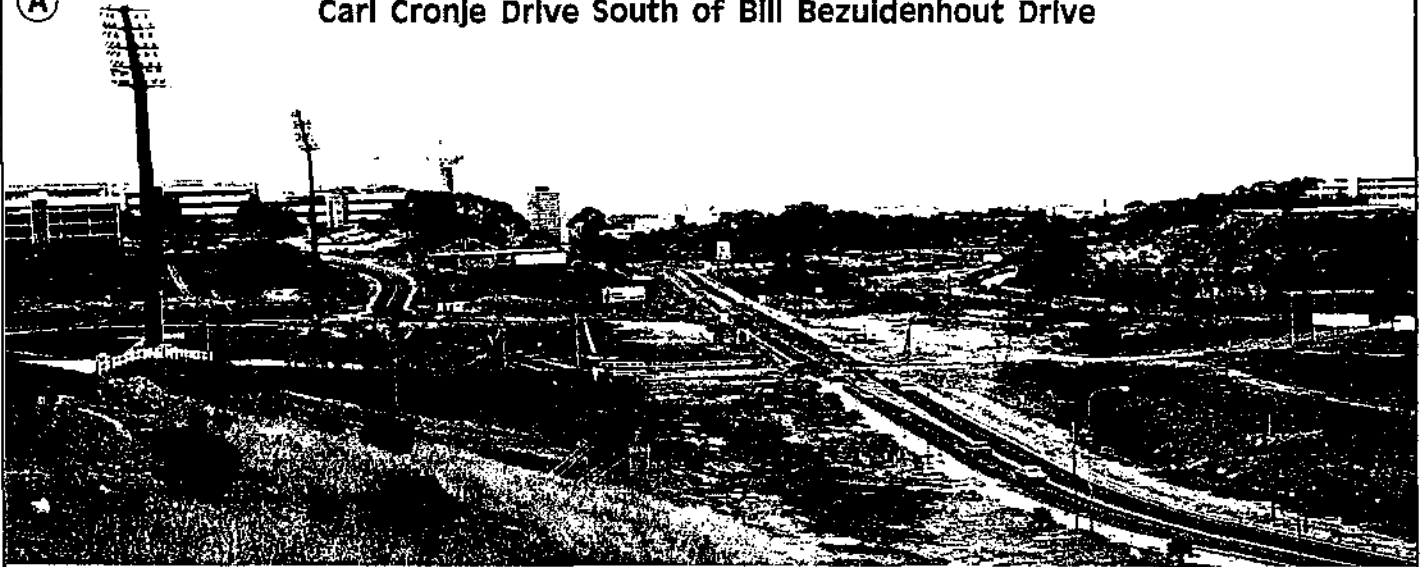
Figure 28 summarises the existing activity systems and land use informants in the ERV. The road network forms a loose grid system as defined by the Carl Cronje Drive and Durban Road/Willem van Schoor Drive north-south road corridors, and the three east-west road links.

Within this system three distinct sectors can be identified within which the land uses have similar characteristics. These are the intensely developed eastern sector along the Willie van Schoor Drive/Durban Road two-way couplet where office development forms the dominant land use. The partially developed central sector between Willie van Schoor Drive and Carl Cronje Drive includes the Tyger Valley Centre retail node, the Velodrome/Athletics Track sports node and various office nodes. Finally, the undeveloped western sector to the west of Carl Cronje Drive features the Bellvillepark educational node and a minor retail node on the Propnet site.

Although the land uses within the western and central sectors do enjoy limited north-south links, east-west connectivity between these sectors is limited. The focus of the development framework therefore has to be on creating links between the three sectors and to strengthen the links between the land uses within each of these sectors.

(A)

Carl Cronje Drive South of Bill Bezuidenhout Drive



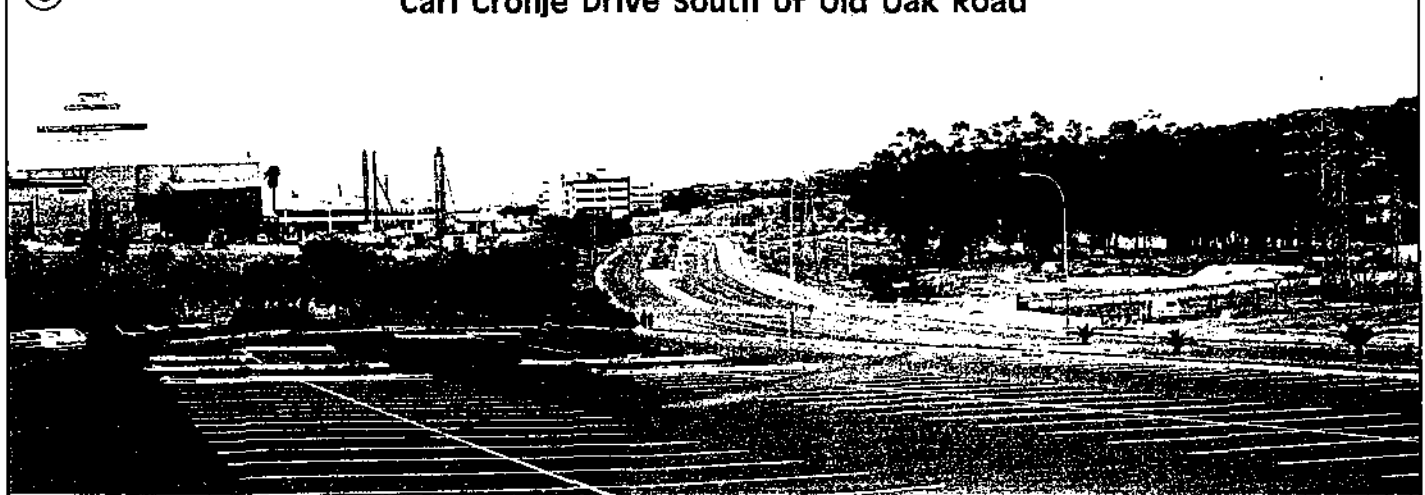
(B)

Carl Cronje - Bill Bezuidenhout Intersection



(C)

Carl Cronje Drive South of Old Oak Road



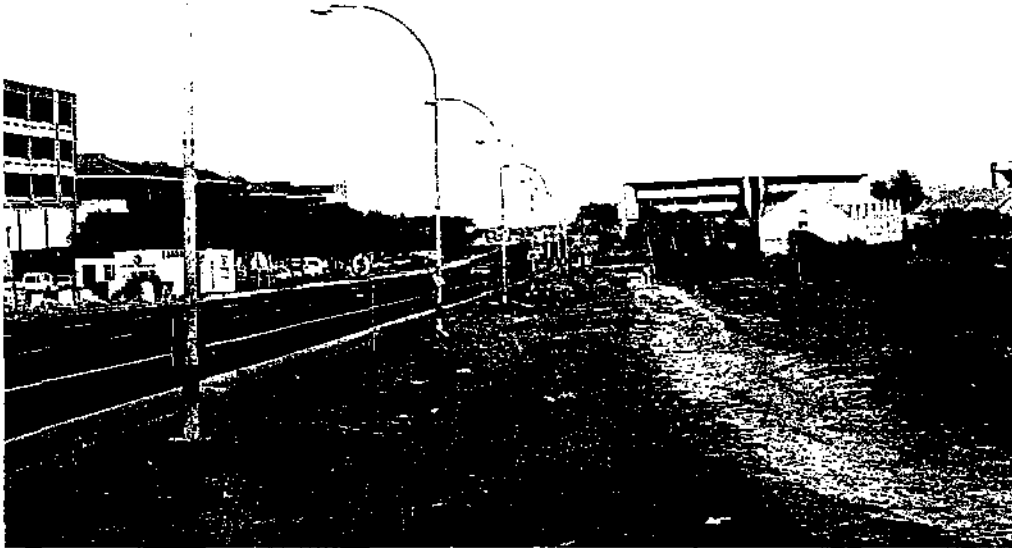
①

Carl Cronje Drive Looking South



②

Wille van Schoor Drive Looking South



③

Bill Bezuidenhout Drive Looking East



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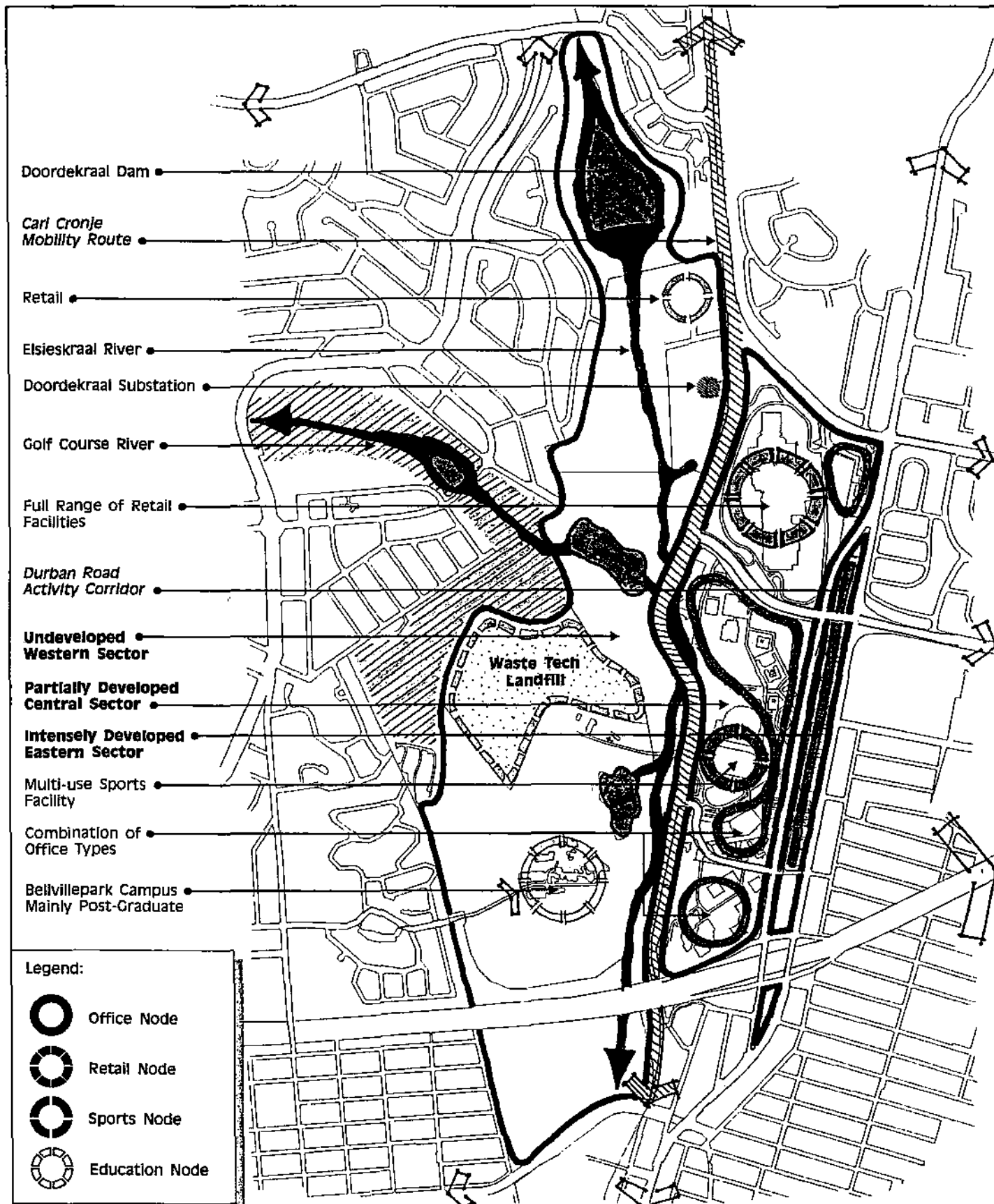
ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

Current Street Edge Conditions



N.T.S

Figure 27



8.0 OPPORTUNITIES AND CONSTRIANTS SYNTHESIS

The foregoing sections have highlighted the most important elements that have impacted on the growth and development of the ERV. These include various strengths and opportunities that exist and which should be harnessed to achieve the development of a balanced, sustainable and unique environment. There are however problems (weaknesses) that need to be addressed and threats that need to be overcome in order to achieve the vision formulated for the ERV.

This section summarises the key considerations that inform the generation of the development framework. The first part of this section is a SWOT analysis of the overall aspects related to the ERV in general and the second part highlights the detailed aspects of each land parcel in the study area by means of conceptual diagrams.

8.1 Opportunities and Constraints of the Elsieskraal River Valley

The findings of the analytical phase of this study can be summarised by means of a strengths, weaknesses, opportunities and constraints synthesis for the Valley.

8.1.1 Strengths

- ◆ Combination of large landowners: a diversity of abilities and competencies
- ◆ Central location: within the CMA and the Tygerberg Municipal Area
- ◆ Good regional accessibility: location in relation to road infrastructure
- ◆ Unique physical environment: Elsieskraal River and topography
- ◆ A mix of high quality uses: retail, sport, office, and education
- ◆ High quality office environment: A-grade corporate image
- ◆ Regional retail centre : important magnet
- ◆ Sufficient service capacity: can accommodate further development

8.1.2 Weaknesses

- ◆ Access from local area : limited local links
- ◆ Shortage of parking : impact of eastern sector on ERV
- ◆ Mono-functional, internally focused development : this type of development is not sustainable
- ◆ Lack of links and local integration : not a pedestrian-friendly environment
- ◆ Road capacity : certain roads and intersections have capacity limitations
- ◆ Nature of roads : allows for high speed.
- ◆ No urban sense of place : limited landmark features

8.1.3 Opportunities

- ◆ Improved access : new road links proposed
- ◆ Creation of river-related landscaped walkways : major structuring element
- ◆ Improved land use balance : focus on higher density residential, strengthen education node
- ◆ Sporting development and sports tourism : use available land and facilities, and explore niche markets
- ◆ Strategically located land parcels in public ownership : can be used to address local needs
- ◆ Tourism, eco-tourism and leisure development : links with natural environment, proposed festival retail and farmlands
- ◆ Pedestrian links and walkway systems : improve local integration and create pedestrian environment
- ◆ Public transport : extend viability of the ERV

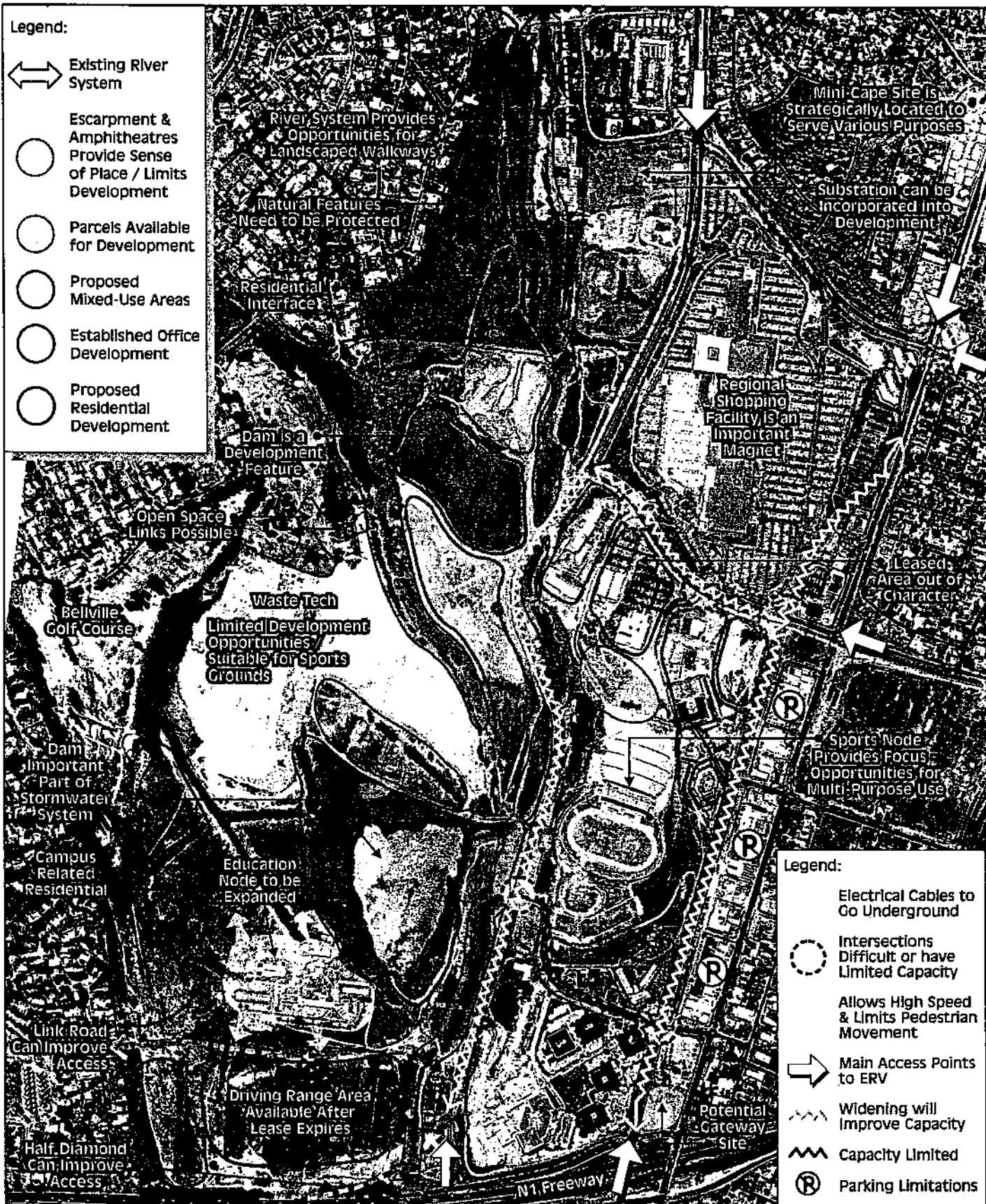
8.1.4 Threats

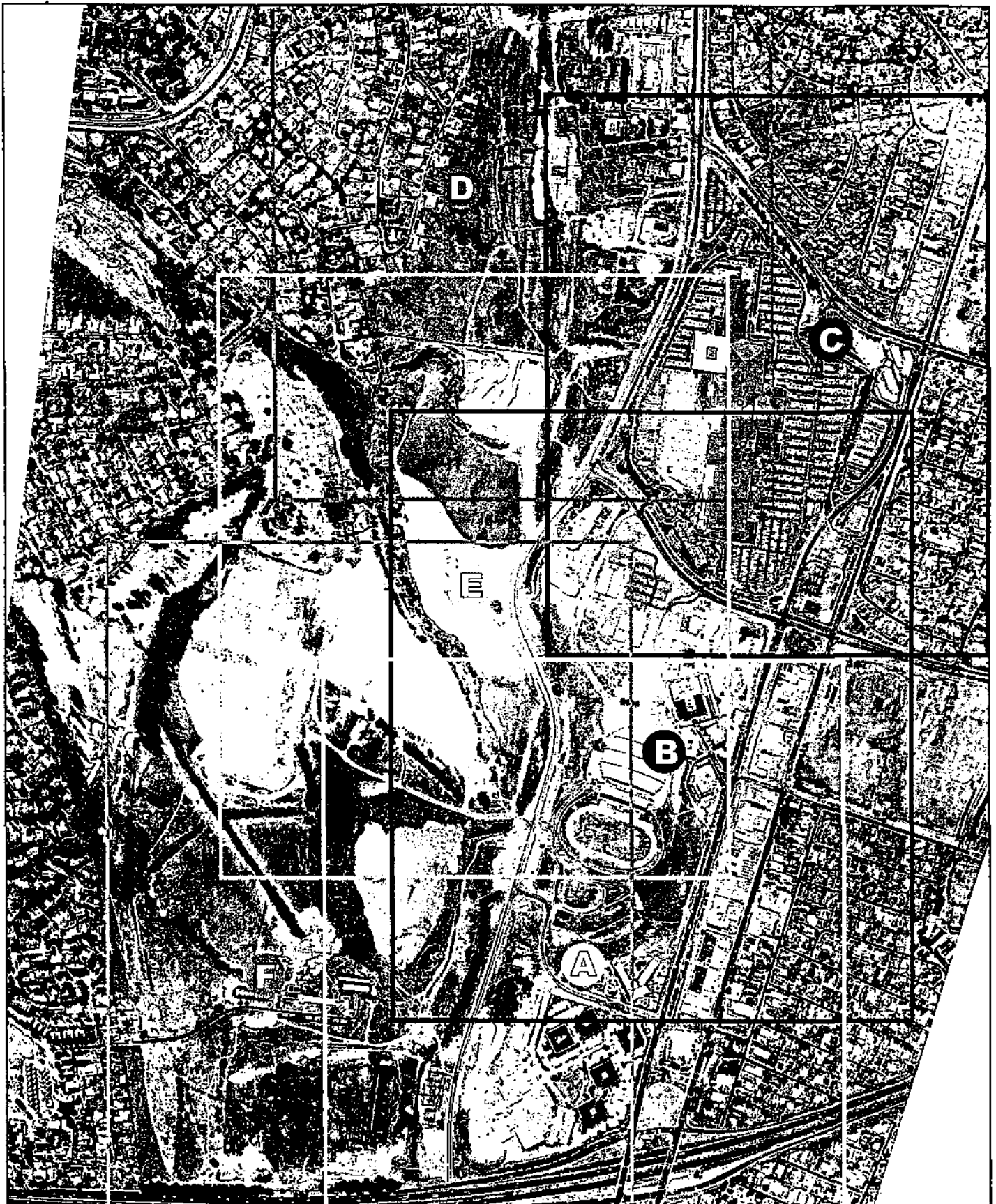
- ◆ Impact of development on natural features : If not managed, could jeopardise environment
- ◆ Overbulking: will decrease property and development values
- ◆ Congestion: traffic needs to be managed
- ◆ Security: issues of criminal activity and vagrants
- ◆ Inappropriate development: does not support the nature and image of the ERV
- ◆ Lack of integrated river management : may cause flooding and prevent use of river as a design feature
- ◆ Large surface parking areas : will limit vibrant environment
- ◆ Large building footprints and heights : will impact on human scale
- ◆ Overhead power lines: affect the economic viability of the ERV

The spatial aspects of the above-mentioned opportunities and constraints are illustrated in Figure 29.

8.2 Opportunities & Constraints of Individual Land Parcels

Figure 30 and Figures 30a – 30f provide a conceptual overview of the development opportunities and constraints of the properties within the ERV. It also highlights certain of the more detailed aspects of the abutting public environment.



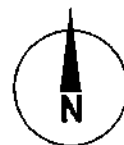


Elsiekraal River Valley
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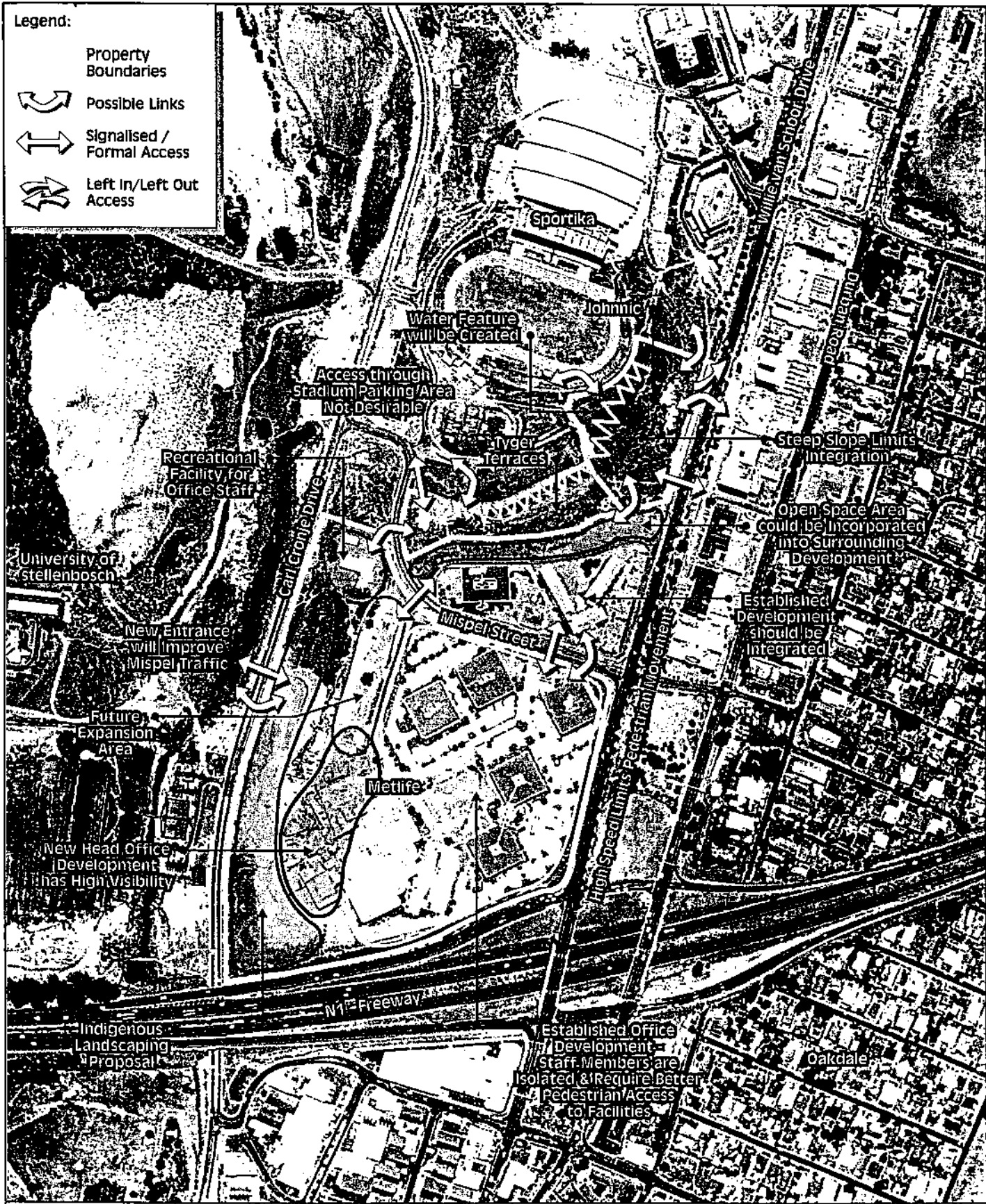
ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

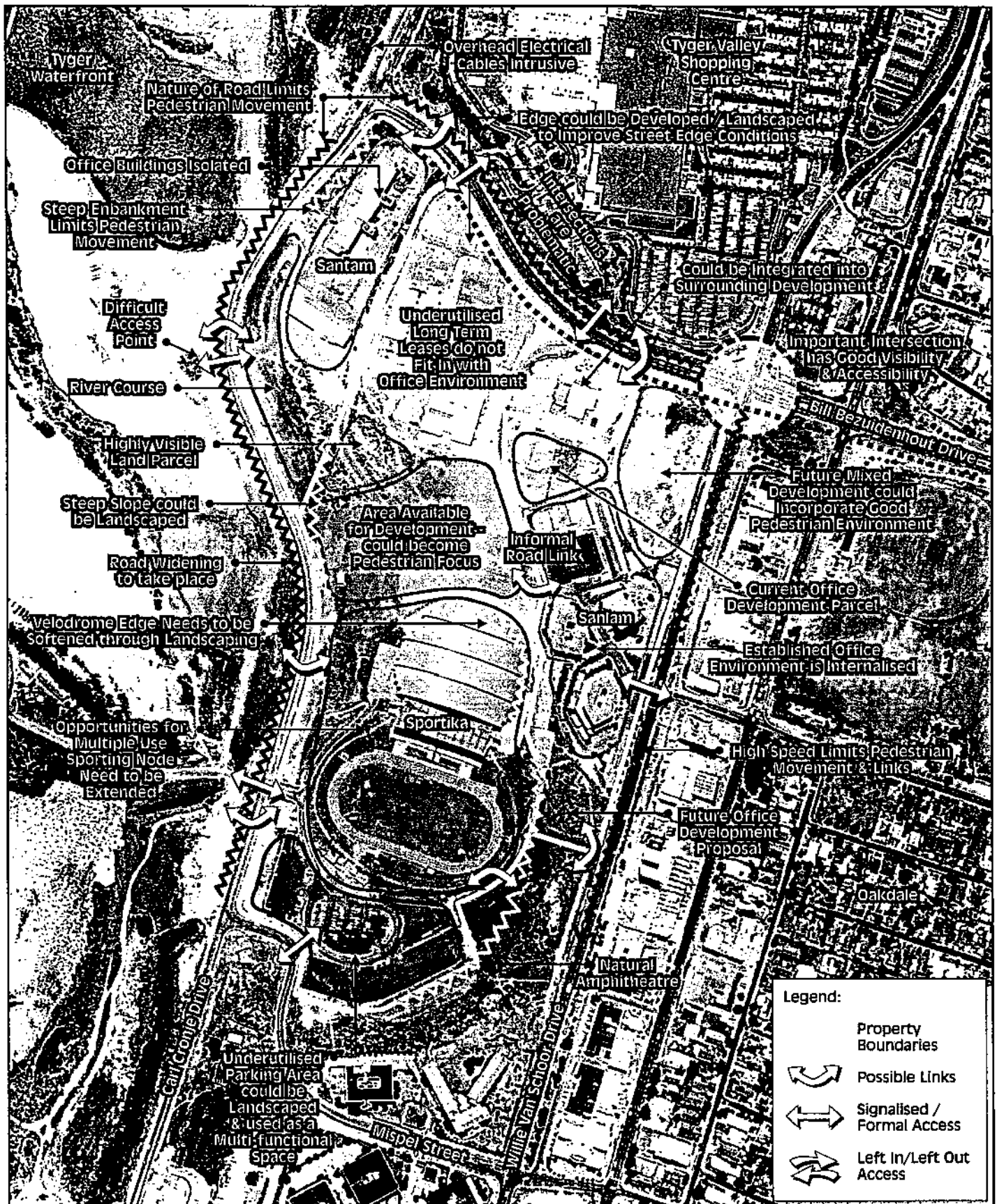
Key Sheet for Opportunities & Constraints
of Landowners



N.T.S

Figure 30





 THE WATERFRONT TEAM	ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK Opportunities & Constraints: Sanlam, Sportika, Santam		N.T.S Figure 30b
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Legend:

Property
Boundaries



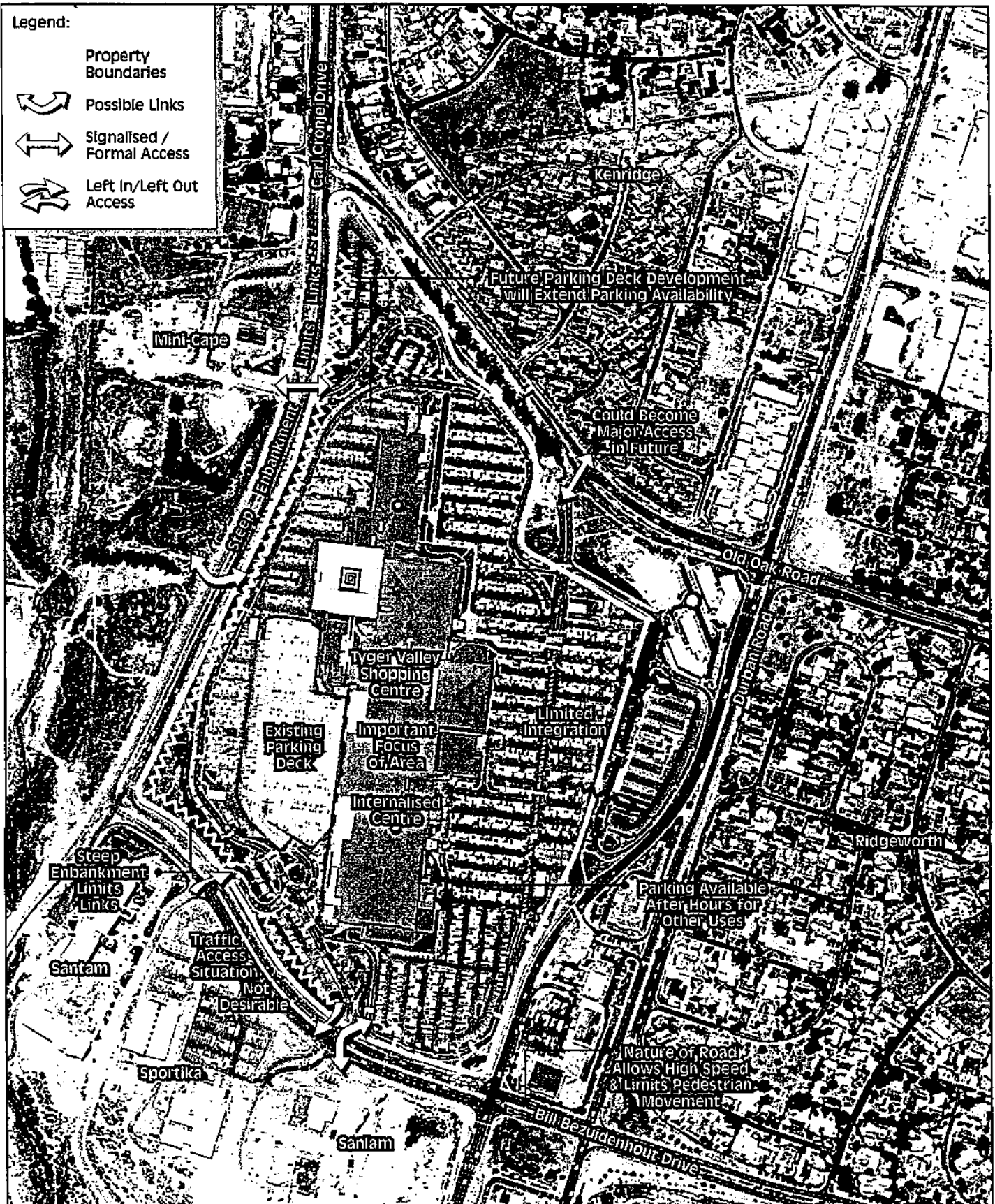
Possible Links



Signalised /
Formal Access



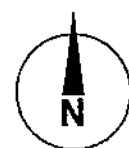
Left In/Left Out
Access



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ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

Opportunities & Constraints:
Tyger Valley Shopping Centre

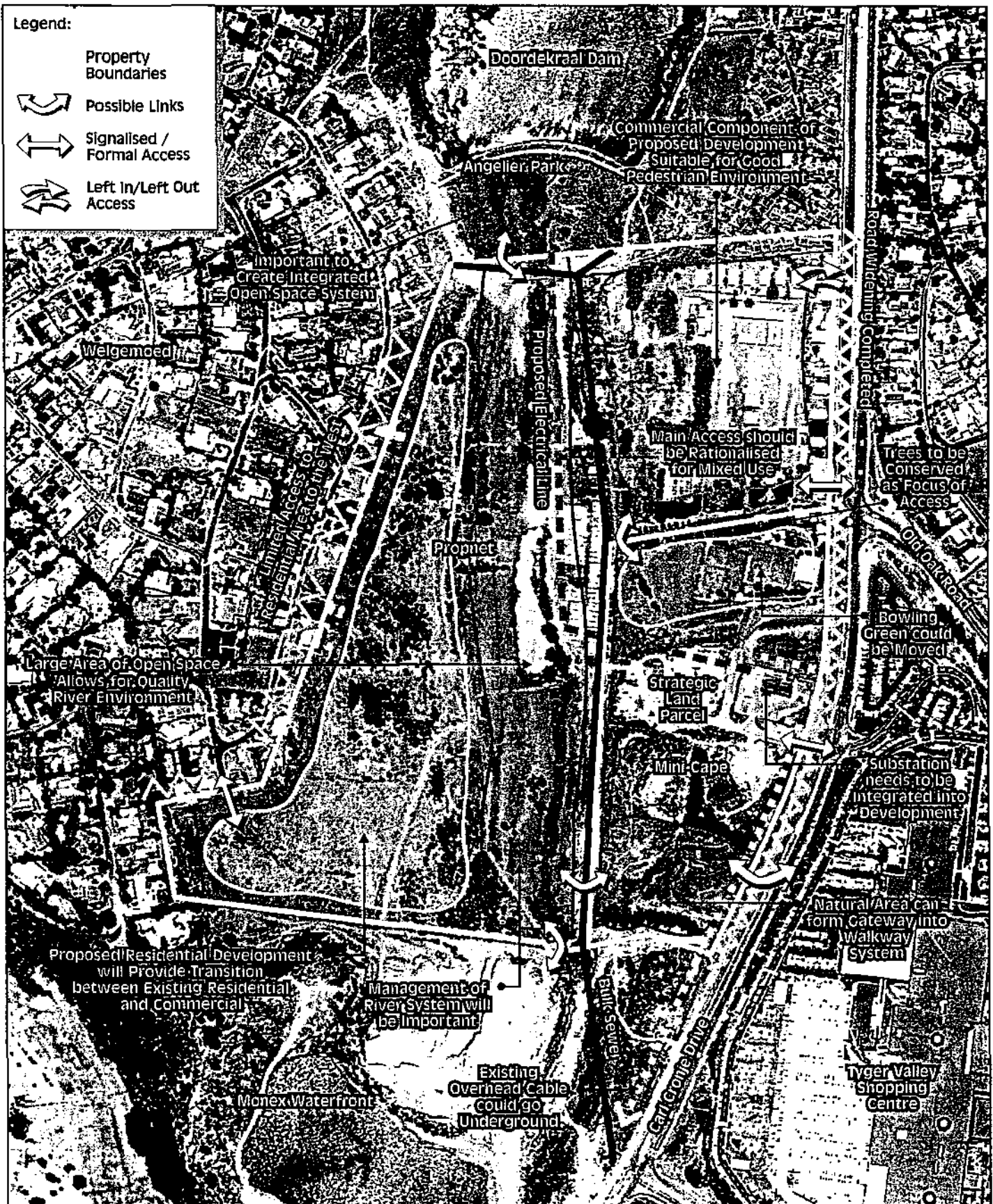


N.T.S

Figure 30c

Legend:

-  Property Boundaries
-  Possible Links
-  Signalised / Formal Access
-  Left In/Left Out Access



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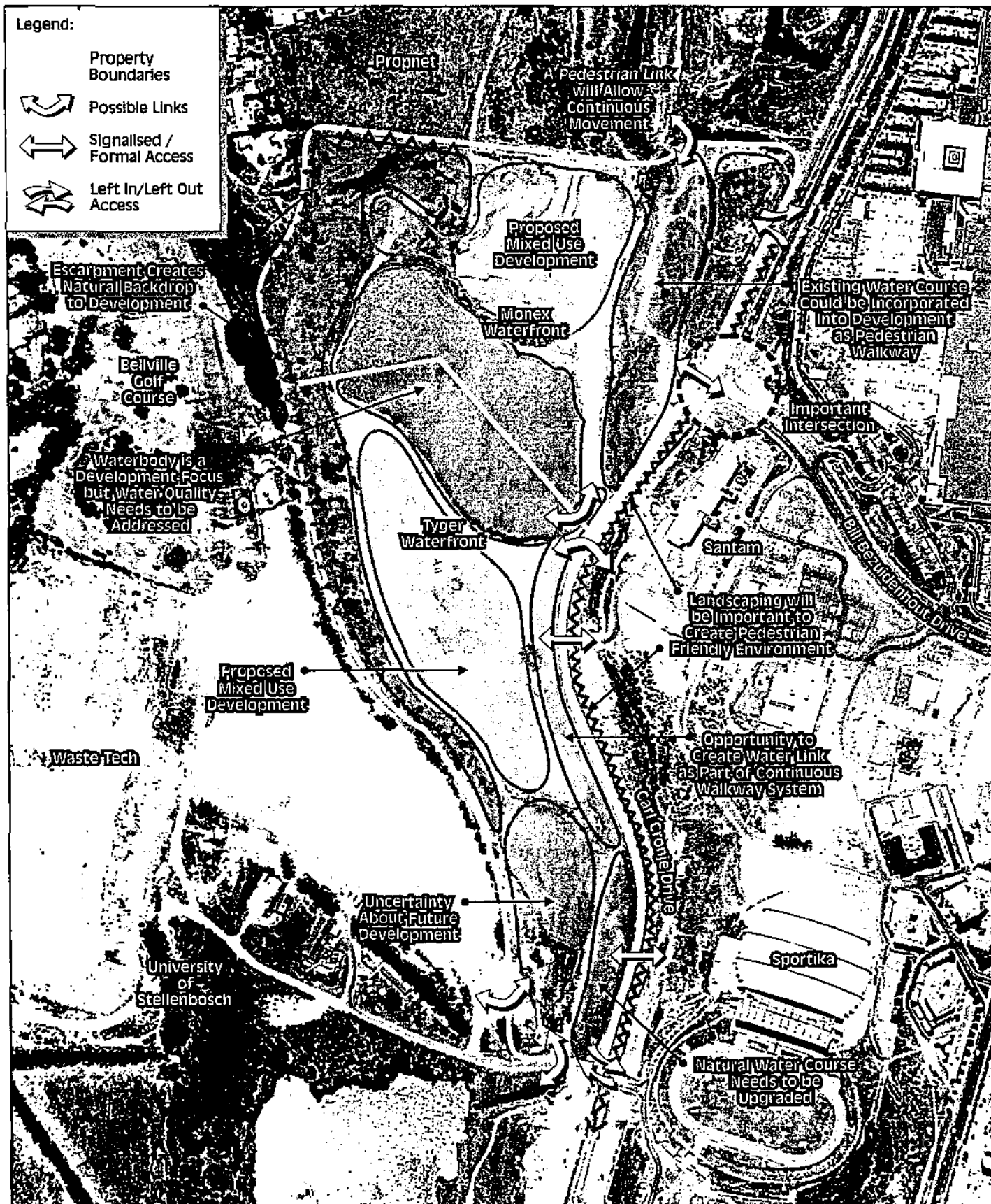
ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

Opportunities & Constraints:
Propnet & Mini-Cape

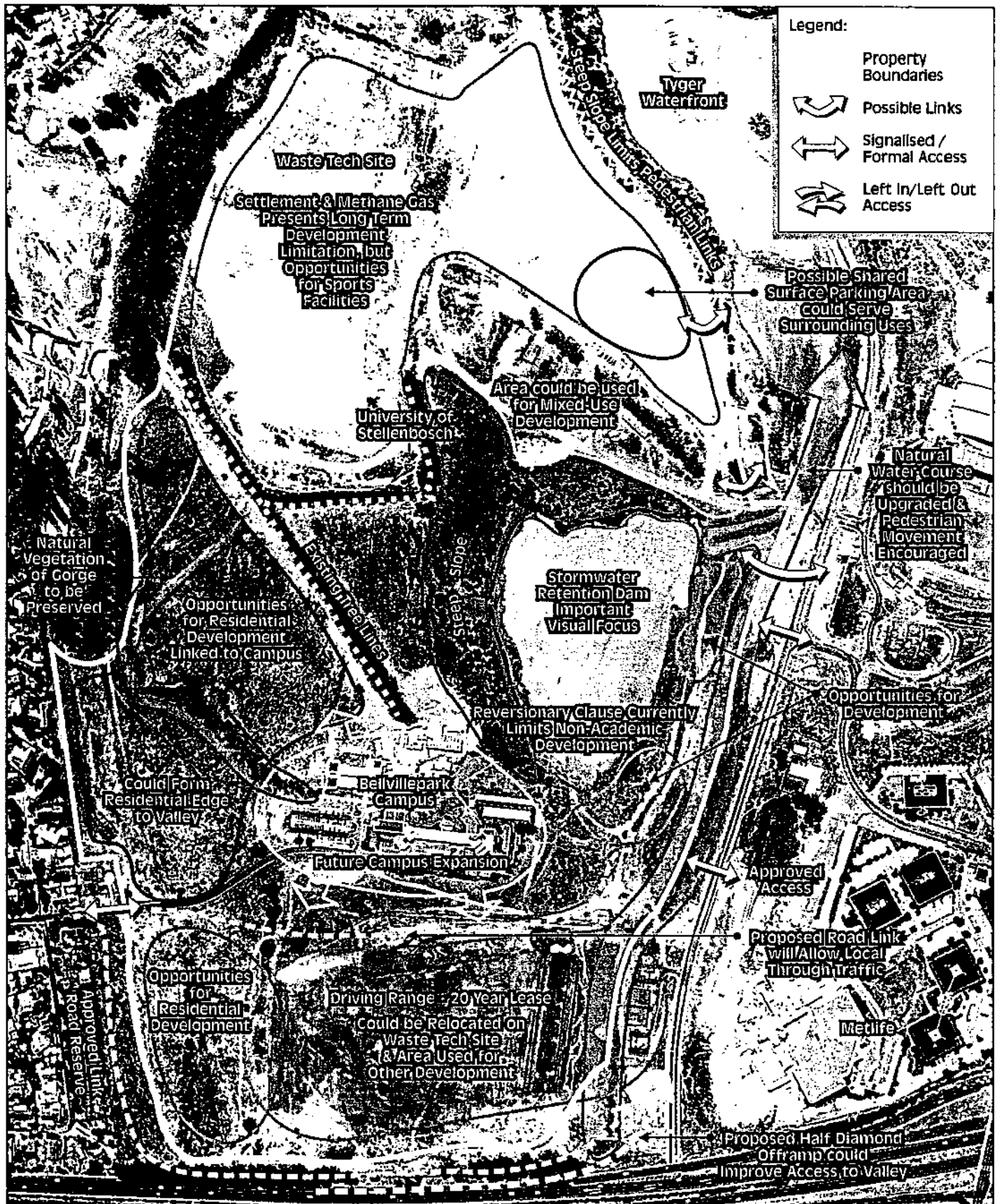


N.T.S

Figure 30d



 THE WATERFRONT TEAM	ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK Opportunities & Constraints: Monex & Tyger Waterfronts		N.T.S Figure 30e
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ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

Opportunities & Constraints:
University of Stellenbosch



N.T.S

Figure 30f

9.0 THE DEVELOPMENT FRAMEWORK

9.1 Vision for the Elsieskraal River Valley

It is worth noting the importance of a vision in city building. Neil Fraser of the Central Johannesburg Central Partnership cites a 1982 study in the United States which found that "a shared vision was among the essential characteristics of successful cities".

In the ERV this shared vision was identified at the November 1997 Indaba. The vision is that the "Elsieskraal River Valley becomes a major multi-purpose regional destination and a key building block in the financial base and identity of the new City of Tygerberg." Added to this, the Waterfront Team sees the ERV becoming a special environment highly suitable for office development. This development would need to capitalise on the attributes of the ERV identified in the preceding analysis, namely:

- a) Good accessibility to the metropolitan transportation network
- b) Close proximity to the international airport
- c) Sound local infrastructure
- d) An excellent range of existing services and facilities
- e) Availability of land and commercial/office development rights
- f) Close proximity to a growing residential population
- g) A unique natural setting and well-defined river system.

The Long Term Vision (Figure 31 and Figures 31 a, b and c) indicates how the above attributes could be enhanced for all users of the ERV study area.

9.2 The Development Framework Elements

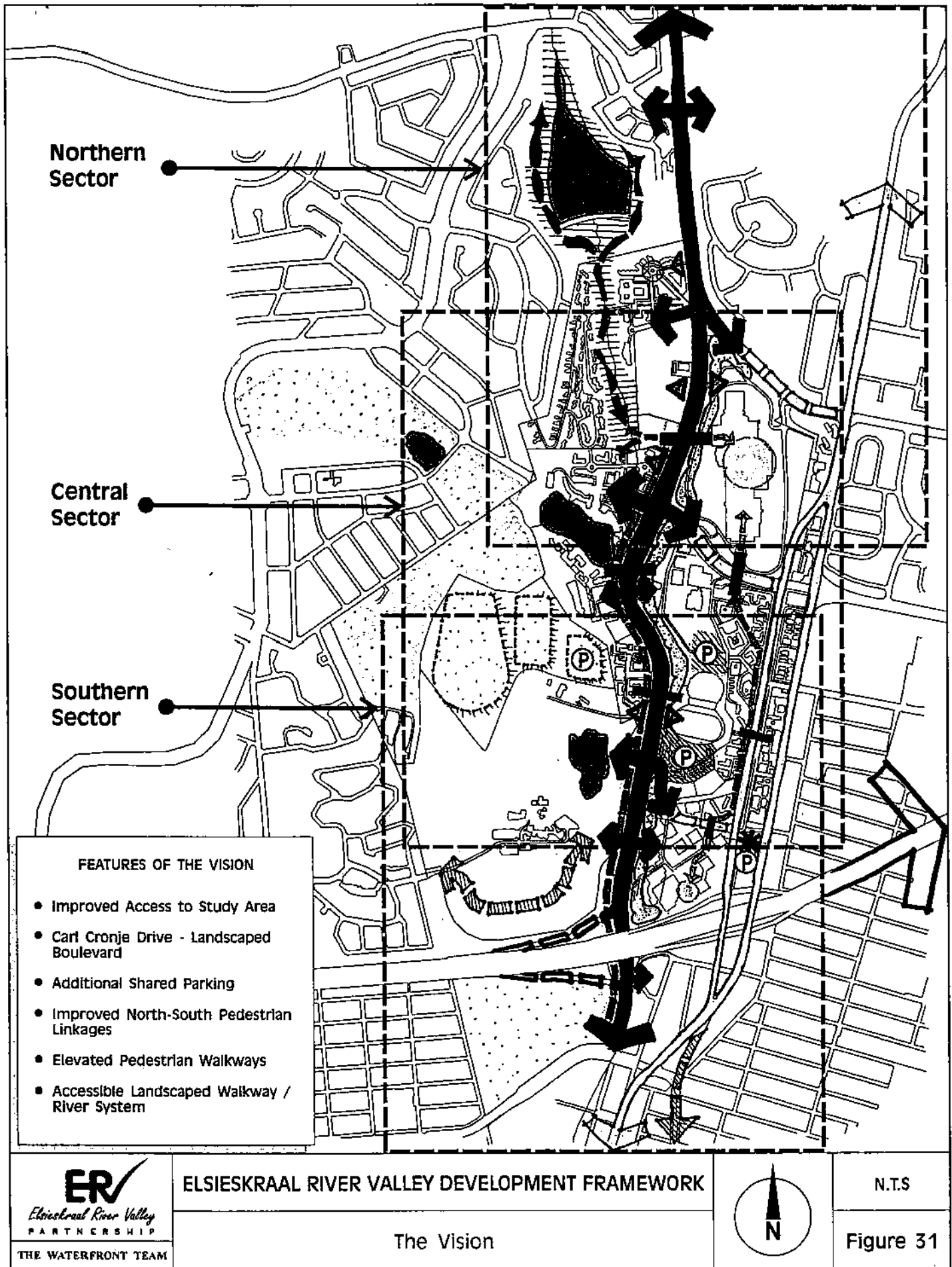
9.2.1 A Development Framework Plan

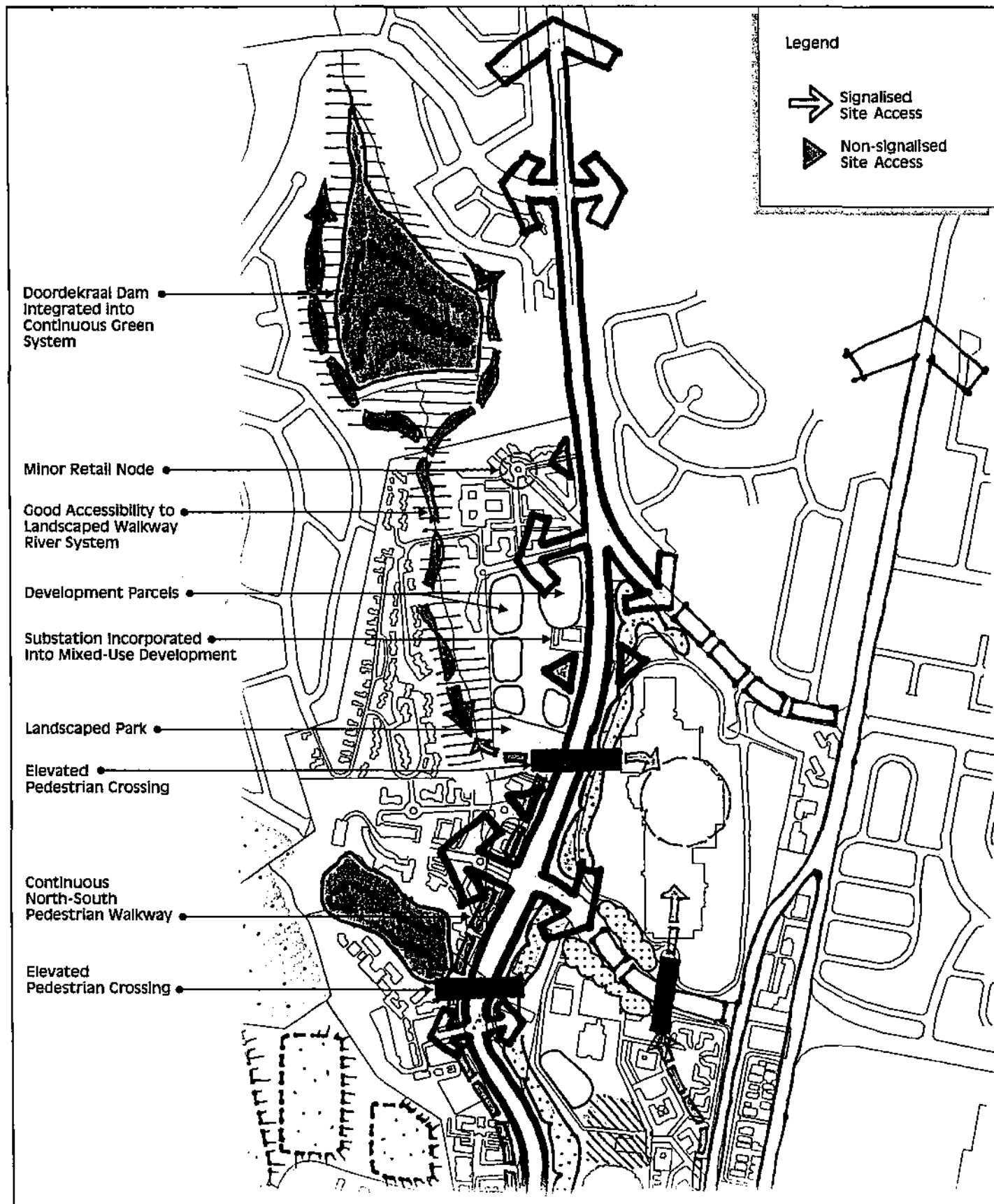
The concept of development framework planning emerged from the planning process adopted in the development of the Victoria & Alfred Waterfront. As part of the "Package of Plans" planning process, a Development Framework, unlike a fixed-state master plan, is the expression of procedures and development strategies to satisfy agreed-upon goals. The ERV Development Framework therefore, is primarily about goals and policies to guide development and the basic physical structure which organises the ERV study area and its links to its surroundings.

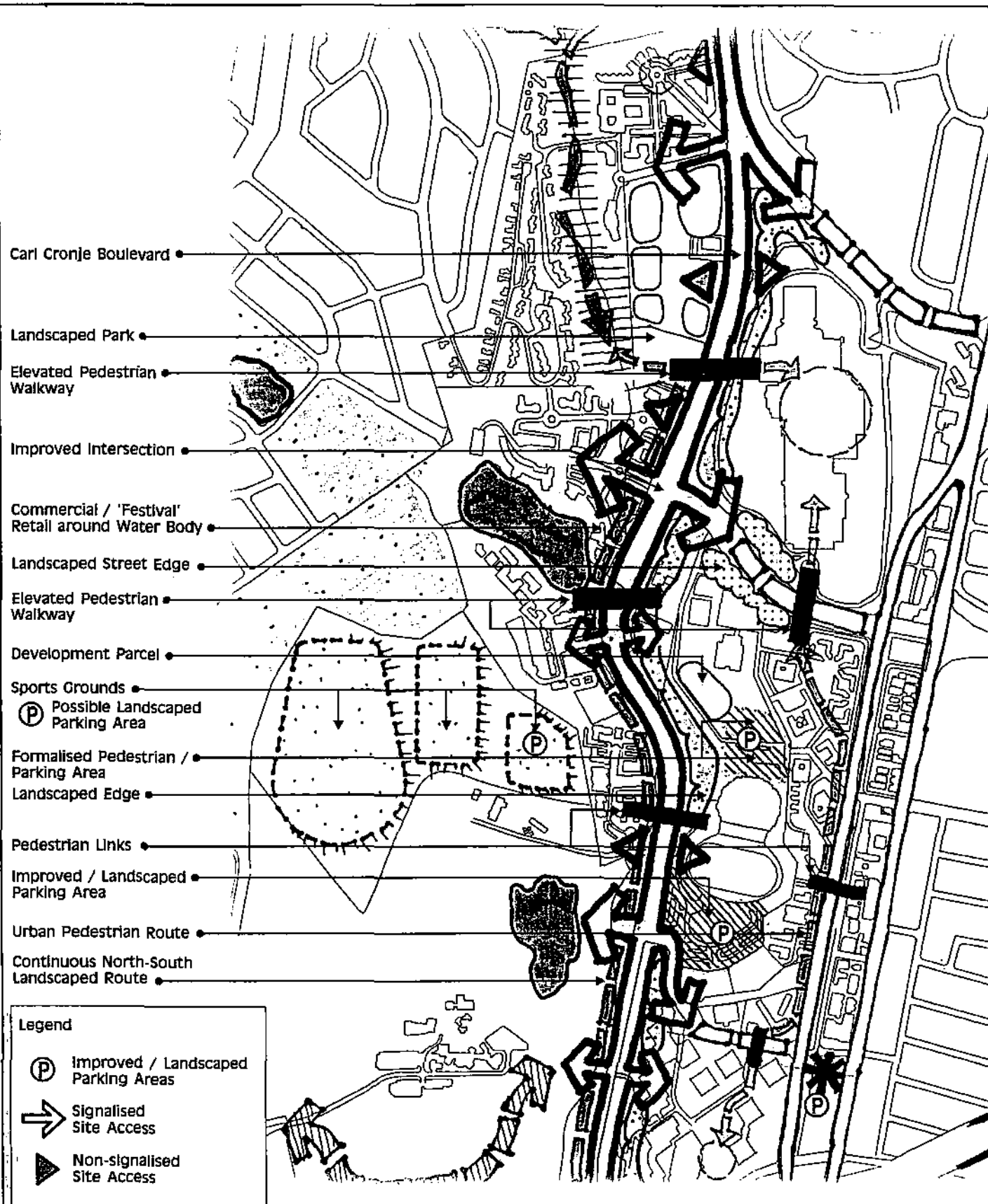
9.2.2 The Development Framework

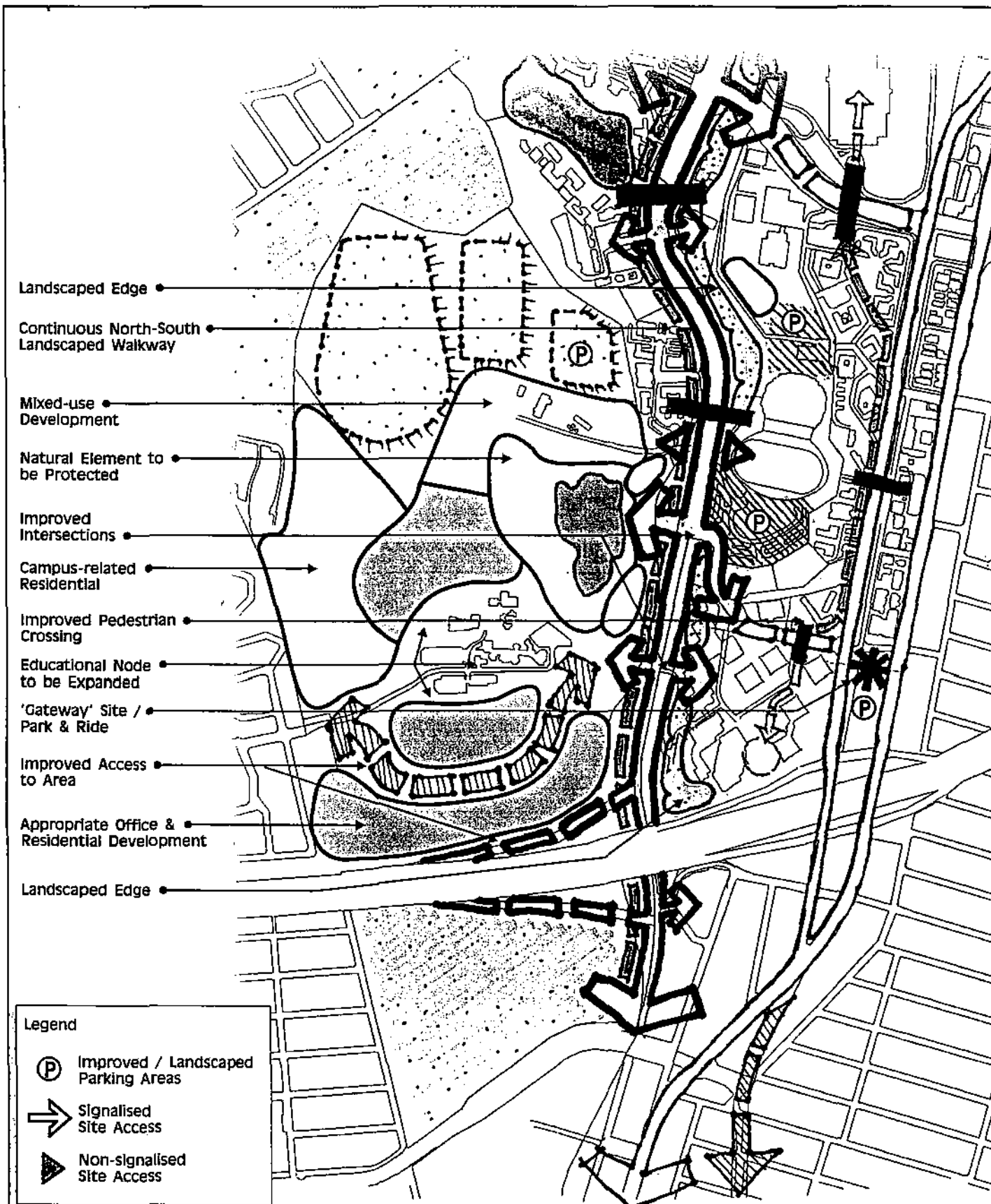
The Development Framework plan (Figure 32) is an indication of the key structuring elements which are seen as the pre-conditions for achieving development as identified in the Vision diagrams. These elements are:

- a) two north-south vehicular routes;
- b) three east-west connecting roads;
- c) two options, not mutually exclusive, for improving vehicular access to the study area;
- d) two different types of north-south pedestrian routes with at least one clearly defined east-west connection;
- e) an open space network which links the various natural forms and elements in the area; and
- f) 14 development precincts (Figure 33) with distinctive development objectives and functional requirements.



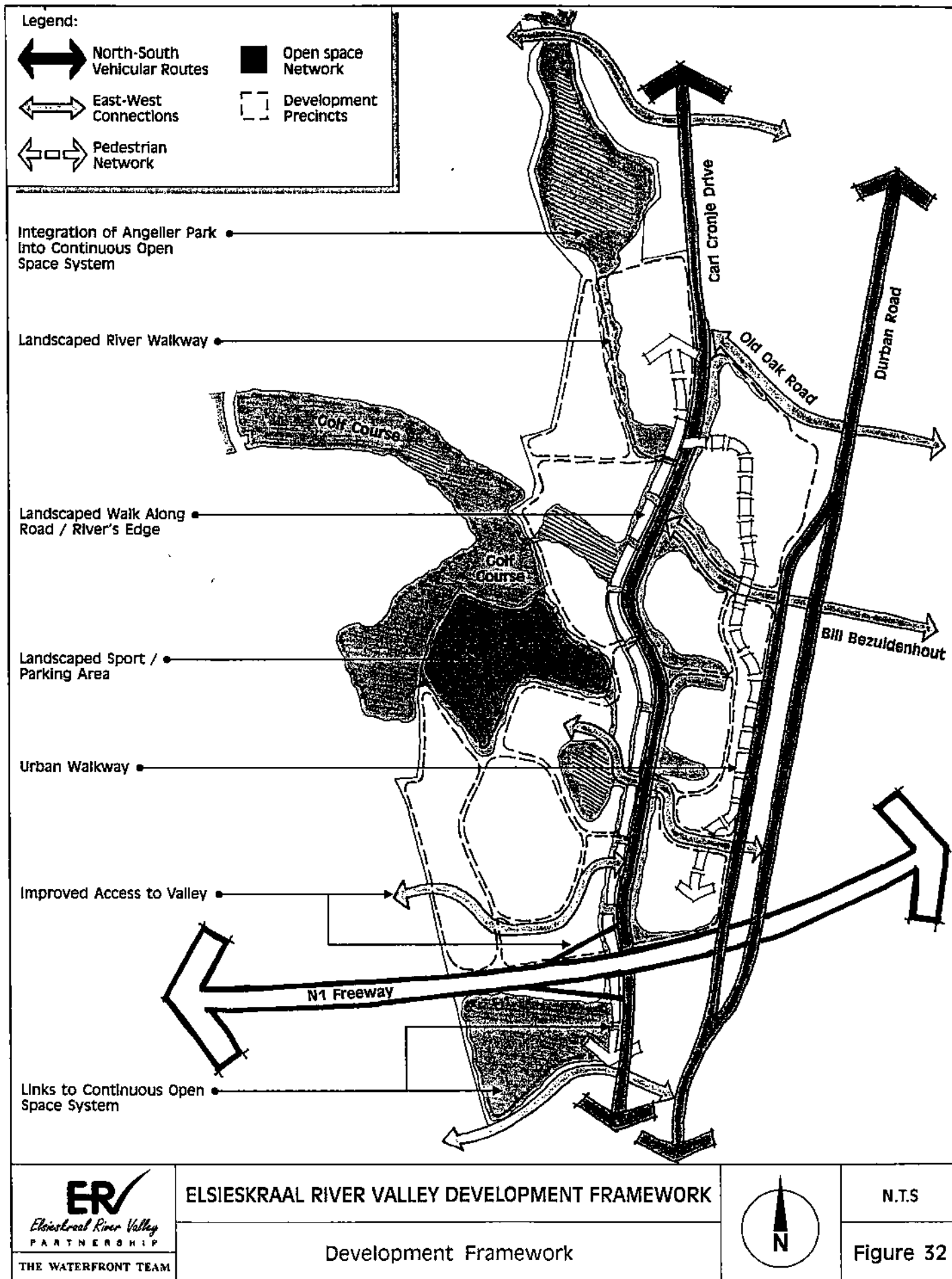


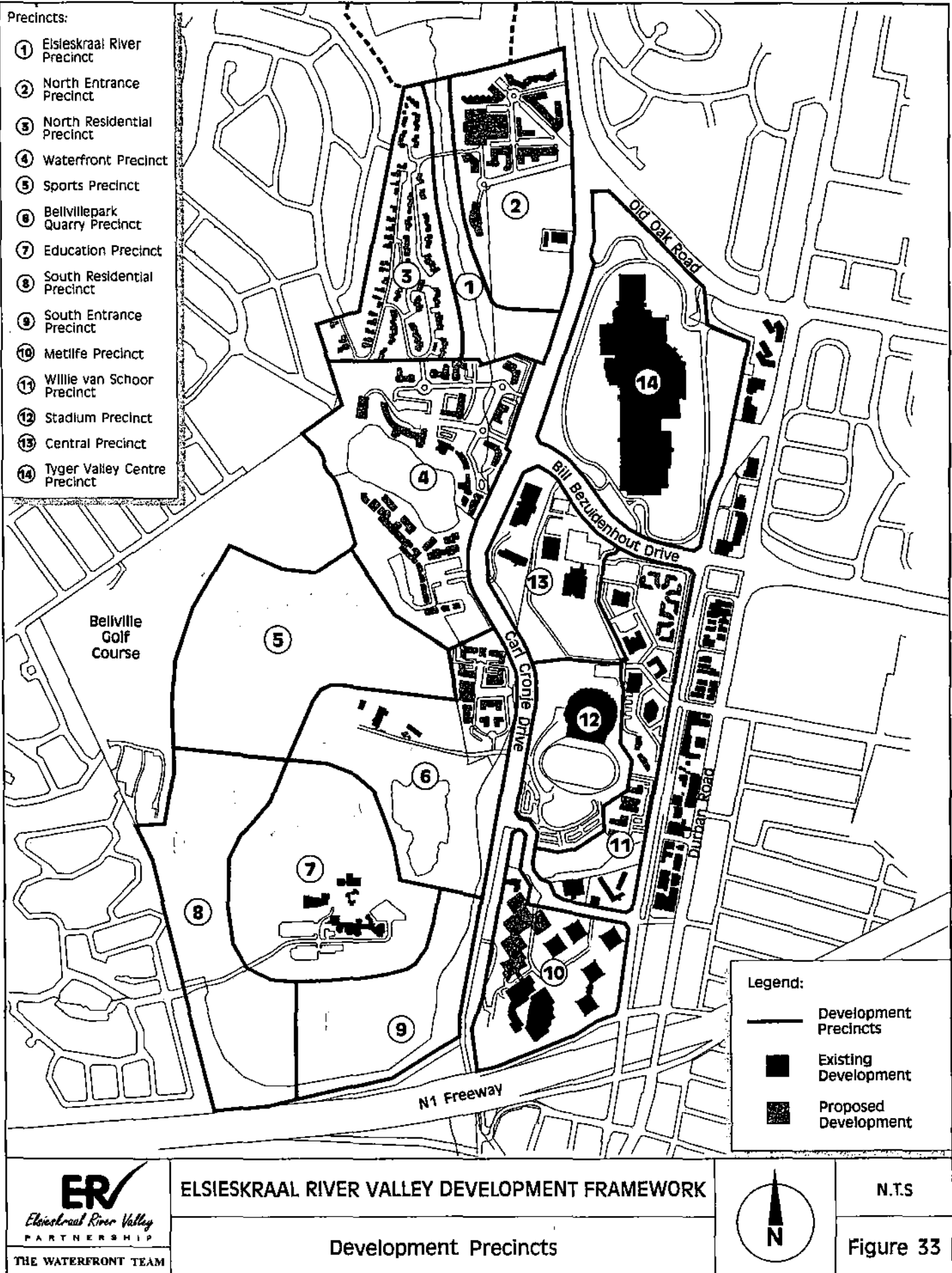




These physical elements must be considered and allowed for in the evaluation of any development proposals for the area. Such an assessment should apply to all precincts as all precincts would benefit from the organisation of the physical environment as indicated on Figure 32.

It is also the purpose of this report to indicate what measures are necessary in order for the above system to function optimally, efficiently, in a mutually reinforcing manner and towards achieving the visionary objectives of the ERV Partnership. These measures are elaborated on in the following policies which are intended to guide development and growth in the ERV for the next 20 years.





10.0 BULKING AND LAND USE PLAN

10.1 Development Bulk Scenarios

Table 3 is an indication of the additional rights which could be developed on three sites which do not have commercial development rights. These sites are the University of Stellenbosch and the City of Tygerberg's Mini-Cape and Sportika sites.

In assessing the potential rights on these sites the following factors were taken into account:

- a) The amount of developable land on each site.
- b) The amount of unutilised development bulk in the study area.
- c) Bulk factors for sites with approved development rights.
- d) The location of the site in terms of undeveloped land parcels.
- e) Parking requirements on site (see Table 3) and the amount of traffic generated from development on each site.

As the amount of traffic is considered a vital factor in the long term sustainability of the area, the impact of additional potential development rights on the existing road network was assessed. The traffic study concluded that the total amount of development bulk – 861 054 m² (Table 4) – to be developed in the ERV could be accommodated, albeit at diminished levels of service (Appendix B). The study also concluded that there would need to be:

- a) an improvement in access to the study area,
- b) control of the amount of through-traffic, and
- c) an increase in the use of public transport

In view of the amount of land required and costs involved for providing parking associated with future development (Table 5) it is imperative that all parties address issues such as the sharing of parking areas and public transport.

The ability to develop 370 498 m² of additional bulk is not only subject to the above transportation issues; it is also dependent on the demand for office and commercial space. Although broad projections over a 20 year period are possible (see section 15: Financial Analysis and Planning) a detailed assessment of take-up rates is beyond the scope of this study. However, it is possible that the amount of retail space available may exceed demand, particularly if the Tyger Valley Centre continues to trade successfully. For this reason it is recommended that commercial development rights could be interchanged with office rights.

The additional bulk figures in this report are indicative and are subject to standard rezoning applications which involve public participation.

10.2 Development Bulk Policies

- ◆ Permit additional development rights on University of Stellenbosch and City of Tygerberg land up to 370 500 m² subject to a detailed traffic impact assessment.
- ◆ In those precincts with existing retail development rights, permit office development instead of retail development subject to standard environmental, town planning and traffic considerations.
- ◆ Other than the sites identified above, rezoning applications for properties within the ERV which attract significant increases in commercial and/or office bulk should not be favourably considered by the City of Tygerberg.

Table 3 : Potential Rights - ERV Partners

Potential Rights : Bulk/GLA Analysis

Property/ Owner Name	Area	J&G Zone	Zoning	Total Erf Area (ha)	Average Bulk Factor for Site ¹		Average Bulk Factor Ratio per Use	Bulk Rights (m ²)	Utilised Bulk (m ²)	Available Bulk (m ²)	GLA Rights (m ²) ²	Utilised GLA (m ²) ³	Available GLA (m ²)
Sub-Tot : Existing Rights								606153	163540	442613	565782	171328	394454
Sportika -City of Tygerberg	6	27,29	Private Open Space		0.15	O:	0.11	16720	0	16720	14212	0	14212
						B:	0.04	0		0	0	0	0
Mini Cape - Tygerberg	9	50	Undetermined		0.60	O:	0.24	17424	0	17424	14810	0	14810
						B:	0.24	17424	0	17424	14810	0	14810
						R:	0.12	8712	0	8712	8712	0	8712
Stellenbosch- Education	13		Waste Tech										
	14	101	Education		0.60	E:	0.27	151625	0	151625	128881	0	128881
					0.33	O:	0.09	54540	0	54540	46359	0	46359
					0.24	B:	0.03	18180	0	18180	15453	0	15453
					0.21	R:	0.21	127260	0	127260	127260	0	127260
Sub-Tot : Additional Rights								411885	0	411885	370498	0	370498
TOTAL								1018038	163540	854498	936280	171328	764952

1. Where no bulk factor was available, an average for the approved bulk rights was used. For consistency, total site area was used for the calculation

2. GLA has been calculated at 85% of total floor area where no information was available, except the Tyger Valley Centre that received a broader definition for GLA

3. GLA has been calculated for office and business only

4. Where a mix of office and retail is possible, a 50/50 ratio is assumed.

O: Office
B: Business
R: Residential
E: Education

Table 3 : Potential Rights - ERV Partners

Potential Rights : Parking Analysis

		Parking Bays Required to GLA Rights ⁵	Parking Bays Required to Utilised GLA	Existing # of Parking Bays	Existing Shortfall/ Surplus	Future # of Parking Bays ⁶	Total # of Bays on Site	Total Shortfall/ Surplus	Existing # of People ⁷	Future # of People	Total Number of People	Comments
Sub-Total : Existing		24390	8443	8364	-79	16723	25087	696	7790	13836	21625	Totals include development on Sportika & Stellenbosch
Sportika - Tygerberg	O:	568	0	0		568	568		0	597	597	Assuming an office development
	B:	0	0	0		0	0		0	0	0	Leased areas included in existing rights
Mini Cape - Tygerberg	O:	592	0	0		592	592		0	622	622	No current rights, part being leased for bowling greens
	B:	889	0	0		889	889		0	592	592	Assuming a mixed-use development
	R:	144	0	0		144	144		0	216	216	Number of units : 72
Stellenbosch- Education												Development will be limited to sports facilities
	E:	2515	0	0		2515	2515		0	5967	5967	Assignable m ² (ASM) = GLA
	O:	1854	0	0		1854	1854		0	1947	1947	Assuming a mixed-use development
	B:	2782	0	0		927	927		0	1854	1854	Mainly on eastern portion of property
	R:	1650	0	0		1650	1650		0	2475	2475	Number of units: 825
Sub-Total : Additional		10984	0	0	0	9140	9140	0	0	14271	14271	
TOTAL		35374	8443	8364	-79	25863	34227	696	7790	28106	35896	

5. Parking ratios calculated at : Office - 4 bays/100 m² GLA; Retail - 6 bays/100 m² GLA; Residential - 2 bays per unit; 1 bay per 2.5 students.

6. Parking bays required for development of available bulk

7. Occupant numbers calculated at : Office - 42/1000 m² GLA; Retail - 1/25 m² GLA; Residential - 3 people per unit.

O: Office
B: Business
R: Residential
E: Education

Table 4 : Summary Table - Development Rights

Area	Bulk Rights (m ²)	Utilised Bulk (m ²)	Available Bulk (m ²)	GLA Rights (m ²)	Utilised GLA (m ²)	Available GLA (m ²)	% of Total GLA Rights
ERV PARTNERS - CURRENT RIGHTS	606153	163540	442613	565782	171328	394454	49
DURBAN ROAD CORRIDOR	112084	61327	50757	95271	52127	43143	8
OTHER DEVELOPMENT RIGHTS	127481	65176	62305	108359	55399	52959	10
ERV PARTNERS - POTENTIAL RIGHTS	411885	0	411885	370498	0	370498	33
TOTAL	1257603	290043	967560	1139910	278854	861054	100

% of GLA Rights Utilised
30
55
51
0

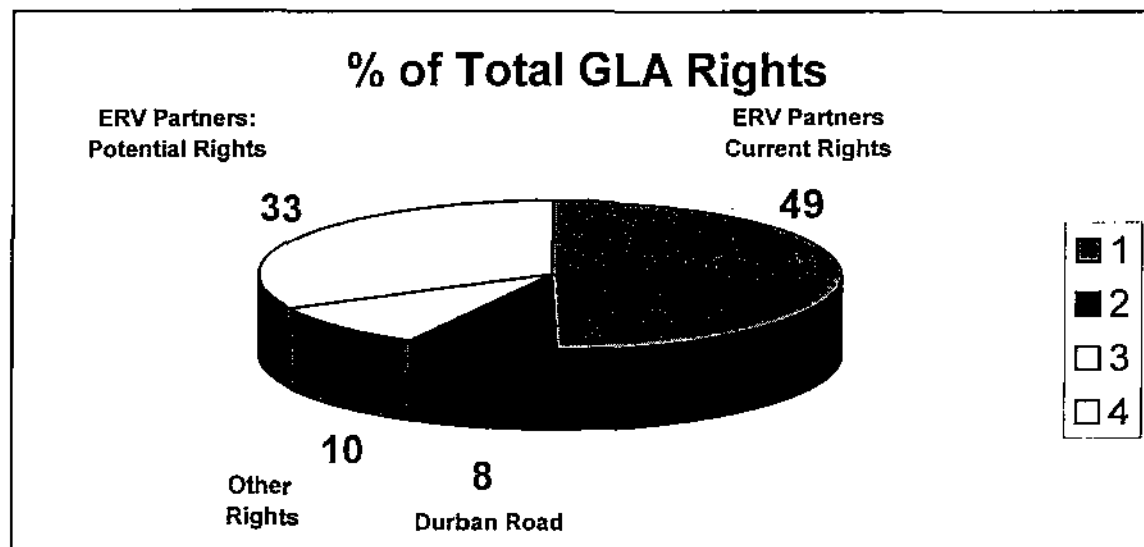
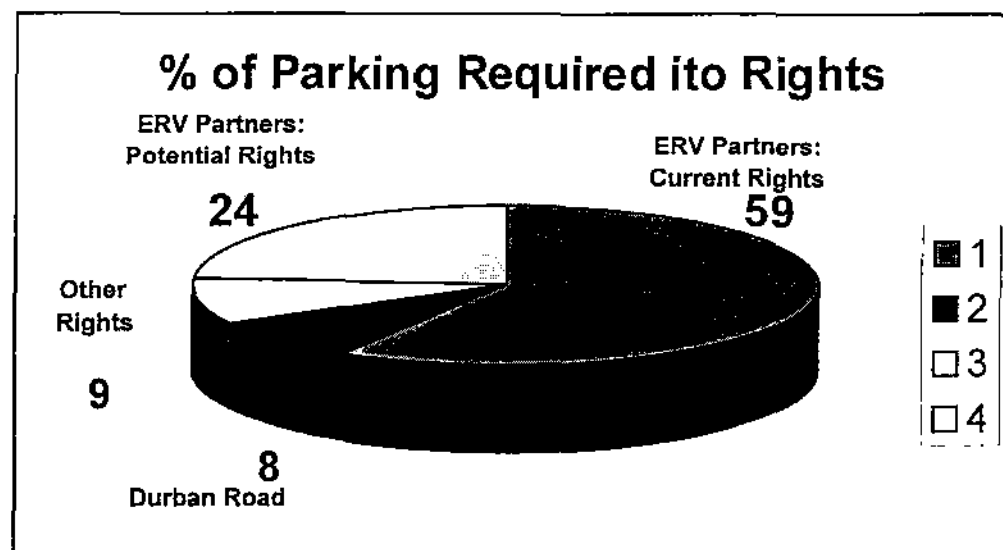


Table 5 : Summary Table - Parking Requirements

Area	Parking Required to Rights	Parking Required to Utilised Rights	Existing # of Parking Bays	Existing Shortfall/ Surplus	Future # of Bays on Site	Total # of Bays on Site	% of Total Bays Required to Rights
ERV PARTNERS - CURRENT RIGHTS	26905	8443	8364	79	19238	27602	59
DURBAN ROAD CORRIDOR	3811	2085	1748	-337	1725	3473	8
OTHER DEVELOPMENT RIGHTS	4177	2156	2082	-74	1920	4002	9
ERV PARTNERS - POTENTIAL RIGHTS	10994	0	0		9140	9140	24
TOTAL	45887	12684	12194	-490	32023	44217	100

% of Future Parking Bays
59
8
9
24
100

1450 Additional On-street, Sportika & Informal Parking Bays



10.3 Land Use Plan

Figure 34 provides an indication of the primary land uses which have occurred/will occur in the context of approved/potential development rights.

Apart from the University of Stellenbosch, Mini-Cape and Sportika sites, development proposals for all vacant sites in the ERV have been submitted to the City of Tygerberg for consideration and/or approval. The above three sites represent over 70 ha of land without approved commercial/office development rights; confirmation of the planning of these sites would complete the long term development scenario for the ERV. With a clearer scenario, it will be easier for development proposals to complement and reinforce one another and thereby contribute to the long term sustainability of the ERV. In support of this objective, the following observations are made:

a) University of Stellenbosch

At the time this land was purchased it was for the intention of developing a University Campus for ± 21 000 students and therefore no commercial rights were required. However, now that the projected size of the student population has been substantially reduced, there is a vast amount of land which is not required for educational purposes. To leave this land vacant because of historical agreements is not in the interest of the ERV. Therefore, it is recommended that the agreement which allows for City Council to regain ownership of the land should it not be used for educational purposes, i.e. the reversionary clause, be evaluated with a view to permitting a range of uses on University land.

b) The City of Tygerberg's land which does not have specified development rights, i.e. the portion of the Sportika site north of the Velodrome may be more appropriate for office development than as public open space. With regard to the Mini-Cape site, it is recommended that because of the success of the Tyger Valley Centre and the potential increase in land value of the Mini-Cape site, the City of Tygerberg could facilitate the development of the site for commercial/residential purposes whilst realising funds for broader community needs.

Therefore, with regard to outstanding issues on land with no commercial/office development rights, the following issues require resolution:

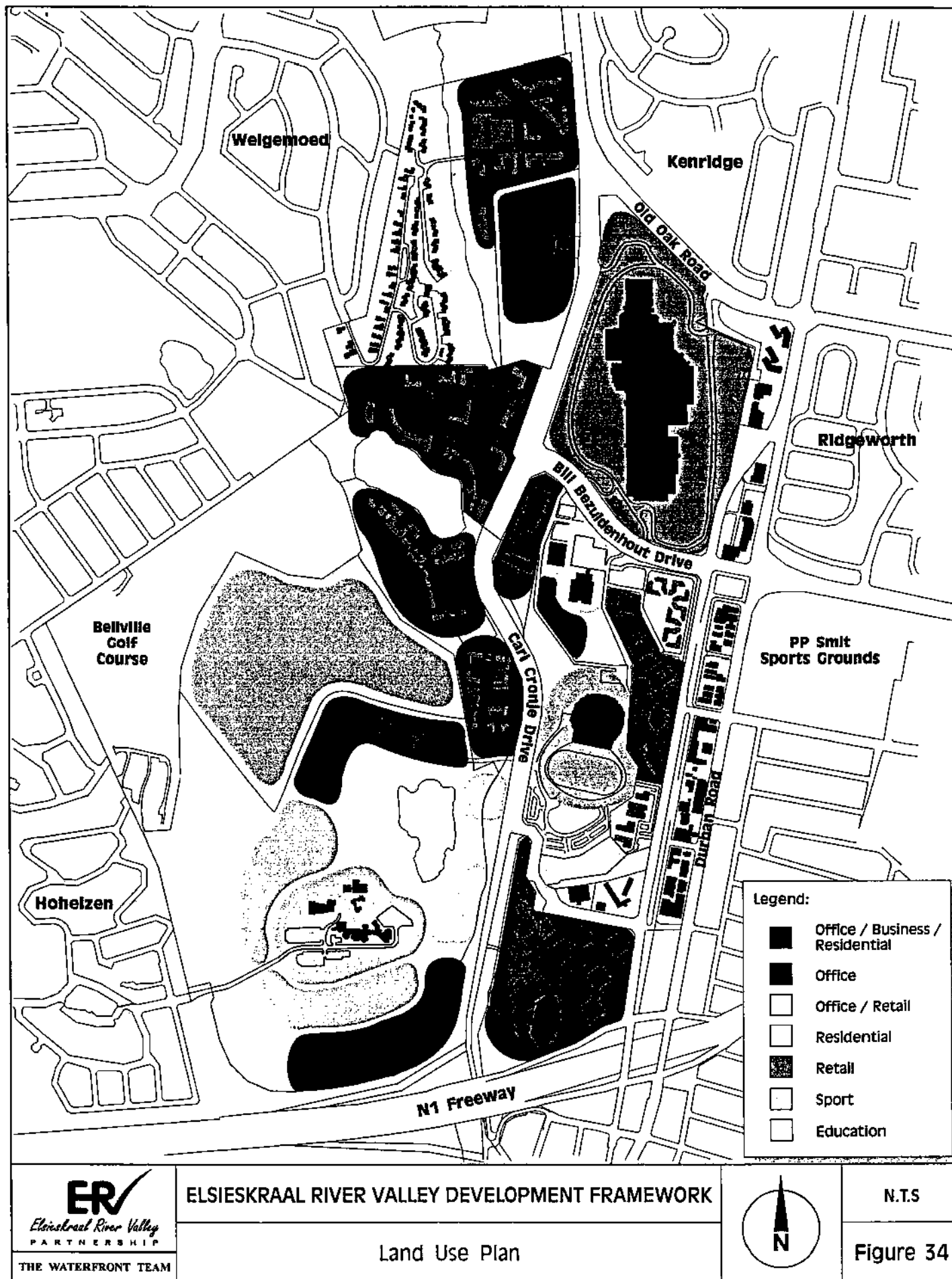
i) The reversionary clause applicable on the University's land. Permission for a lease such as the Golf Driving Range indicates that the University should be allowed to pursue commercial development on land not required for educational purposes. However, because of the conditions of the original purchase, the University should not alienate land before reaching agreement with the City of Tygerberg on land use and development controls.

As the Golf Driving Range site enjoys good visibility from the N1 and in the future could have good access from the N1, the University should be permitted to develop this site for commercial purposes subject to dealing with the existing lessee.

ii) The bowling greens on the Mini-Cape site. This facility is considered to be an amenity to the area and should be retained within the ERV. Therefore, if the site is to be developed for commercial or residential purposes, an alternative site for the bowling greens should be found within the ERV. The relocation of the bowling greens would enable the City to enter into negotiations with potential developers for the Mini-Cape site.

10.4 Land Use Policies

- ♦ Achieve a rich and diverse urban environment by promoting a balanced and reinforcing mix of activities.
- ♦ In order to promote the long term economic sustainability of the ERV, the development precincts should be integrated through the use of pedestrian and vehicular linkages.
- ♦ The withdrawal of the reversionary clause should be negotiated between the University of Stellenbosch and City of Tygerberg in order to develop the university land for a mix of education, residential, offices and commercial purposes.



- ♦ The benefits of developing the existing Golf Driving Range site for commercial use should be assessed.
- ♦ The amount of land on the Sportika site north of the Velodrome which could be released for development should be assessed. This development should complement and reinforce the Velodrome, such as an office development, conference facilities, a training academy or hotel.
- ♦ Develop the Mini-Cape site to its full potential subject to
 - a) developing an alternative site for the Bowling Club;
 - b) a detailed financial assessment of the potential benefits for the City of Tygerberg; and
 - c) recommendations on implementing an open space network as indicated in this Development Framework.
- ♦ Higher density residential development should form the transition between the ERV and the lower density residential areas to the west and south.

11.0 PUBLIC SPACE & URBAN DESIGN FRAMEWORK

The intention of an urban design framework is to provide coherence to a series of seemingly unrelated open spaces. In this manner the public and private realm can be clearly defined in terms of expectations and responsibilities. The elements which shape the public environment and the experience of people moving through the system are indicated on Figures 35.

11.1 Design Objectives

The principle objective of the public space and urban design framework is to provide sensible linkages between major open spaces and important natural elements. These linkages should reinforce existing movement patterns and in undeveloped areas, should take cognisance of topography and views. It is important that appropriate uses on private land also be part of an open space network; the interface between the open space network and private land will require special attention.

In terms of the framework there are two distinct north-south pedestrian walkways. The route along Carl Cronje Drive is a route which will have strong natural features but will also be formally landscaped in places. The design of this route should allow for jogging tracks as well as formal pause areas. In contradistinction, the north-south route along Willie van Schoor Drive is chiefly a "mobility" route and should be designed to provide safe pedestrian access through parking areas and local access roads.

The open spaces in the public realm vary in size and function, but should be accessible off the major pedestrian routes. Whilst the area to the south of the Bellville Stadium is essentially a large parking lot, it could be used for more public events and therefore should be easily accessible from Carl Cronje Drive.

A key open space within the network is the Mini-Cape site. This site is an important interface between the hard/commercial areas of Carl Cronje Drive and the natural areas of Elsieskraal River. As such it should form a "forecourt" to the natural system. Therefore its links north-south and east-west are important to the integrity of the open space network.

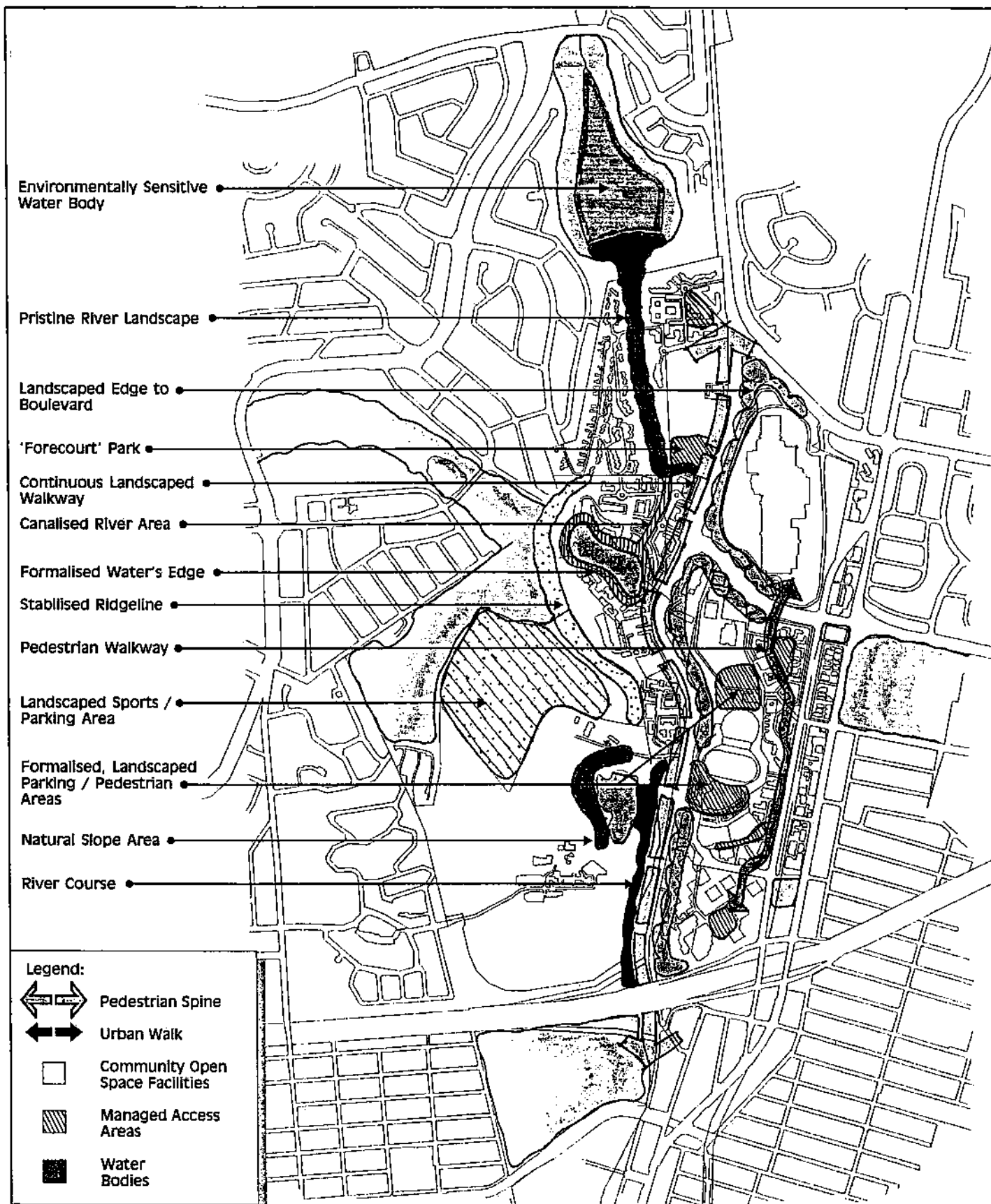
Roads are also considered to be part of the open space network and consequently their attendant environment should also positively contribute to the public's experience of the place. For this reason it is recommended that the edges of Bill Bezuidenhout Drive, an important access route to the future Monex Waterfront Development, be appropriately landscaped.

The enhancement of the public open space environment is seen as critical to the identity of the ERV and its long term success. It is therefore important that the implementation of the design objectives and policies of the open space network be pursued by all members of the ERV partnership.

11.2 Public Space Policies

In order for the physical elements of the framework to inform future development in the area, the following policies need to be adopted:

- ♦ The creation of a network of publicly-accessible urban spaces of varying character and size and that relate to the adjacent land uses and activities, should be encouraged.
- ♦ A continuous landscaped public pedestrian walkway should be developed along the entire length of the western edge of Carl Cronje Drive and where appropriate, incorporate the river course itself as the main defining element.
- ♦ Development on private land to the west of this walkway should be encouraged to permit access off this walkway and the river system at designated points.
- ♦ Parking areas and access roads in developments flanking Willie van Schoor Drive should allow for a safe north-south pedestrian route.



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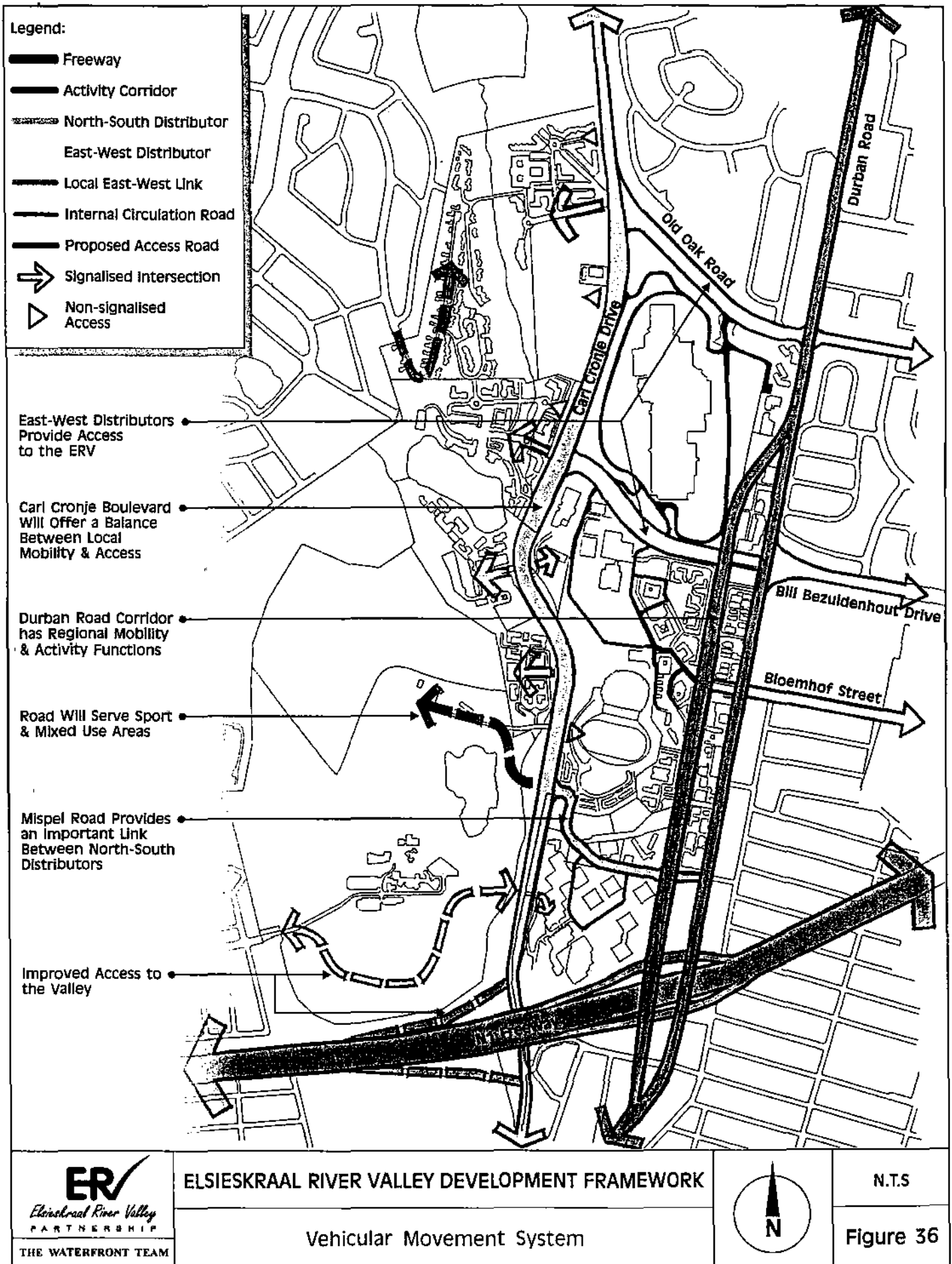
ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

Open Space Network



N.T.S

Figure 35



- ◆ The parking areas to the north and south of the Velodrome/Bellville Stadium should be developed into multi-functional public spaces.
- ◆ Public areas should be planned and designed to ensure safety, management and control. This includes adequate lighting and visibility.
- ◆ The technical and financial feasibility of building elevated pedestrian bridges across Bill Bezuidenhout Drive and Carl Cronje Drive should be investigated.
- ◆ The southern portion of the Mini-Cape site should be designated as public open space and allow for related tourist and leisure facilities.

11.3 Urban Design Policies

- ◆ Development and land uses along the Elsieskraal River should contribute to the continuity of the public walkway system.
- ◆ Opportunities to create defining urban elements on appropriate sites such as landmark buildings, spaces and features should be explored.
- ◆ Views and vistas should inform and guide building location and height.
- ◆ The natural features of the Valley, i.e. the Elsieskraal River and escarpment should inform the location, scale and height of buildings.
- ◆ The orientation and scale of buildings should relate to the public environment.

12.0 MOVEMENT & PARKING FRAMEWORK

The overall movement system for the study area is indicated on Figure 36.

12.1 Accessibility

The vehicular movement characteristics of the Durban Road Corridor and Carl Cronje Drive are described in Section 7. With the amount of development proposed, it is envisaged that the function of Carl Cronje Drive will change from being chiefly a mobility route to a route which offers a balance between local mobility and sub-regional access. The mobility function of this route will be affected by the additional signalised and non-signalised intersections which will become operational under a full development scenario.

Access to the study area is dealt with in Appendix B. In view of the amount of through-traffic which is already affecting the area, it is evident that additional access into the ERV could be beneficial to its long term sustainability. For this reason it is recommended that final resolution be made on the N1 off-ramp and/or the access route from Hoheizen to Carl Cronje Drive.

12.2 Parking and Public Transport Plan

Proposals for managing parking and the organisation of a public transport system are indicated on Figure 37.

In order to address the shortage of parking in the future and the wastage of space by providing use of site specific parking, it is recommended that the following sites be utilised as shared parking areas:

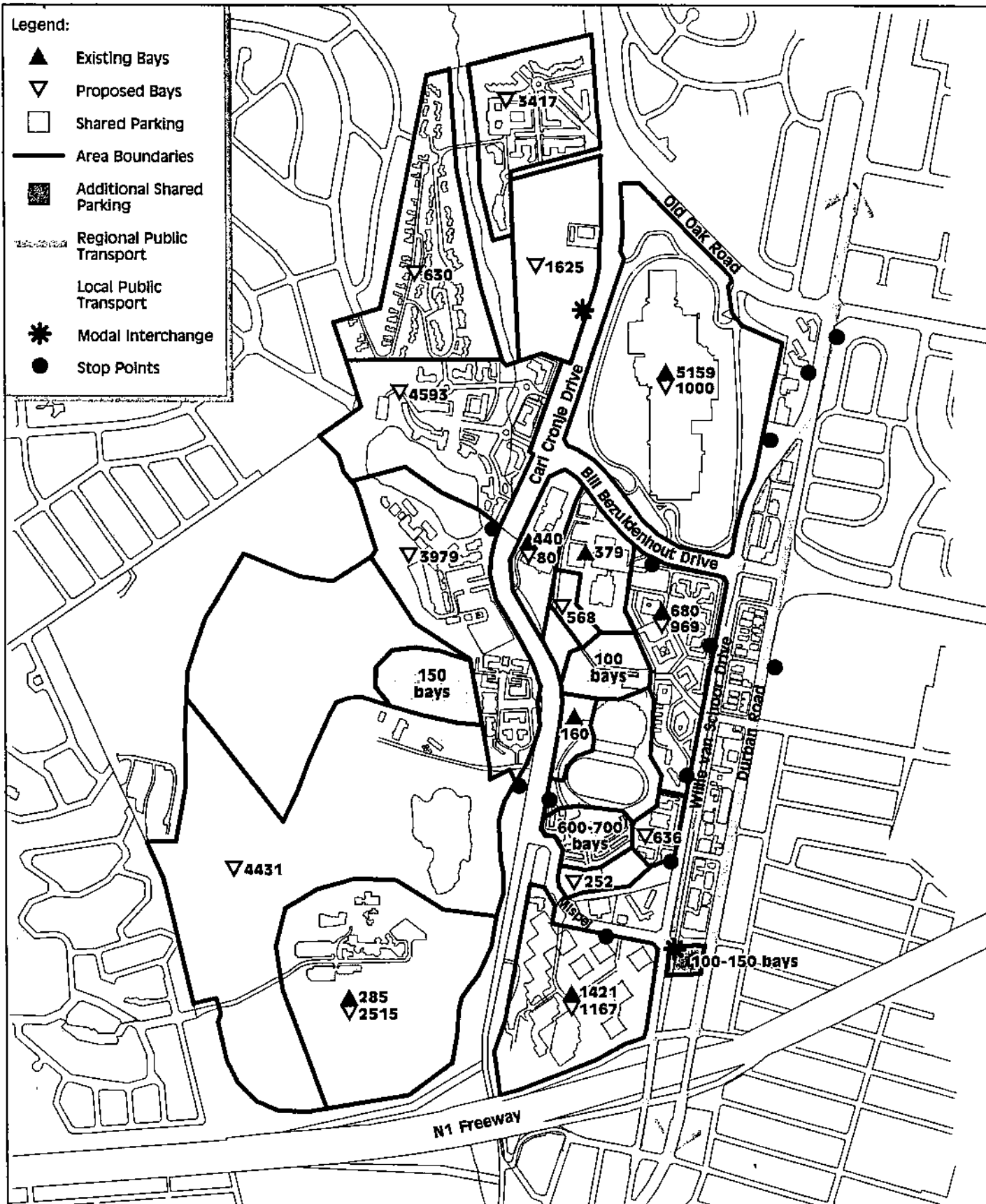
- a) existing parking area south of the Bellville Stadium; to be supplemented by structured parking on site;
- b) a site north of the Velodrome;
- c) the lowest portion of the Waste-Tech site in combination with other uses such as sports and/or recreation facilities; and
- d) the existing PAWC site at the southern entrance to the study area; this area is already used for parking. It needs to be formalised in conjunction with a proposal to allow for a public transport facility.

The Durban Road Corridor is seen as the regional public transport route between the residential areas to the north and the N1 and station to the south. Within the study area, it is intended that a local public transport system should operate. This system would also contribute to the integration of development parcels east and west of Carl Cronje Drive.

12.3 Movement and Parking Policies

The policies for access, parking and public transport are based on the aforementioned possible developments.

- ◆ Improvements to the network in the East Service Area of the City of Tygerberg, which will alleviate the negative impacts of through-traffic in the ERV, should be identified and implemented.
- ◆ The individual development proposals which require an increase in bulk, changes to land-use and/or changes in access arrangements should be evaluated in conjunction with detailed traffic impact assessments.
- ◆ Well-located parking areas which can be shared between ERV Partners, should be developed.
- ◆ The technical and financial feasibility of developing a parking facility to address the shortage of parking on the Durban Road Corridor should be investigated; such a development would be subject to a traffic impact assessment.



THE WATERFRONT TEAM

ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

Parking Management & Public Transport Plan



N.T.S

Figure 37

- ◆ A public transport system within and to the study area from Bellville CBD should be promoted as part of the long term transportation improvements in the ERV and East Service Area.
- ◆ The cost calculations of the N1 half-diamond and access road from Hoheizen should be updated and the technical and environmental aspects should be evaluated by the City of Tygerberg prior to engaging with the appropriate authorities to obtain approval for these proposals.

13.0 LANDSCAPING & GREENING FRAMEWORK

The landscaping and greening framework (Figure 38) highlights the important landscaping elements required to improve the public environment in the ERV and strengthen the structuring elements of the development framework.

13.1 Landscaping Principles

The following principles form the basis of the landscaping and greening framework:

- Strengthen the natural features such as Elsieskraal River, amphitheater, topography and ridgelines;
- Integrate the different land parcels and activities through appropriate planting and landscaped links;
- Enhance the public environment through both hard and soft landscaping;
- Strengthen the structuring elements, such as pedestrian walkways and roadways through appropriate planting;
- Create a quality, pedestrian-friendly environment which is safe and allows various activities and experiences; and
- Create a sense of place by providing a unique and legible environment for residents, workers and visitors to the area.

A combination of hard and soft landscaped areas will be linked by means of the proposed pedestrian system. Landscaping along the north-south pedestrian spine should strengthen the natural and canalised waterways and allow for both active and passive uses and spaces. This entails the provision of street furniture such as benches, lighting, litter bins and other facilities along the pedestrian pathways and cycling tracks.

The area to the east of Carl Cronje Drive should be treated differently as it is more steeply sloping and will be less frequented by the public. However, it is an important visual element along Carl Cronje Drive; the landscaping should also offer the passer-by a feeling of openness in a built-up area.

Where there are natural areas in good condition, there should be minimal intervention. However, provision should still be made for public pedestrian access.

Appropriate lighting and street furniture should also be provided at other open space areas such as the urban walk, the landscaped park on the Mini-Cape site and the formalised open spaces north and south of the Velodrome and Bellville Stadium.

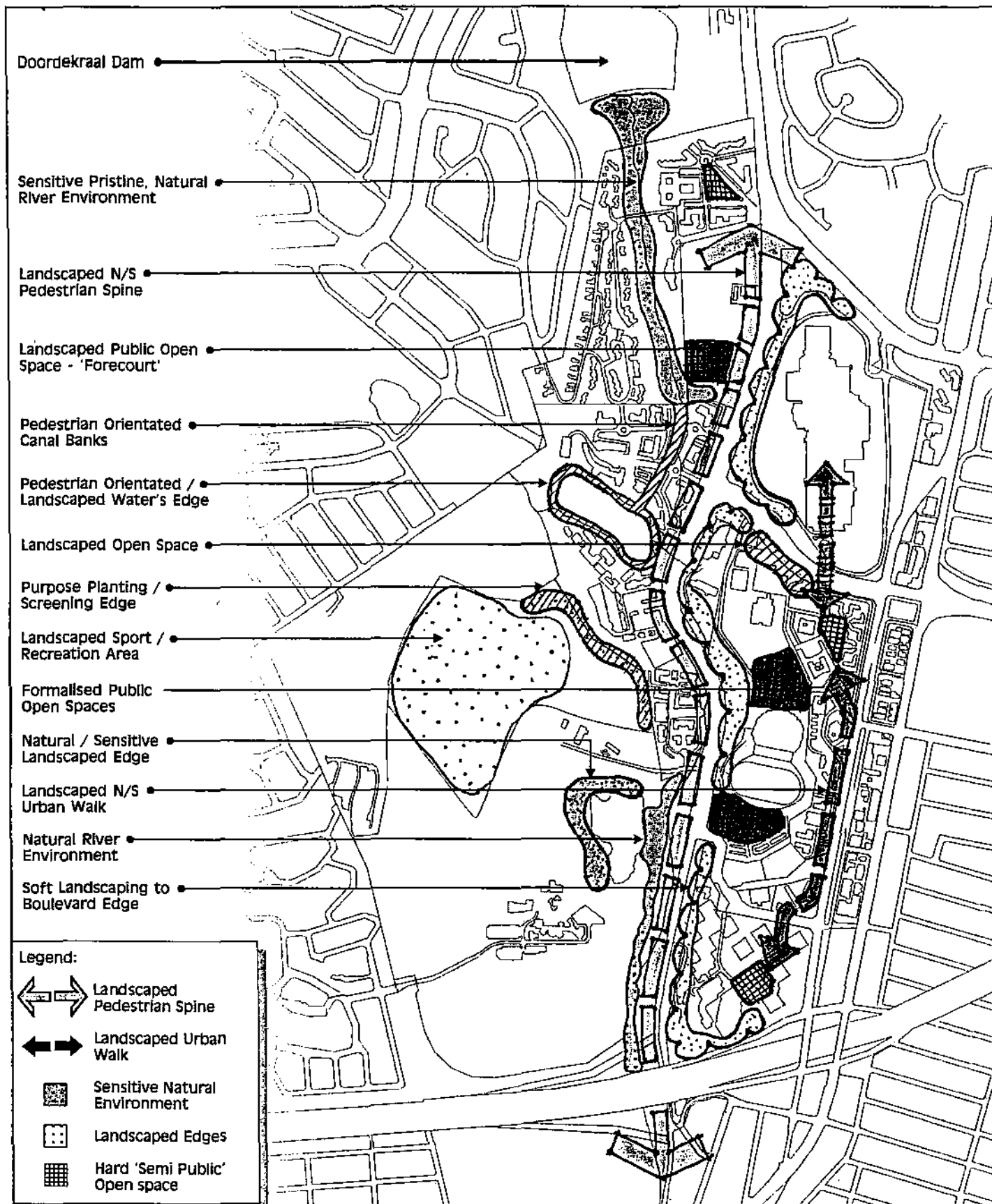
Although technically outside the ERV study area, the PAWC site between Willie van Schoor and Durban Roads functions as a visible southern "gateway" site to the ERV. As such it should reflect the character of the area and thereby assist in the promotion of activities within the ERV. The site in its current state does not serve the interests of the ERV Partnership and should be appropriately landscaped to visually improve the entrance to the ERV.

13.2 Landscaping and Greening Policies

In order to implement the landscaping framework, it is necessary for all parties to subscribe to its implementation. It will be necessary to identify the priority focus areas of this framework, such as the north-south pedestrian spine and boulevard and prepare detailed landscaping plans for its implementation.

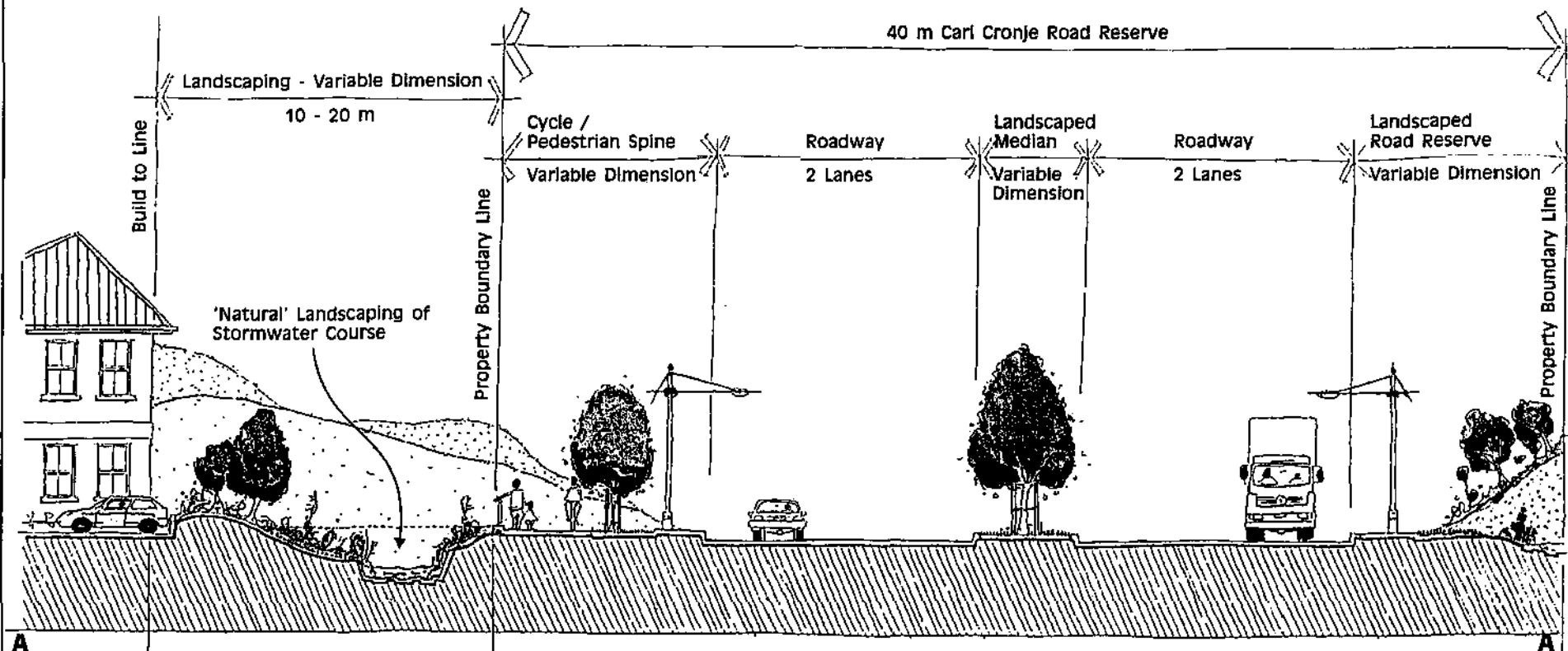
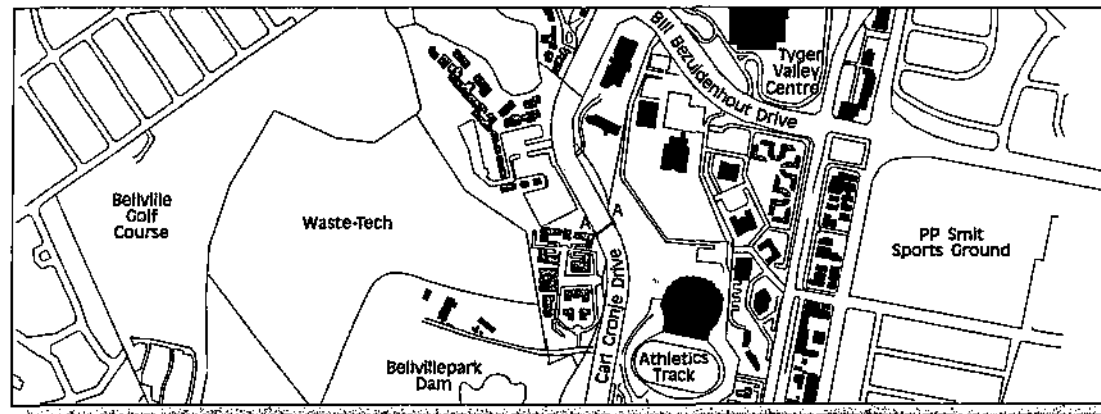
The following landscaping policies pertain to the ERV in general:

- ◆ An overall planting theme should be created for the Valley. This theme should be based on indigenous species.

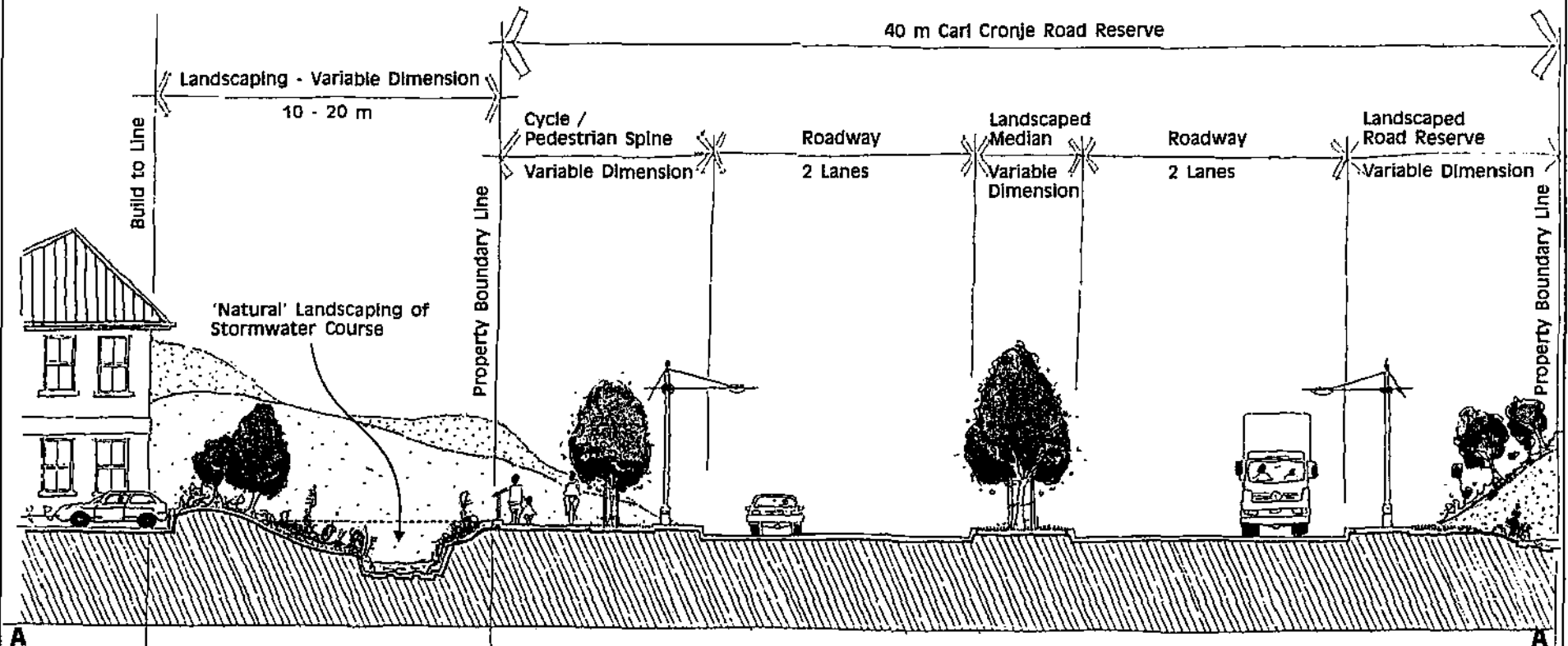
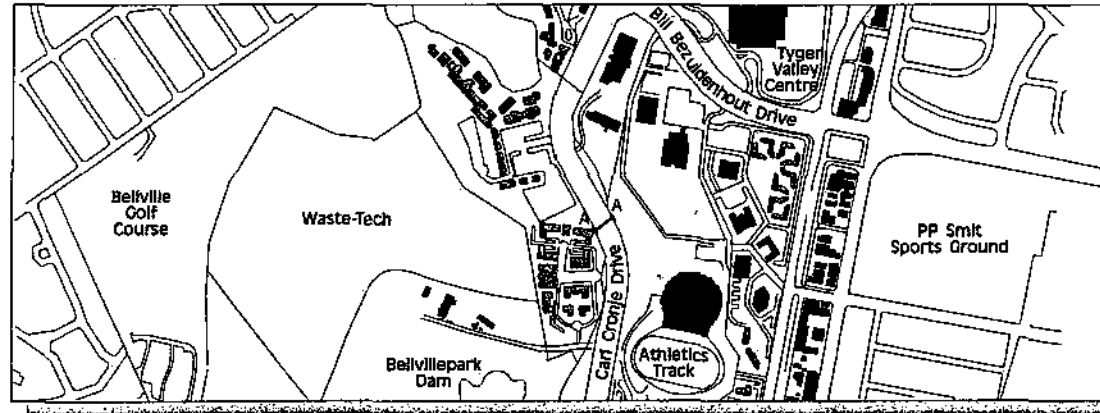


- ◆ The natural river course should be enhanced through appropriate landscaping and every effort should be made to provide a natural course and finish for canalised areas (Figure 39).
- ◆ A suitable portion of land to the west of Carl Cronje Drive should be identified and landscaped for the purpose of a continuous public pedestrian walkway.
- ◆ The pedestrian spine and river area should be landscaped in accordance with the requirements of the stormwater system, the natural and visual attributes of the area and the movement patterns of vehicles and pedestrians entering properties to the west of the walkway.
- ◆ The eastern edge of Carl Cronje Drive should be landscaped and the median planted to create a boulevard. This should be done in accordance with a co-ordinated landscaping plan.
- ◆ The urban walk along Willie van Schoor Drive should be landscaped to provide a safe and user-friendly environment.
- ◆ The edge of Bill Bezuidenhout Drive should be landscaped to reduce the scale of the road and create a sense of place.
- ◆ The parking area to the south of the Bellville Stadium should be enhanced through appropriate hard and soft landscaping.
- ◆ The parking/pedestrian area to the north of the Velodrome should be enhanced through appropriate hard and soft landscaping.
- ◆ The "Forecourt" park on the Mini-Cape site should be landscaped to provide an entrance to the river-walk and allow for a variety of uses (Figure 40).
- ◆ The escarpment and sensitive slopes should be protected, stabilised and planted.
- ◆ Valuable tree lines should be retained and appropriate screenplanting should be provided to separate different uses and activities.
- ◆ Screenplanting should be considered to soften the edge of the Waste-Tech site.
- ◆ The ERV Partnership and PAWC should resolve the development/non-development and landscaping of the visually important site on Durban Road/Willie van Schoor Drive at the southern entrance to the ERV. In the interim, the proliferation of mobile signs should be curtailed.

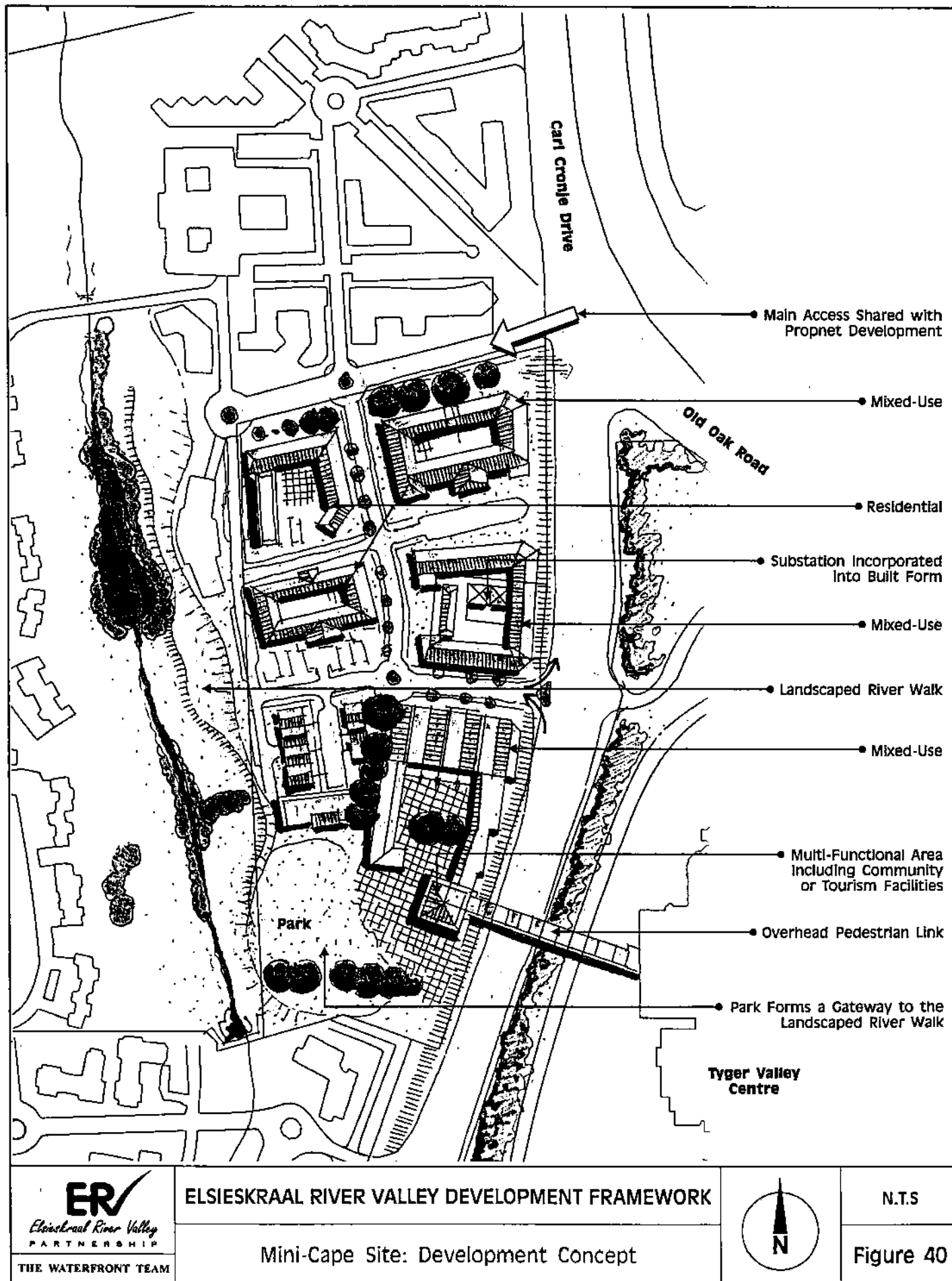
The financial implications of future development in the ERV and the implementation of some of the preceding policies are now assessed in terms of benefits accruing to the ERV Partnership and the City of Tygerberg and the potential for job creation.



 THE WATERFRONT TEAM	ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK Typical Carl Cronje Road Section Looking North	N.T.S Figure 39
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 THE WATERFRONT TEAM	ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK Typical Carl Cronje Road Section Looking North	N.T.S Figure 39
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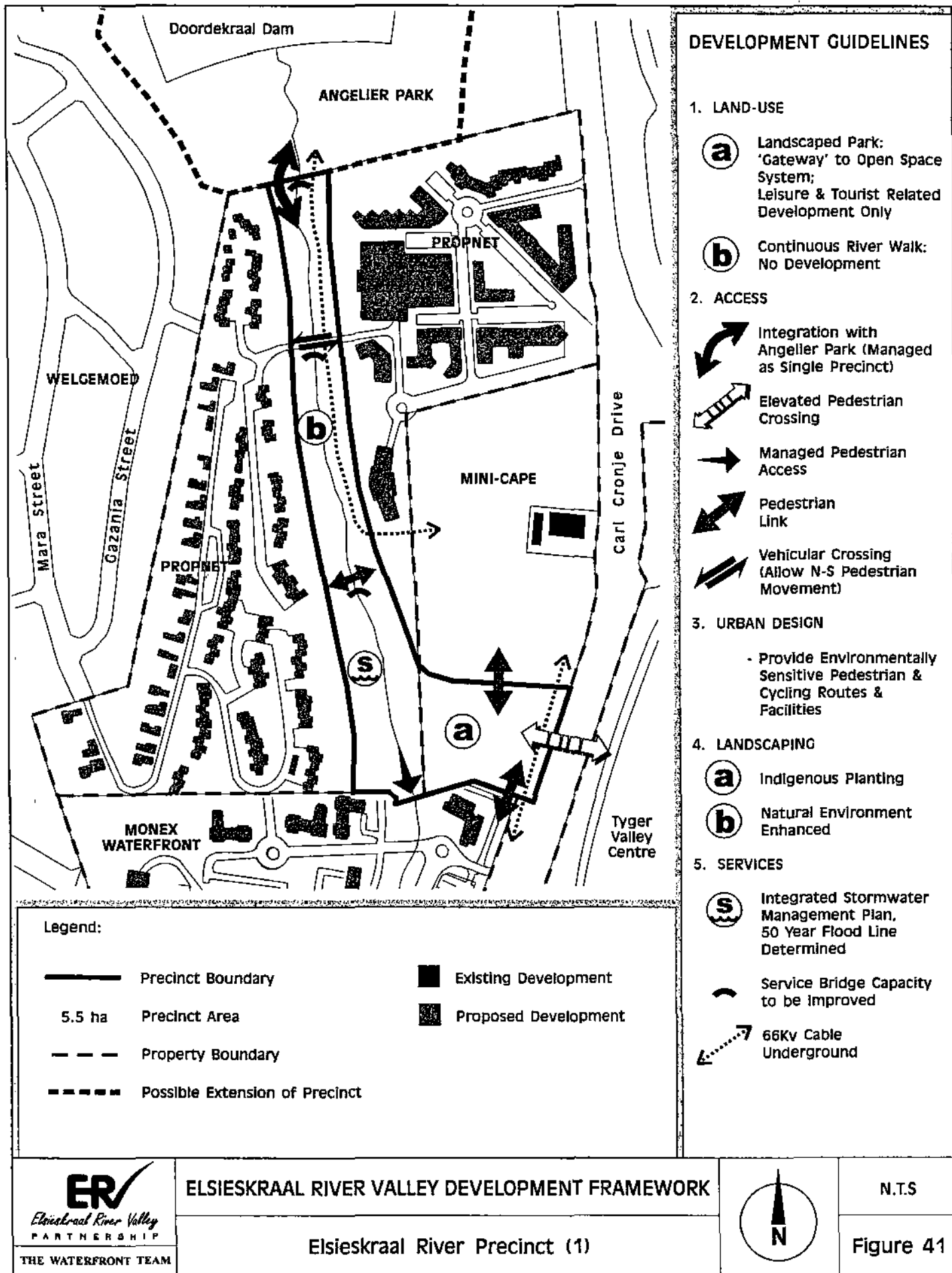


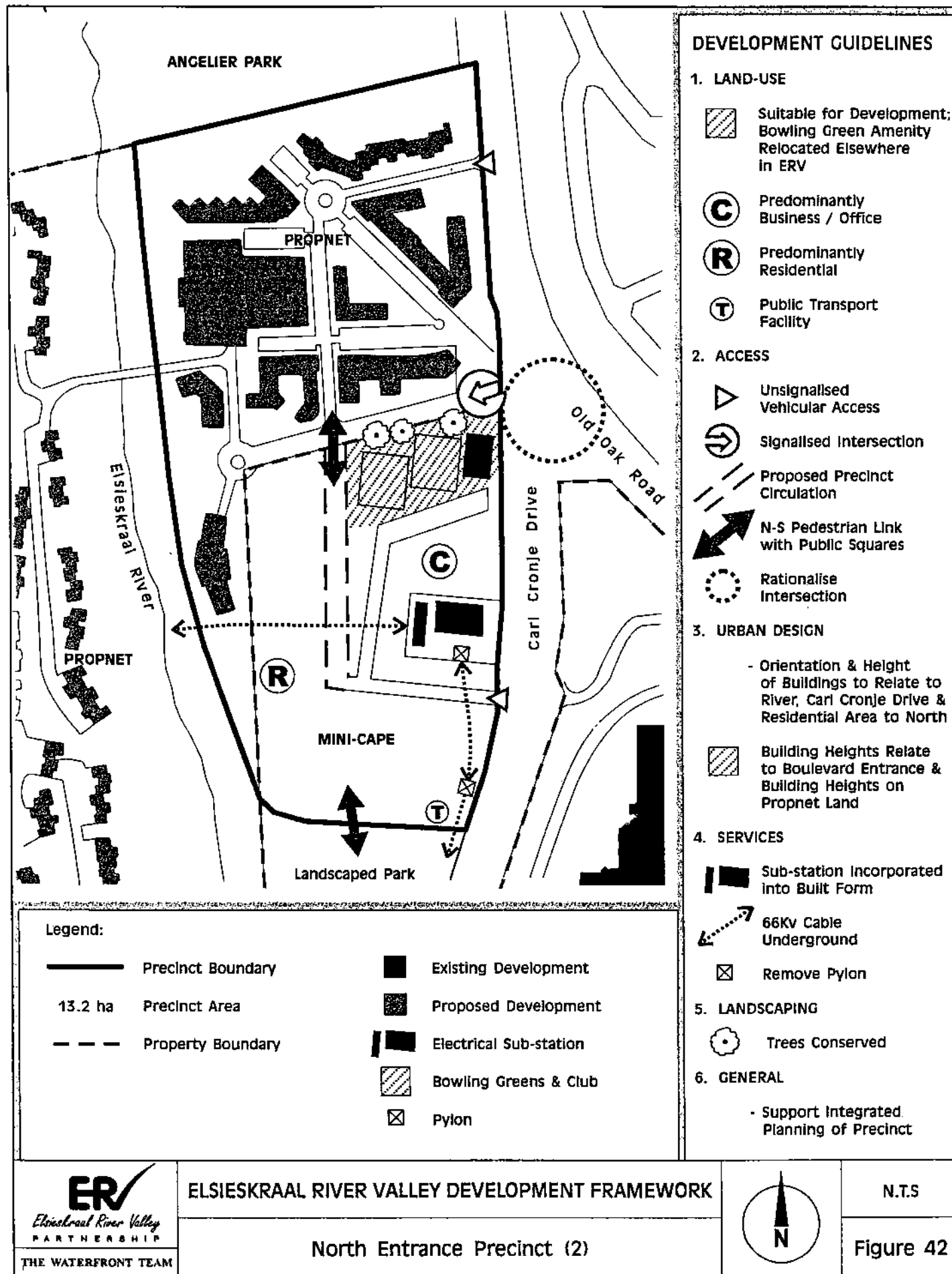
14.0 DEVELOPMENT GUIDELINES FOR PRECINCTS

The preceding diagrams (Figures 34 to 40) indicated the land use, open space, landscaping and movement system components of the Development Framework. It is intended that local authority officials apply these principles when assessing new development proposals. In order to assist all parties in assessing the merits of proposals vis-à-vis the Development Framework policies, development guidelines for each geographic precinct are provided.

Figures 41 to 54 include the most important policies which are applicable to each precinct. Development guidelines are unlike statutory town planning regulations and therefore do not provide numerical values for building heights, setbacks, parking numbers, etc. Rather, they are intended to give decision-makers the flexibility to weigh up the merits of proposals which are not strictly consistent with approved zonings. Instead of rejecting these proposals outright or subjecting developers to unnecessary lengthy procedures, decision-makers should apply these development guidelines and test them in the context of the intentions of the Development Framework.

For this reason, the following development guidelines are intended to expedite approval of development proposals and thereby contribute to the economic vitality of the ERV.





DEVELOPMENT GUIDELINES

1. LAND-USE

- (R)** Residential Development Only

2. ACCESS

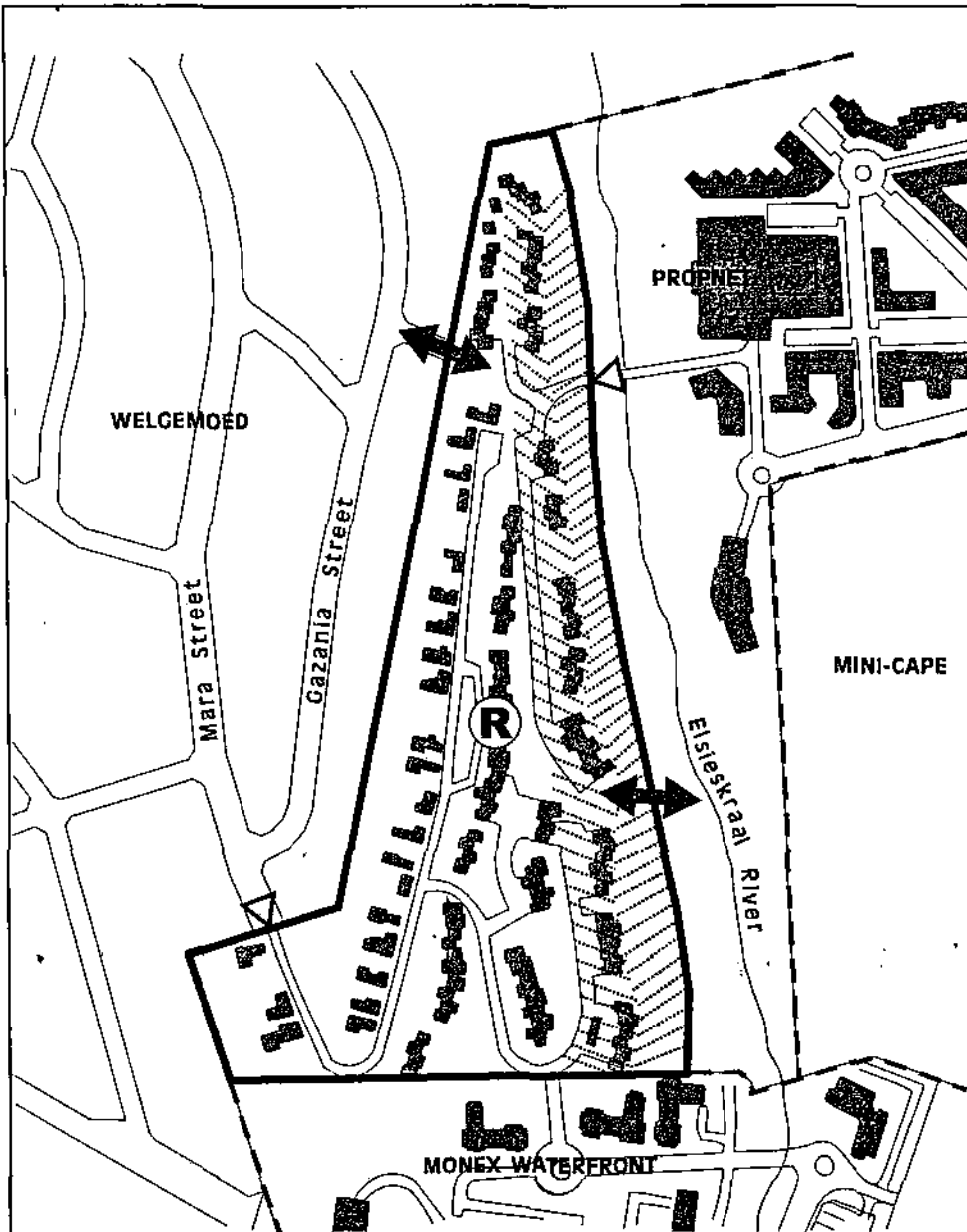
- ▷** Unsignalised Vehicular Access
- ↔** Pedestrian Access Only

3. URBAN DESIGN

- Appropriate Densities & Heights for Transition Between Residential Welgemoed & Commercial ERV
- Building Heights to take Cognisance of Views from East
- Building Orientation to Relate to River Environment

4. LANDSCAPING

- ///** Indigenous Landscaping to Support Natural River Environment



Legend:

- Precinct Boundary
- 9.9 ha** Precinct Area
- - -** Property Boundary
- Proposed Development



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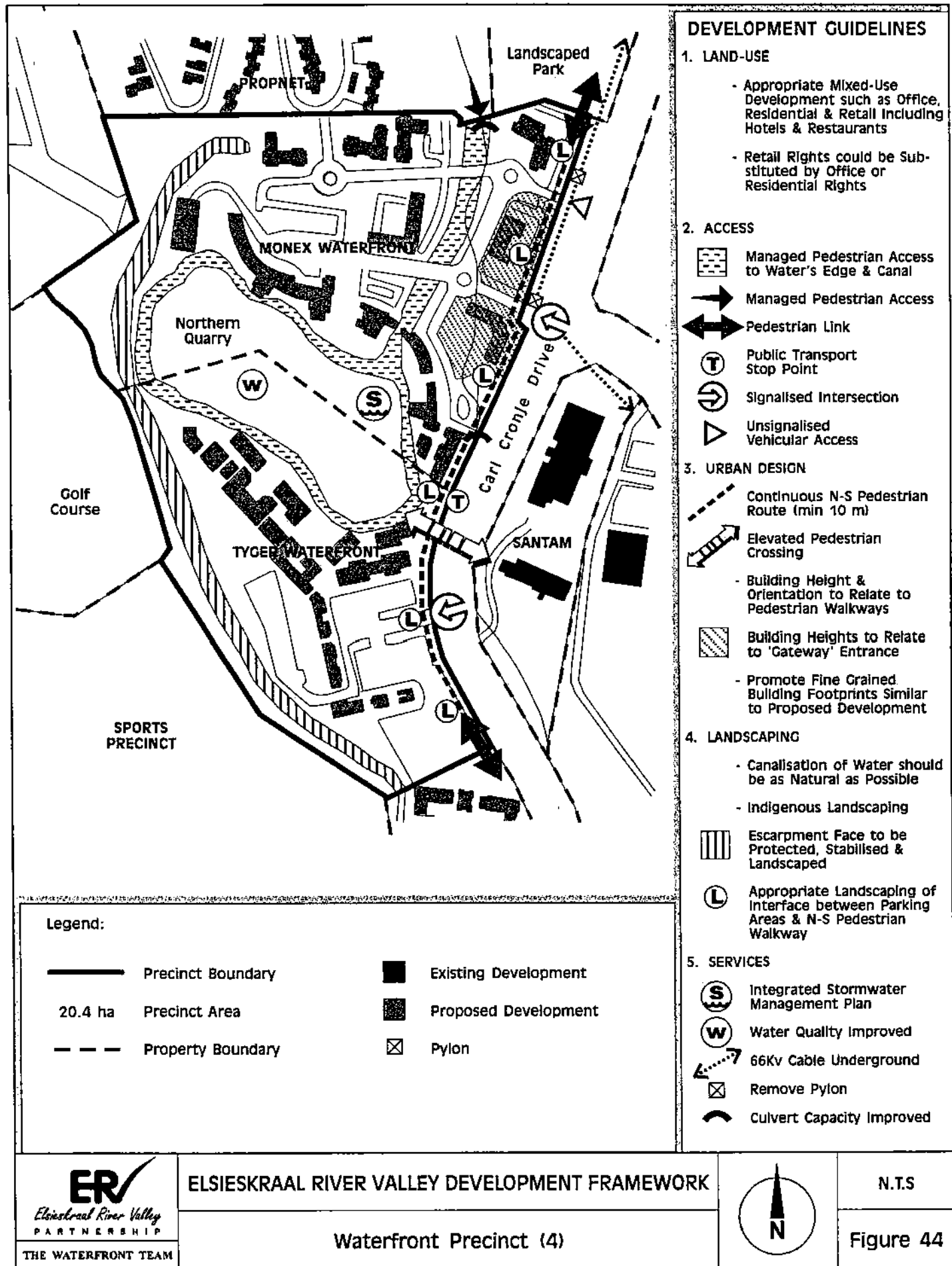
ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

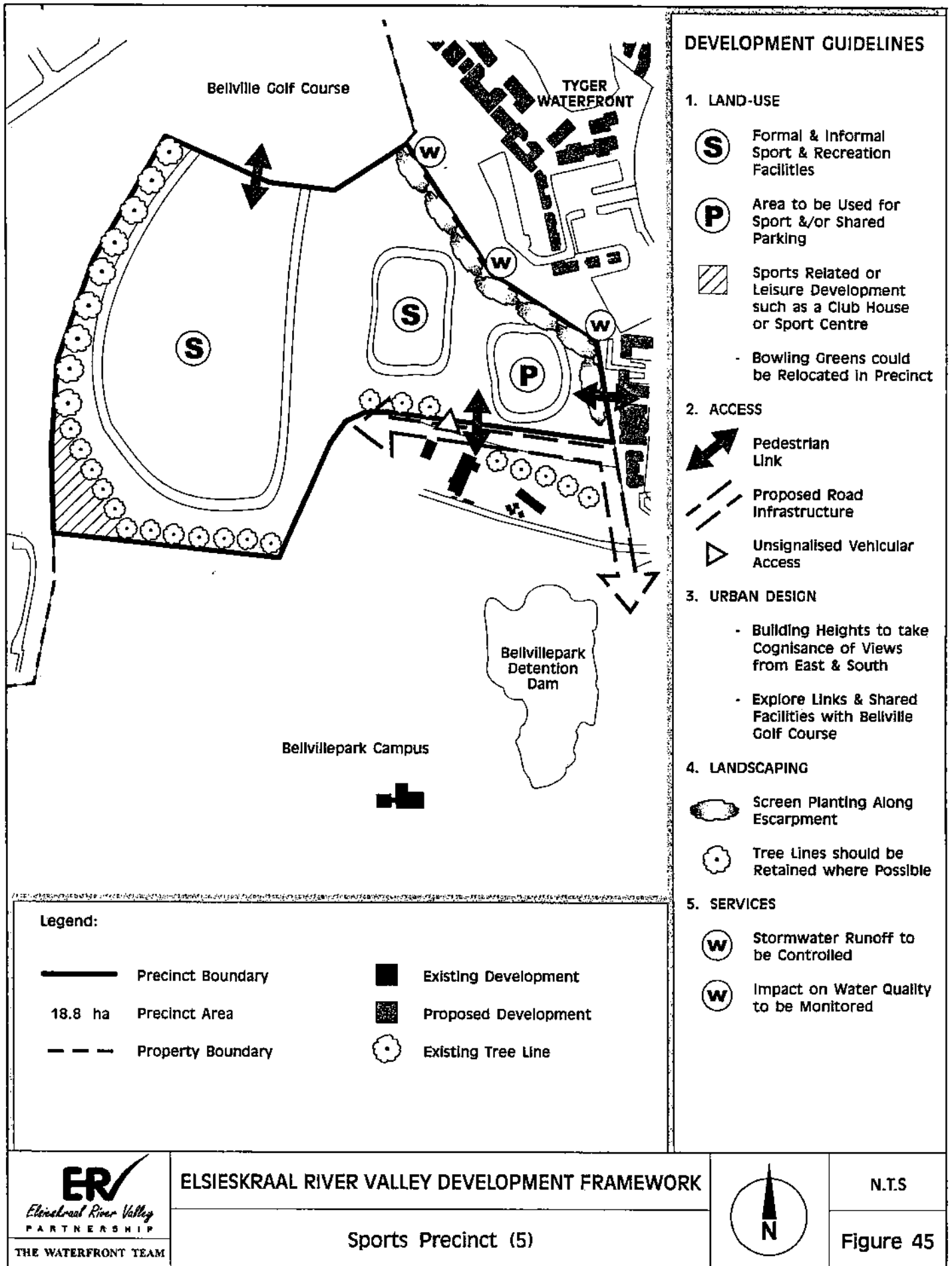
North Residential Precinct (3)



N.T.S

Figure 43





DEVELOPMENT GUIDELINES

1. LAND-USE

- (a)** Mixed Use Development Incl. Office, Business & Residential
- (b)** Mixed Use Development Incl. Office, Business, Residential & Hotel
- (c)** Office & Business where Appropriate

2. ACCESS

- Pedestrian Crossing
- Pedestrian Link
- Proposed Road Infrastructure
- Signalled Intersection
- Vehicular Access to Precinct to be Rationalised
- Temporary Access to be Removed
- Unsignalised Vehicular Access
- Public Transport Stop

3. URBAN DESIGN

- Continuous N-S Pedestrian Route (min 10 m)
- (ac)** Building Height & Orientation to Relate to Walkways
- (b)** Building Height to take Cognisance of Views from East
- Managed Public Access to Water's Edge where Appropriate

4. LANDSCAPING

- (a)** Appropriate Planting between Development & Public Walkway
- Planting to be Sensitive to Natural River
- Sensitive Treatment of Slope Area
- (L)** Appropriate Landscaping of Interface between Parking & N-S Walkway

5. SERVICES

- (S)** Integrated Stormwater Management Plan
- (w)** Water Quality Improved
- (si)** Development to take Cognisance of Stormwater Infrastructure
- Culvert Capacity Improved

Legend:

- Precinct Boundary
- 16.3 ha Precinct Area
- Property Boundary
- Existing Development
- Proposed Development
- Emergency Spillway
- Embankment
- Existing Tree Line



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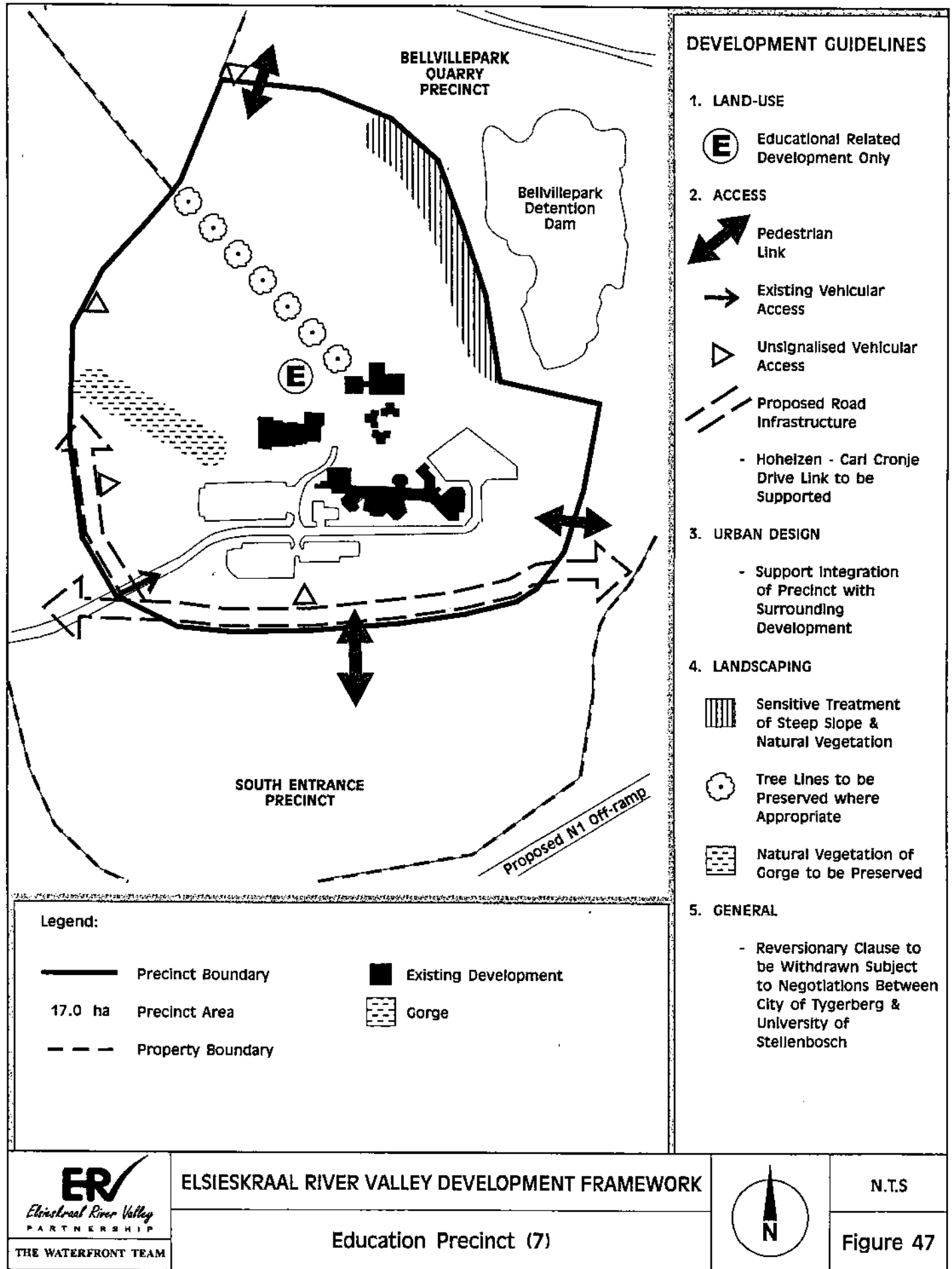
ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

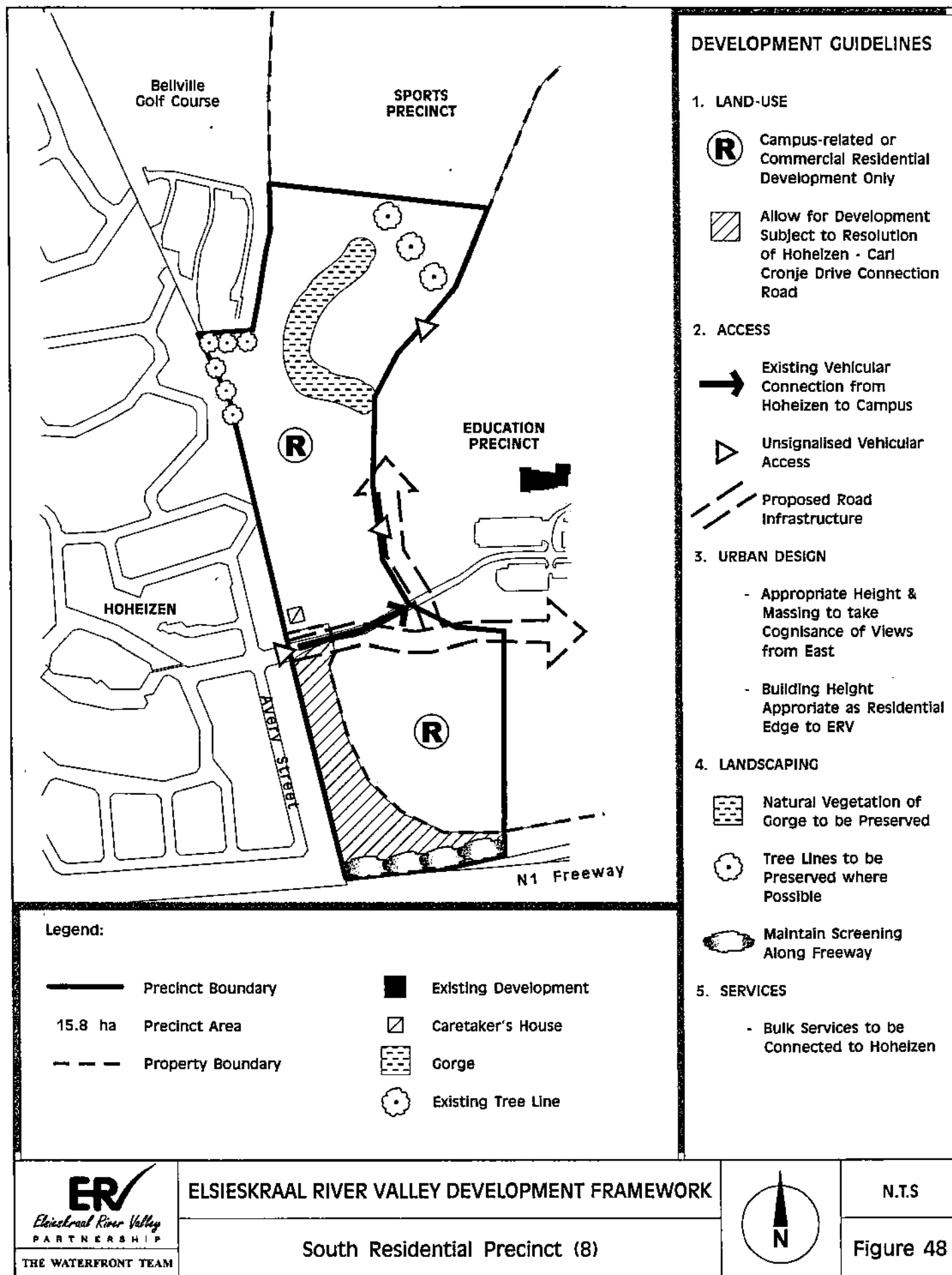
Bellvillepark Quarry Precinct (6)

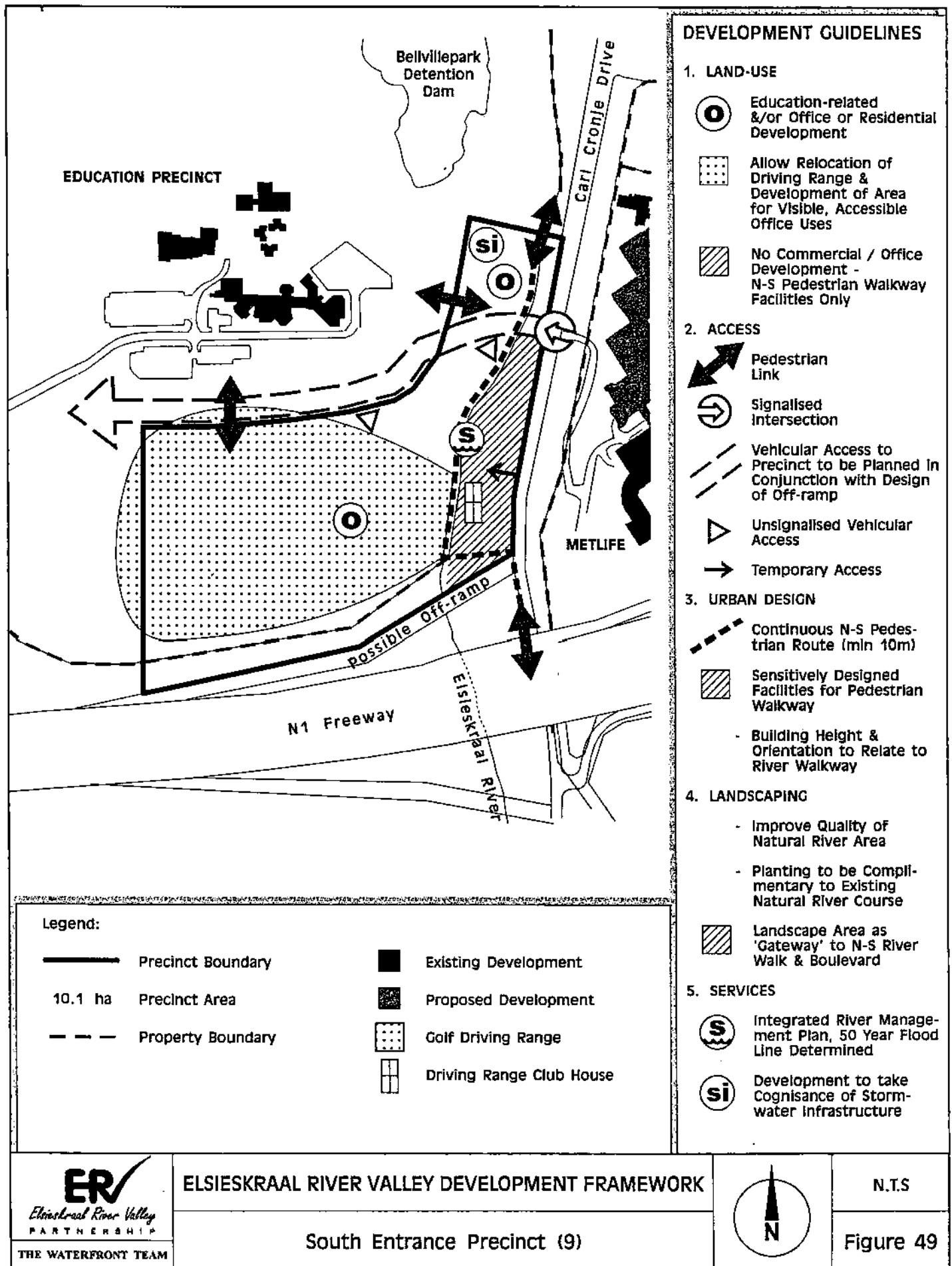


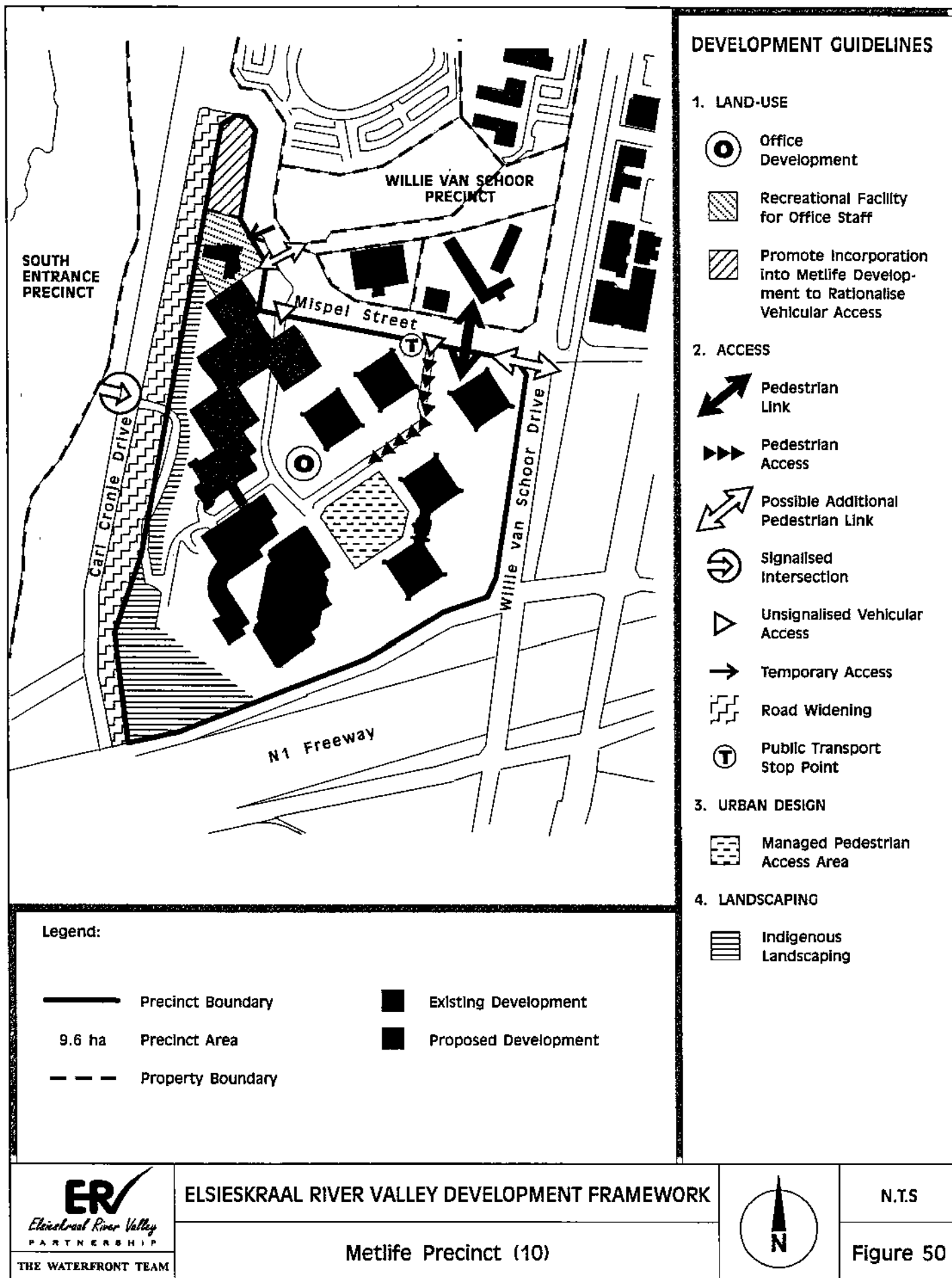
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Figure 46









THE WATERFRONT TEAM

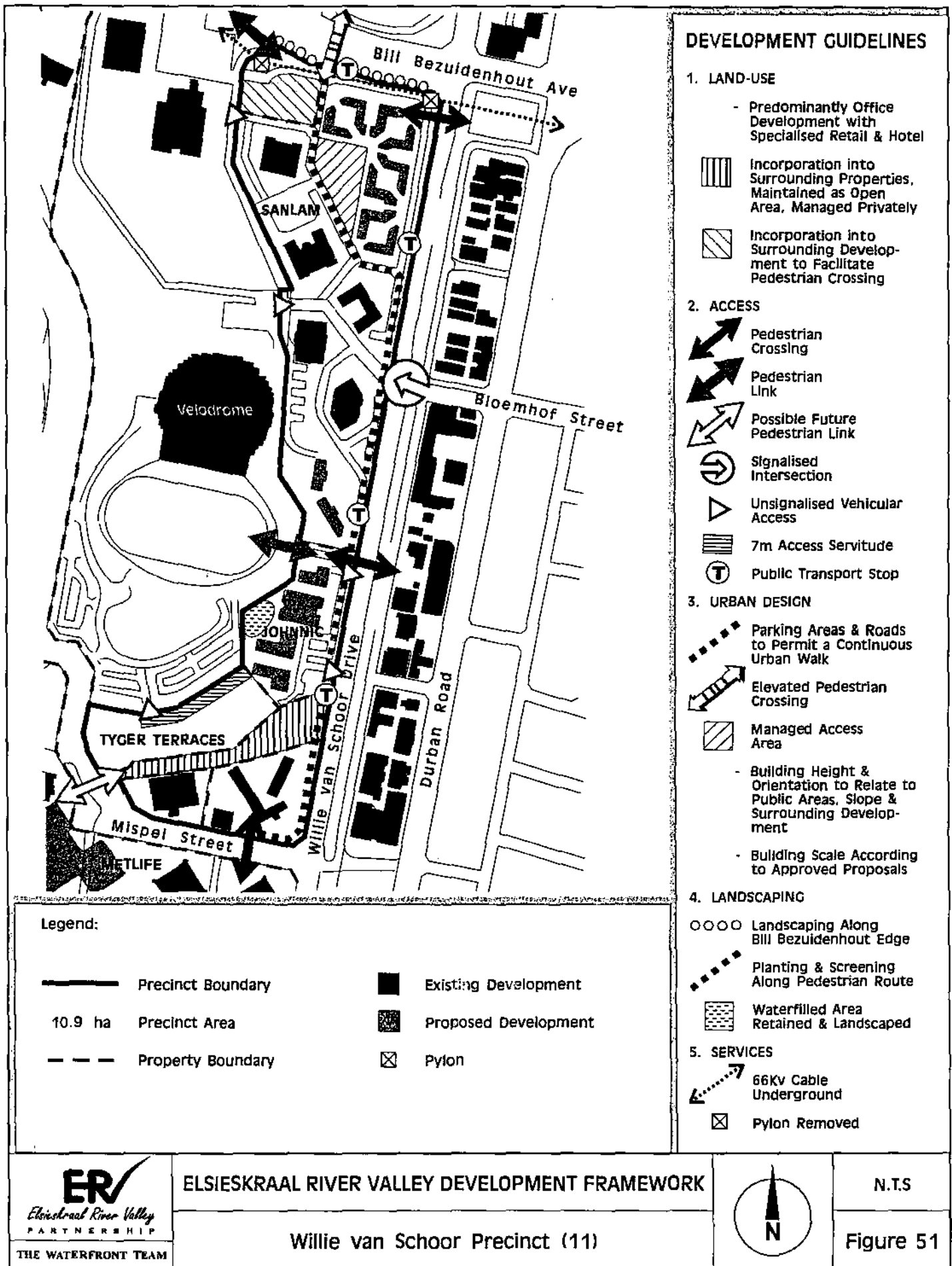
ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

Metlife Precinct (10)



N.T.S

Figure 50



ER
Elsieskraal River Valley
PARTNERSHIP

THE WATERFRONT TEAM

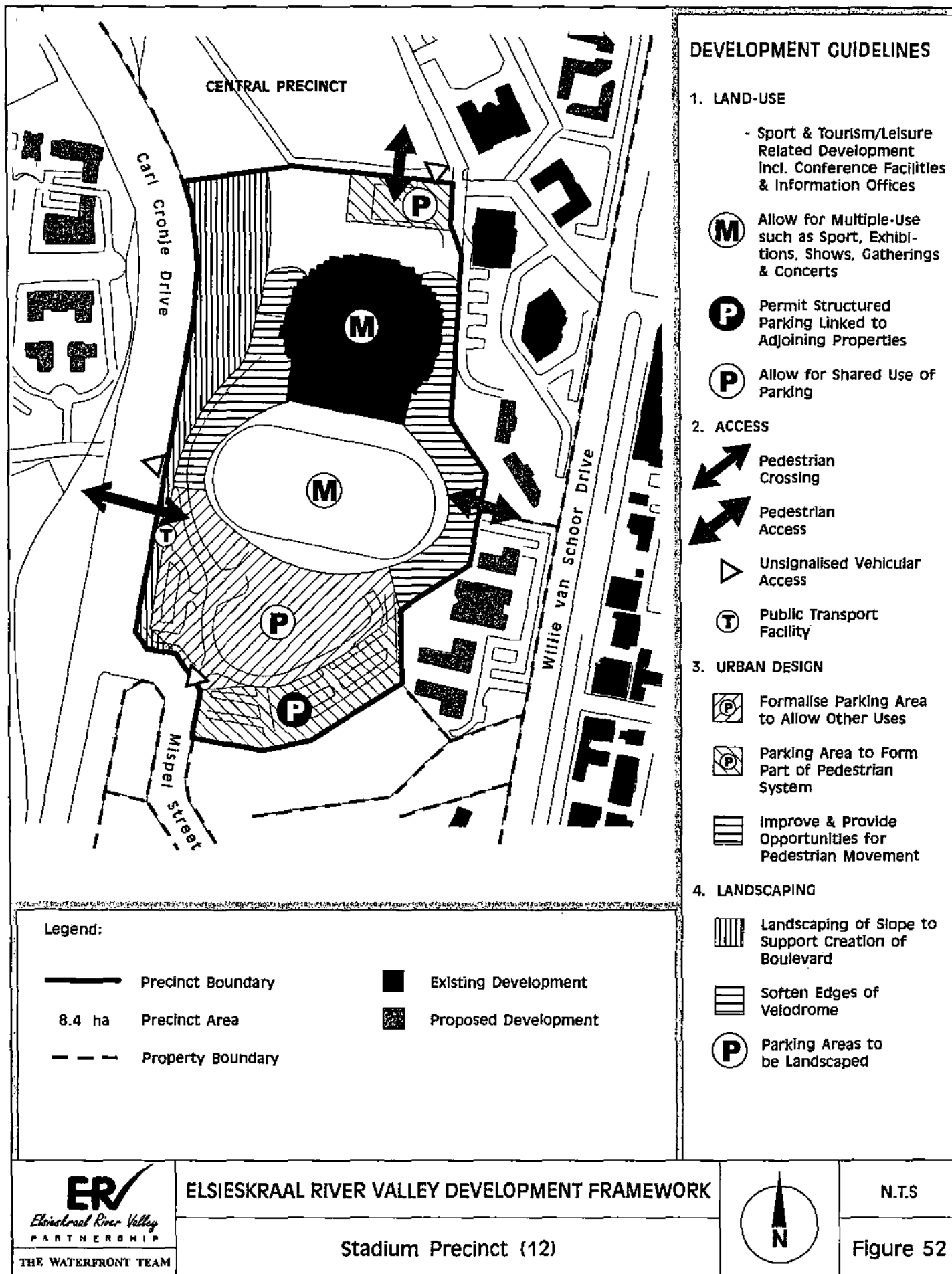
ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

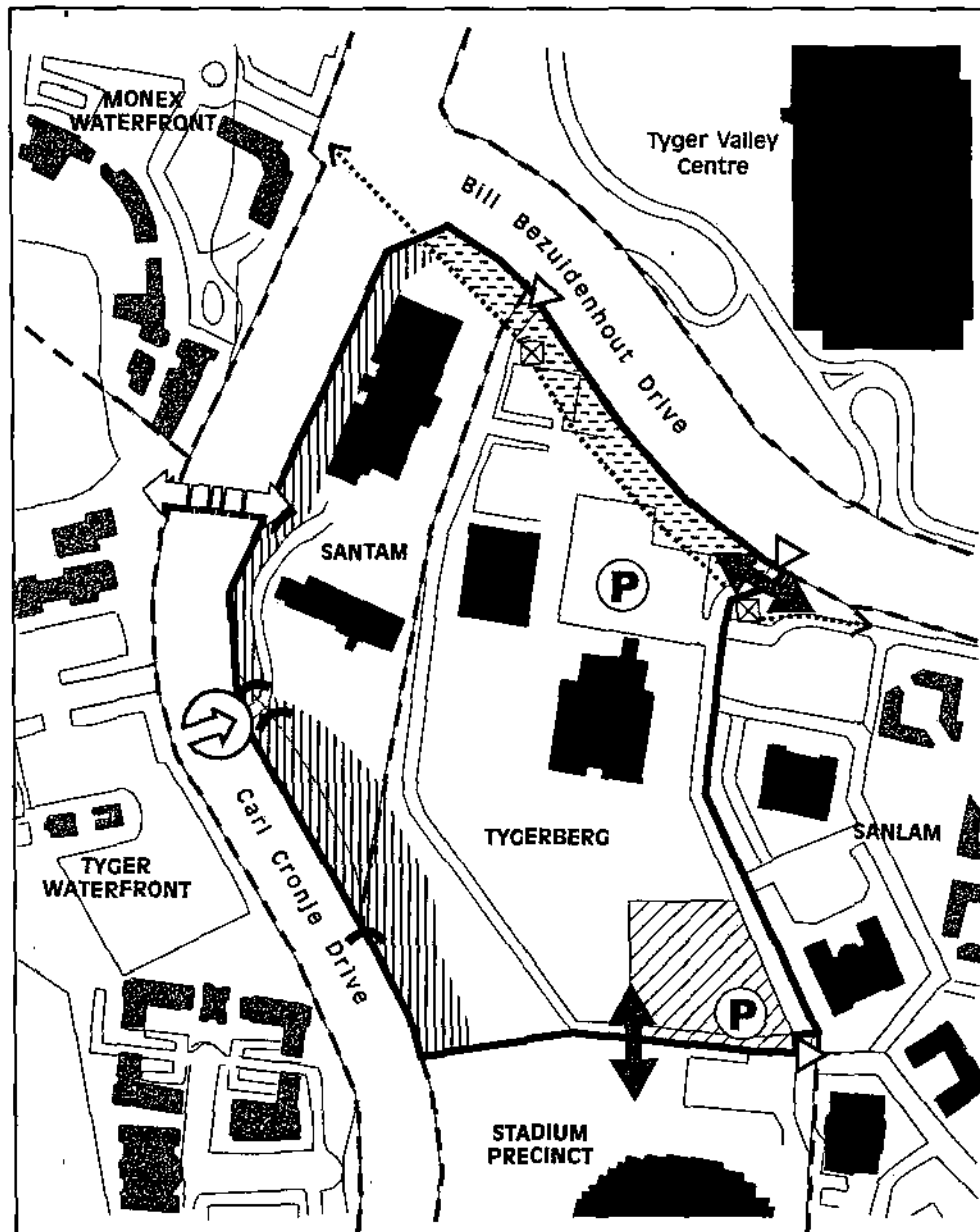
Willie van Schoor Precinct (11)



N.T.S

Figure 51





Legend:

- | | | | |
|--|----------------------|--|----------------------|
| | Precinct Boundary | | Existing Development |
| | 8.9 ha Precinct Area | | Proposed Development |
| | Property Boundary | | Pylon |

DEVELOPMENT GUIDELINES

1. LAND-USE

- Predominantly Office Development & Uses Complimentary to Stadium Precinct eg. Sports, Tourism & Leisure Developments

Allow for Shared Use of Parking

2. ACCESS

- Elevated Pedestrian Crossing
- Pedestrian Link
- Signalled Intersection
- Unsignalled Vehicular Access

3. URBAN DESIGN

- Building Height to Take Cognisance of Views from Carl Cronje Drive & Residential Areas to the West

Parking Area to Form Part of Pedestrian System

4. LANDSCAPING

- Landscaping to Support Creation of Boulevard
- Planting Along Bill Bezuidehout
- Parking Areas to be Landscaped

5. SERVICES

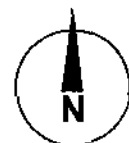
- 66Kv Cable Underground
- Pylons Removed
- Capacity of Culverts to be Improved

ER
Elsieskraal River Valley
PARTNERSHIP

THE WATERFRONT TEAM

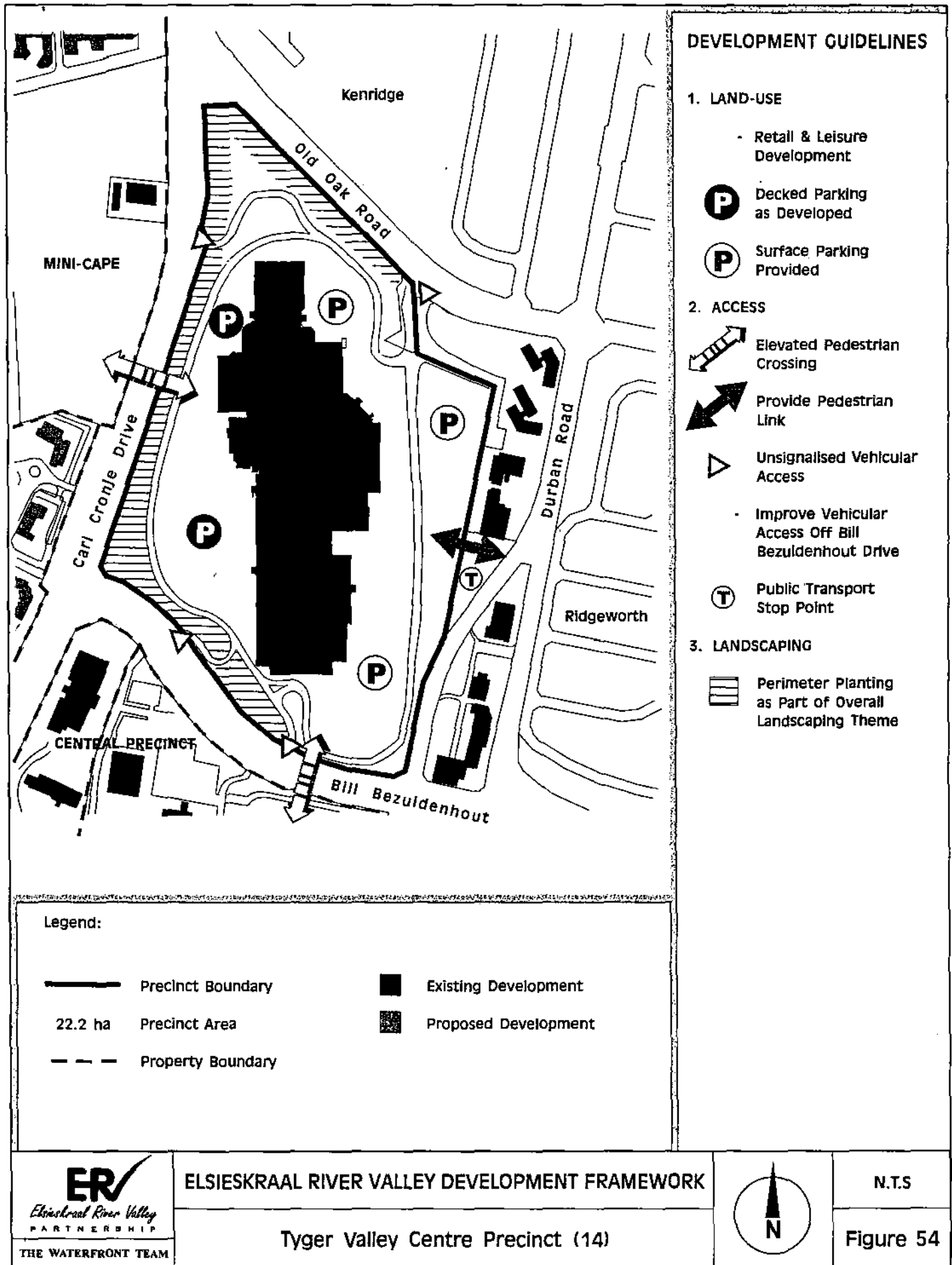
ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

Central Precinct (13)



N.T.S

Figure 53



15.0 FINANCIAL AND COST IMPACT ANALYSIS

15.1 Methodology

The methodology used in analysing the financial and cost impact, which the built and unbuilt bulk will have on the Elsieskraal River Valley, is outlined in Figure 55.

Cognisance is taken of the Urban-Econ 1998 economic report which forms an important input to the Tygerberg Spatial Development Framework.

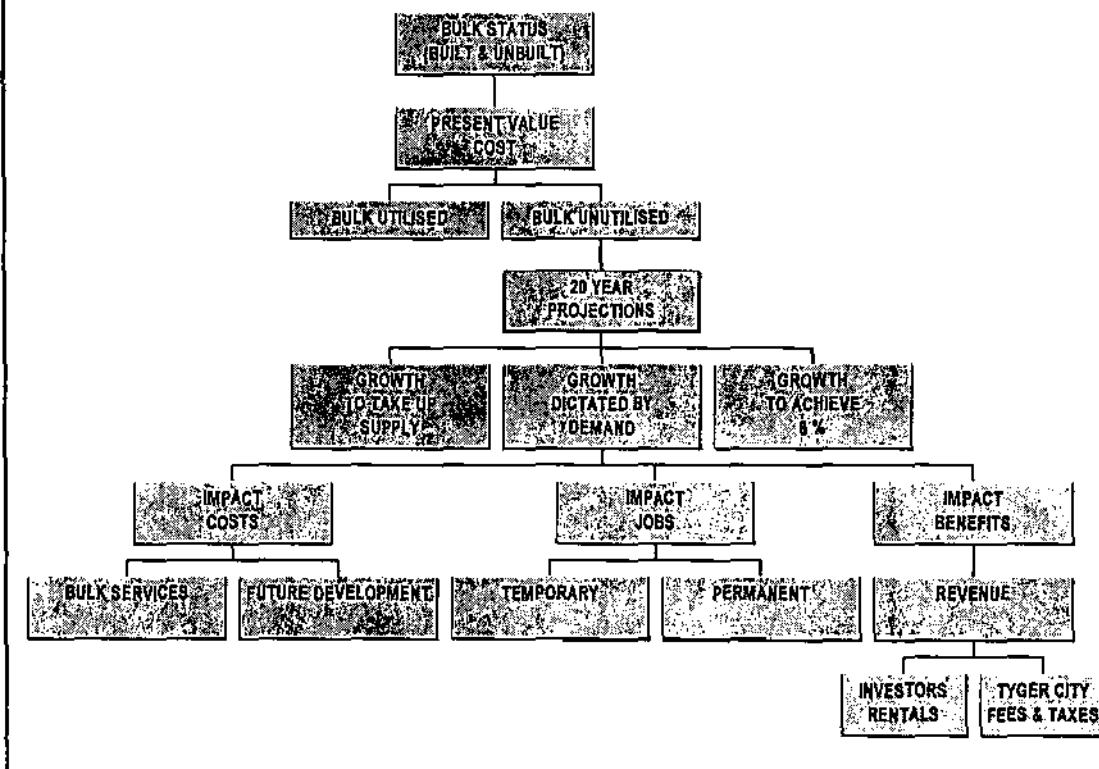
Relevant observations contained in the Urban-Econ report are incorporated in this financial and cost impact analysis. Particularly, the estimates of the annual percentage rates of growths for retail, office and residential spaces are intrinsic to the assumptions made in determining the weighted average rate of economic growth in the ERV and the consequent projections and comparisons which are made to the year 2018.

There are five main areas of interest, namely :

- the cost impact on bulk services;
- the cost implications of future development;
- the impact which future development will have on the creation of jobs, both permanent and temporary;
- the generation of revenue (cost benefits); and
- a possible strategy to encourage optimum growth in the ERV, in line possibly, with the GEAR program.

ERV : ECONOMIC MODEL DEVELOPMENT IMPACT ANALYSIS

Figure 55



The methodology is as follows:

First, the status of the zoning and utilisation of the rights and more particularly, the gross leasable area (GLA), were determined.

Second, the cost of development, in present value terms, of bulk built to date and unbuilt bulk was calculated.

Third, an analysis was made of three selected annual percentage rates of growth, namely :

- the percentage rate of growth per annum required to absorb the entire remaining bulk, (both zoned and those areas yet unzoned). Assumptions concerning the unzoned areas are made within this report;
- the estimated percentage rate of growth per annum as represented by market demand with particular reference to the Urban-Econ 1998 report; and
- the weighted average rate of growth required to achieve the "high road" scenario (Table 6.1 below).

Fourth, projections were made over a period of twenty years to determine the impact of the above assumptions on :

- bulk services, both on site and off site;
- future cost of development;
- future revenue to the City of Tygerberg and the private sector; and
- job creation.

Several conclusions are drawn from the above analyses and recommendations are offered, with particular reference to the priority of development and the achievement of the "high road" scenario.

Finally, inputs are made to the growth management plan as formulated in this report.

15.2 The Status of Existing Bulk

Table 6.1 sets out the status of existing and anticipated future bulk rights. It is evident that approximately 25% of the total bulk has been built to date. This represents 278 854 m² of GLA of offices, retail and residential space.

There remains a further 75%, or 861 000 m² of unbuilt GLA, of which 370 500 m² is unzoned. The unzoned areas fall within the University of Stellenbosch, Mini-Cape and Sportika precincts.

Table 6.1

SUMMARY BULK & GLA BUILT, UNBUILT & ADDITIONAL: GEOGRAPHIC LOCATION AND DISTRIBUTION						
	BUILT		UNBUILT		ADDITIONAL	
	BULK	GLA	BULK	GLA	BULK	GLA
Erv Zone	163,540	171,328	442,613	394,455		
Dbn Road Corridor	126,503	107,526	113,062	96,103		
US. Sportika, Mini-Cape					411,885	370,498
TOTALS	290,043	278,854	555,675	490,558	411,885	370,498

Table 6.2

STATUS						
	BULK	GLA	%		GLA	%
BUILT	290,043	278,854	24.46%	UTILISED	278,854	24.46%
UNBUILT	555,675	861,056	75.54%	UNUTILISED	490,558	43.03%
ADDITIONAL	411,885			ADDITIONAL	370,498	32.50%
TOTALS	1,257,603	1,139,910	100.00%		1,139,910	100.00%

Note: • The above GLA amounts include the residential zoning.

- Built University of Stellenbosch GLA is included in ERV zone in Table 6.1 (8302 m²)

The use distribution of bulk is set out in Table 7

For instance, of the total GLA zoned for offices (475 750 m²), approximately 34 %, or 190 387m², is built. Approximately 36% of the potential retail GLA is built and significantly, only 2.25% of the potential residential area is built. Of all the GLA, 45% is zoned for offices, 25% for retail, 21% for residential and the balance, approximately 12% for educational use, thus making up a total GLA of approximately 1 140 000 square meters. It is also of significance that 370 500 m² of GLA could still be added to the existing pool.

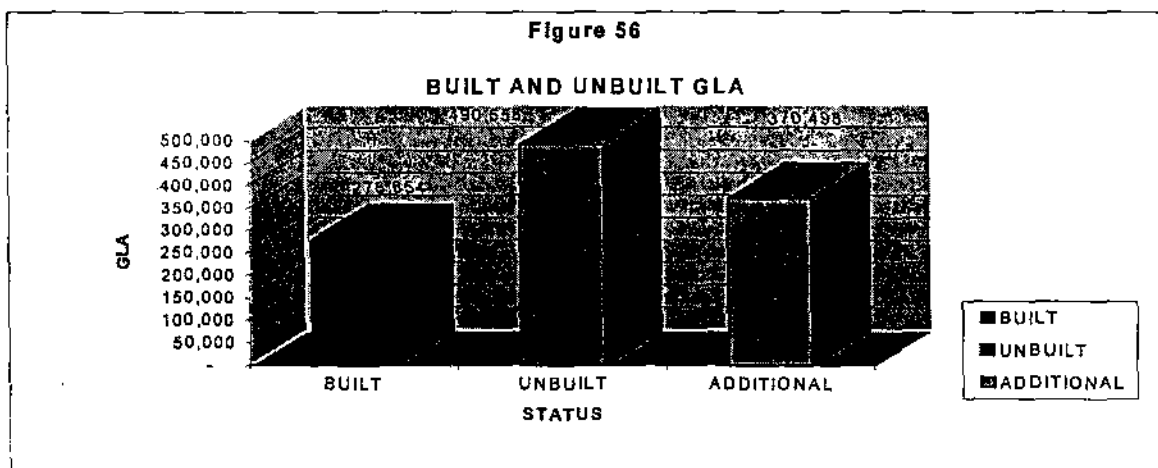
Table 7.1

SUMMARY BULK & GLA BUILT, UNBUILT & ADDITIONAL: GEOGRAPHIC LOCATION AND DISTRIBUTION								
	GLA	GLA	BUILT		UNBUILT		ADDITIONAL	
	% BUILT	TOTALS	BULK	GLA	BULK	GLA	BULK	GLA
Offices	34.02%	475,751	190,387	161,828	280,638	238,542	88,684	75,381
Retail	35.92%	287,752	81,337	103,348	176,314	154,141	35,604	30,263
Residential	2.25%	239,223	6,325	5,376	98,723	97,875	135,972	135,972
Educational	6.05%	137,183	11,995	8,302	-	-	151,625	128,881
TOTAL		1,139,910	290,043	278,854	555,675	490,558	411,885	370,498

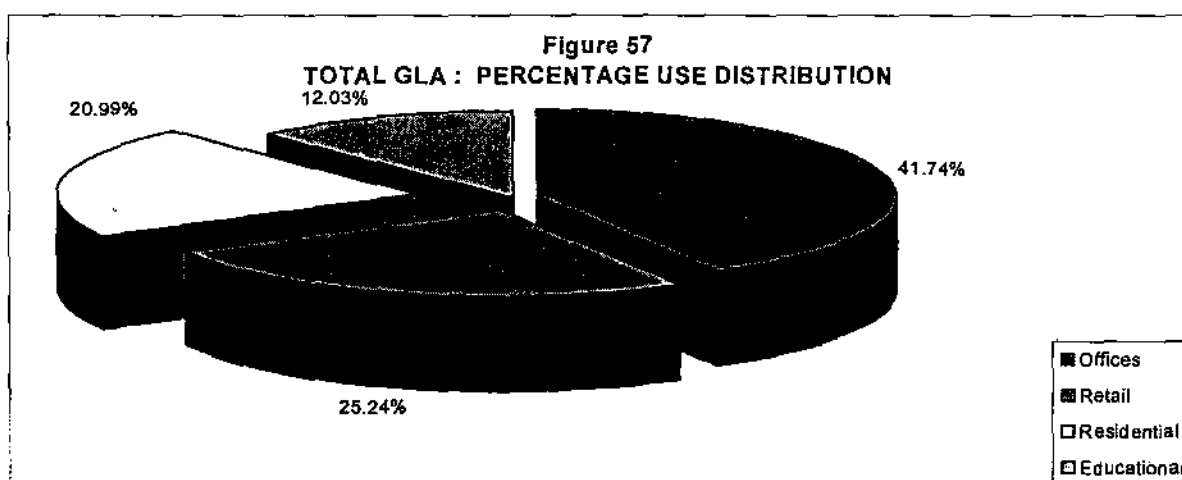
Table 7.2

USE DISTRIBUTION TOTAL GLA	
USE	%
Offices	41.74%
Retail	25.24%
Residential	20.99%
Education	12.03%
TOTAL	100.00%

The graphic relationship between the built and unbuilt GLA is illustrated in Figure 56

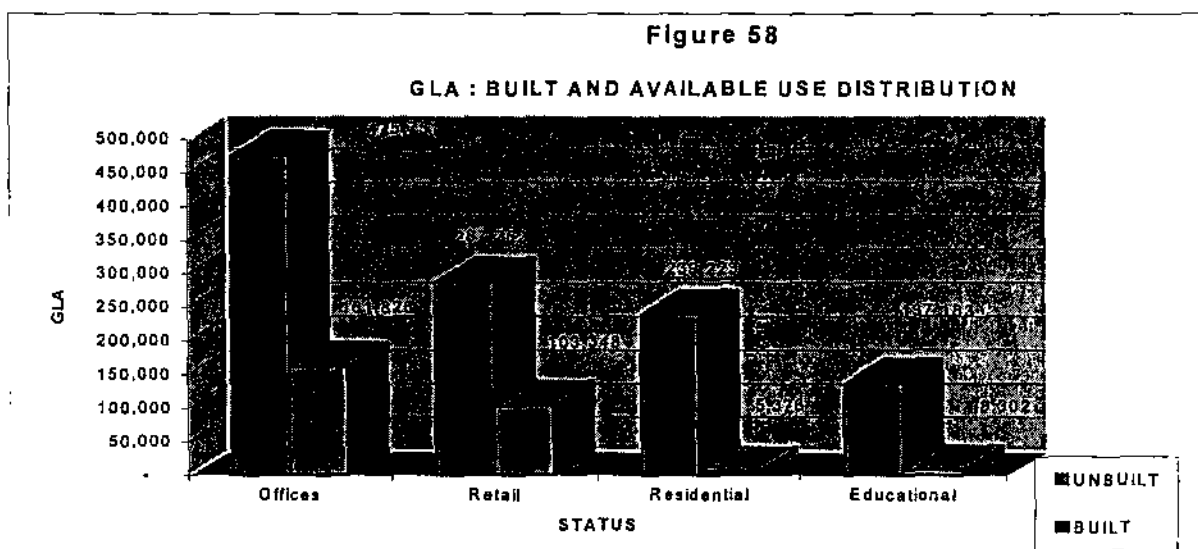


The percentage use distribution in terms of total GLA, is represented in Figure 57 below and Table 7.2 above.



The distribution of built GLA and total GLA, in categories of offices, retail, residential and educational usage, is further illustrated in Figure 58.

It is evident that whilst there is a large reservoir of unbuilt GLA in all categories, it is the residential category which in particular, draws attention.



A further observation is the comparatively large area of office space in supply.

15.3 Percentage Annual Rate of Growth

The annual percentage growth required to absorb the full available GLA, over 20 years is calculated to be 3.53%.

In other words, should the average rate of growth for all categories of land use, grow at an average rate of 3.53%, all the GLA and the additional bulk which is not zoned as referred to above, will be developed over 20 years..

Arguably, the above scenario is seldom achieved. It is however, of interest to reach an understanding of the potential of the ERV and the impact which the development, over time will have.

Table 8

20 YEAR PROJECTION				
SELECTED ANNUAL PERCENTAGE GROWTH RATES				
TO EQUAL SUPPLY	3.5265%			
WEIGHTED AVERAGE DEMAND	GLA	% DISTRIBUTION	% GROWTH	WEIGHTED AVERAGE
Offices/Comm	475,751	41,74%	2,430%	1,0142%
Retail	287,752	25,24%	1,400%	0,3534%
Residential	239,223	20,99%	6,920%	1,4522%
Educational	137,183	12,03%	2,700%	0,3249%
TOTAL	1,139,910	100.00%		3,1448%

The indicated level of demand in the ERV precinct is calculated in Table 8. The percentage rate of growth for offices and residential respectively, is as reflected in the Tygerberg Spatial Development Framework : Economic Inputs (Urban-Econ, June 1998).

It is estimated that the weighted average demand percentage growth rate per annum in the ERV for offices, retail, residential and educational space, is 3.14%.

The growth rate for retail in the ERV is considered to be 1,4%, (0,26% Eastern Sector (op.cit) (as shown in Table 8), and the growth rate used for educational usage is 2,7%, which is equal to the current projected population growth for Tygerberg (op.cit.).

The average economic growth rate for Tygerberg over the period 1991-1995, has been estimated at 3.8% per annum (op.cit.).

It is also noted that the average economic rate for the Cape Metropolitan Area for the period 1991-1996, has been estimated at 2.8% (op.cit.).

Table 9 reflects the annual absorption of GLA as calculated, using the annual percentage growth rate required to take up the full supply over 20 years (3.53%) and the estimated average percentage growth in demand (3.14%), as referred to above.

The projected demand increases from 27 000 m² per annum in 1999, to 49 000 m² per annum in 2018.

Table 9

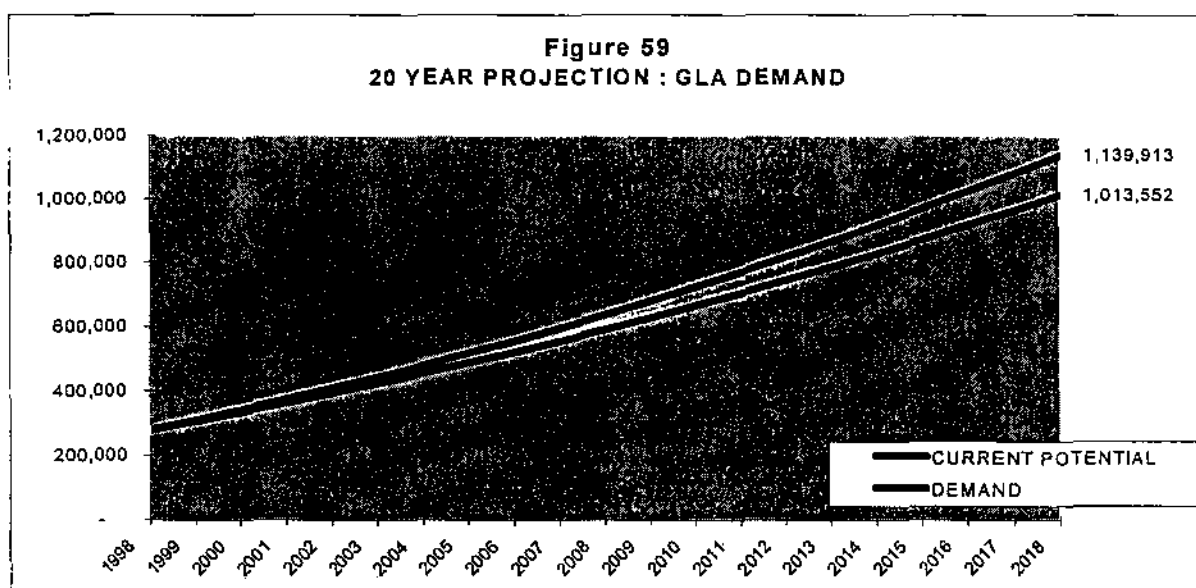
20 YEAR PROJECTION					
ANNUAL GLA : COMPARATIVE DEMAND					
	1999	2003	2008	2013	2018
TO ABSORB SUPPLY	30,365	34,880	41,480	49,328	58,662
ESTIMATED DEMAND	27,078	30,648	35,780	41,772	48,766

The accumulative demand is estimated to increase from 306 000 m² in 1999, to 1 017 000 m² in 2018. These amounts include the GLA built (Table 10).

Table 10

20 YEAR PROJECTION					
ANNUAL ACCUMULATIVE GLA : COMPARATIVE DEMAND					
	1999	2003	2008	2013	2018
TO ABSORB SUPPLY	309,219,1	441,772,3	635,516,0	865,917,4	1,139,912,6
ESTIMATED DEMAND	305,932,2	423,032,4	591,352,6	787,857,0	1,017,264,8

A projection, based on 3,53% and 3,14% growth per annum for office, retail , residential and educational space, projected over 20 years, is reflected in Figure 59 below.



15.4 Projected Cost Structures

The estimated cost of the existing built GLA, is R1.3b. The estimated cost of developing the remainder of the unbuilt GLA (Figure 58) is R3.8b over 20 years, expressed in present value rand.

The estimated cost distribution of the ERV, Durban Road, University of Stellenbosch, Sportika and Mini-Cape sites respectively, is shown in Table 11.

It should be noted that the cost of development includes land and professional fees and excludes VAT.

Table 11

20 YEAR CAPITAL GROWTH PROJECTION PRESENT VALUE COST STRUCTURES: FULL GLA	
BUILT BULK TO DATE	1,291,257,650
FUTURE	3,842,673,938
UNBUILT ERV	1,890,829,230
UNBUILT DBN RD	487,794,545
UNZONED U.S.	1,215,351,039
UNZONED MINI-CAPE & SPORTIKA	248,699,123
PROJECTED CAPITAL EXPENDITURE	5,133,931,589

The total capital investment, in present value rand, including the capital expended, is estimated at R5.1b, over a twenty year period.

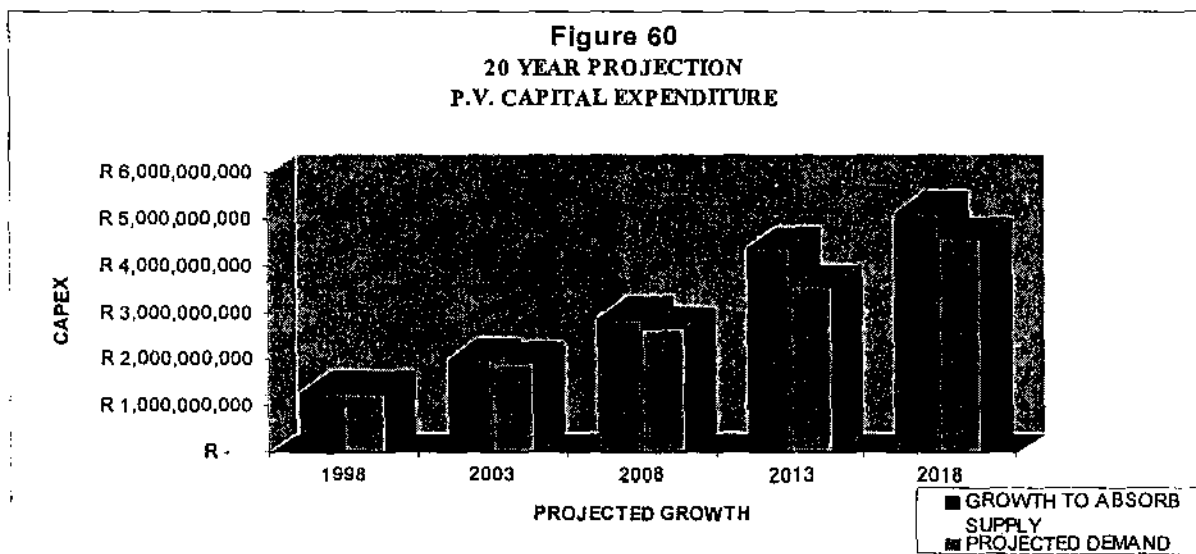
This also assumes the development of all the bulk over 20 years.

A comparison is drawn in Table 12, between the estimated capital expenditure, projected over 20 years, and calculated at the required take-up rate of 3.53% per annum and the estimated demand of 3.14% per annum.

Table 12

ESTIMATED PRESENT VALUE CAPITAL EXPENDITURE 20 YEAR SUPPLY AND DEMAND PROJECTION		
YEAR	BASED ON SUPPLY	BASED ON DEMAND
1998	1,291,257,650	1,291,257,650
2003	2,018,320,581	1,934,689,310
2008	2,882,949,309	2,685,859,566
2013	4,375,015,703	3,562,808,573
2018	5,133,942,896	4,586,97,193

The results of this comparison are illustrated in Figure 60.



15.5 Estimated Cost Of Off Site Landscaping And Additional Bulk Services

Table 13 sets out the estimated cost of landscaping and pedestrian linkages, electrical services and roads.

It is estimated that approximately 2.2km of pedestrian and cycling routes are to be built to complete the linkages between the development nodes.

The landscaping is mostly opposite the Santam building and the verge along Mispel Street. A covered walkway is envisaged along the length of Edward Street and provision is made for three overhead pedestrian linkages.

The electrical costs relate to the overhead cable to be relocated underground and aesthetic treatment to the sub-station on the Mini-Cape site.

The estimated cost of the half-diamond off-ramp from the N1 onto Carl Cronje Drive and the on-ramp is also recorded (BKS estimates). The cost of widening Carl Cronje Drive, adjacent to the Tyger Waterfront south to the N1, is included with the cost of the roads in Table 13.1

Table 13.1

ESTIMATED PRESENT VALUE COST OF OFF SITE LANDSCAPING AND ADDITIONAL BULK SERVICES		
LANDSCAPING AND PEDESTRIAN LINKAGES:		
Pedestrian & Route (2,2km. route : Doordekraal Dam to N1)		3,300,000
Landscaping (Carl Cronje Drive : Santam to Mispel Str. verge)		1,500,000
Covered Walkway (Edward Street)		560,000
Overhead Pedestrian Linkages (3 crossings)		1,080,000
Sub Total		6,440,000
ELECTRICAL SERVICES:		
Relocate overhead cable underground (Doordekraal to PP Smit)		5,600,000
Aesthetic treatment to Doordekraal sub-station		800,000
Sub Total		6,400,000
ROADS:		
Half Diamond Interchange and Road Widening (N1 Culvert to Mispel)		35,000,000
Sub Total		35,000,000
TOTAL		47,840,000

Discussions with the office of the Director of Engineering Services revealed that the existing provision for stormwater is sufficient. Water supply will however, have to be increased in future and a new reservoir constructed.

Table 13.2

CAPEX EXPENDITURE : 5 YEAR PROJECT PRIORITY						
PROJECT	(R,m)	1999/00	2000/01	2001/02	2002/03	2003/04
TOTAL						
ELECTRICAL SERVICES						
Replace Cable Underground (Doordekraal to PP Smit)	5,60	5,60				
Aesthetic Treatment of Doordekraal Sub-Station	0,80			0,80		
ROADS						
Half Diamond and Road widening (N1 Culvert to Mispel)	35,00		15,0	20,0		
LANDSCAPING						
Landscaping of Carl Cronje verge	1,50	0,20	0,30	0,50	0,30	0,20
Covered Walkway along Edward Street	0,56		0,56			
Overhead Pedestrian Linkages *	1,08		0,36	0,45	-	0,27
N-S Pedestrian Route (2,2 km; Doordekraal Dam to N1)	3,30	0,50	0,80	0,80	1,00	0,20
TOTAL	47,84	6,30	17,02	22,55	1,30	0,67

* Order of priority is:
 Bill Bezuidenhout Drive : Tyger Valley Centre to Sportika
 Carl Cronje Drive : Tyger Valley Centre to Mini-Cape
 Carl Cronje Drive : Tyger Waterfront to Santam

15.6 Job Creation

The estimated number of jobs created over the 20 year period is 75 500, based on 3.14% growth rate as reflected in Figure 61 and Table 14.

Approximately 60% of the jobs created will be temporary and are linked to the construction and allied industry, including professional services such as architects, structural and civil engineers and quantity surveyors.

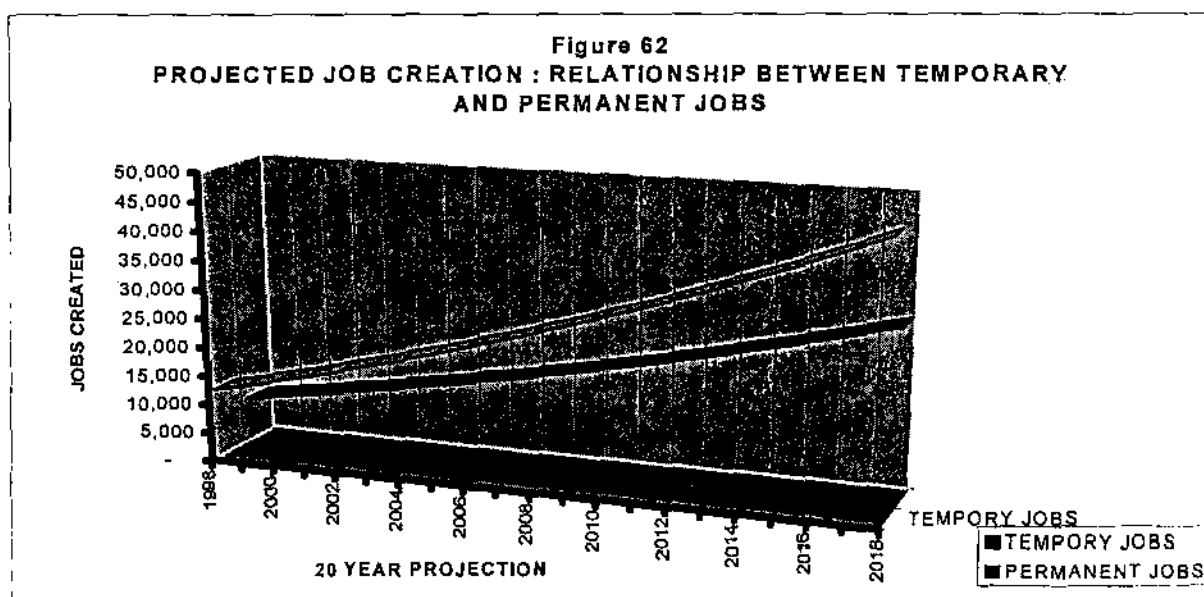
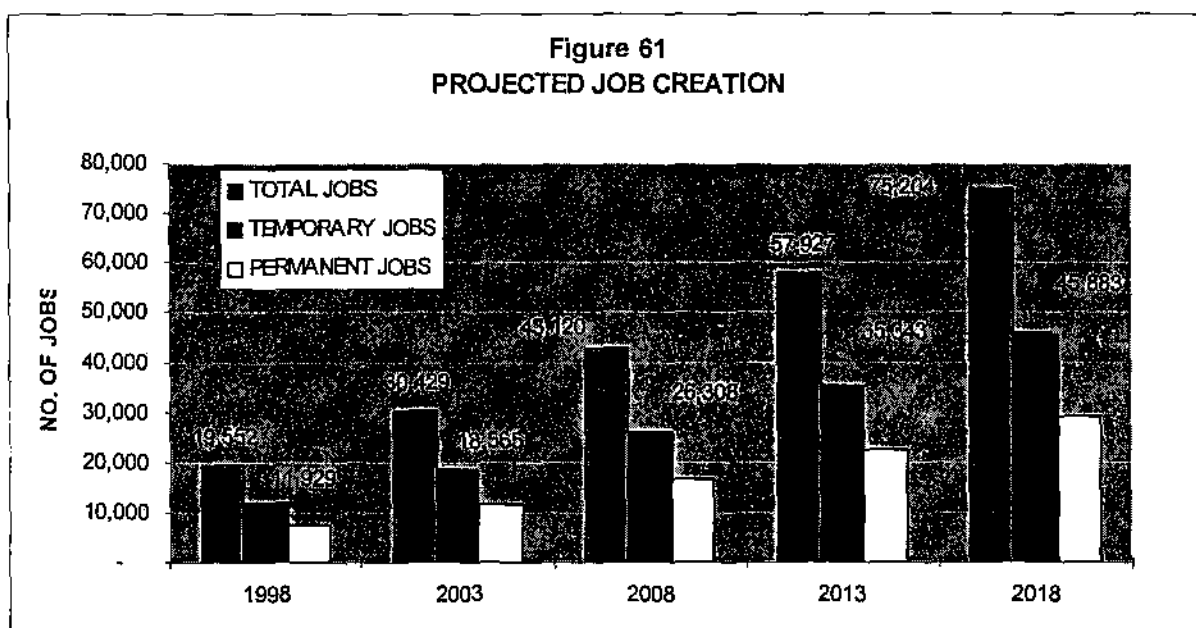
The estimated permanent jobs created will be taken up by office workers, restaurant, retail, hotel, leisure and recreational as well as workers engaged in repairs and maintenance, cleaning and security.

Table 14 sets out the estimated number of jobs created and a distribution between permanent and temporary jobs.

Table 14

20 YEAR JOB CREATION PERMANENT AND TEMPORARY JOBS			
YEAR	ANNUAL	TEMPORARY	PERMANENT
1998	19,552	11,929	7,623
2003	30,473	18,592	11,881
2008	43,223	26,371	16,852
2013	58,108	35,453	22,655
2018	75,485	46,055	29,430

Graphic representation is seen in Figure 61 below.



15.7 Source And Distribution Of Revenue

It is estimated in Table 15, that at the end of the 20 year projected development period, the annualised revenue which will accrue to the City of Tygerberg will be in the order of R94m, expressed in present value.

This revenue will accrue from rates and taxes, the sale of electricity and water and sundry charges.

The annualised present value revenue which will accrue to the private sector is estimated to be in the order of R70m arising from the management and maintenance of property.

The present value of VAT over the 20 year period is estimated at R578m arising from transactions related to construction and services. It is further estimated that R5.6m will be paid to the City of Tygerberg for plan approval and zoning application fees.

Table 15

REVENUE DISTRIBUTION		
	FEES & TAXES	ANNUAL
Private Sector Revenue		70,113,667
City of Tygerberg Revenue		94,481,046
Municipal Fees (Plan Approval & etc)	5,598,939	
Central Government	580,278,913	
	585,877,852	164,594,713

15.8 Sector Growth Distribution To Target 6% Growth Per Annum (The "High Road" Scenario)

Table 16 isolates the three main land uses and the estimated percentage growth per annum for ERV.

For example, the growth rate estimated for office, retail and residential is 2.43%, 1.4% and 6.92% respectively.

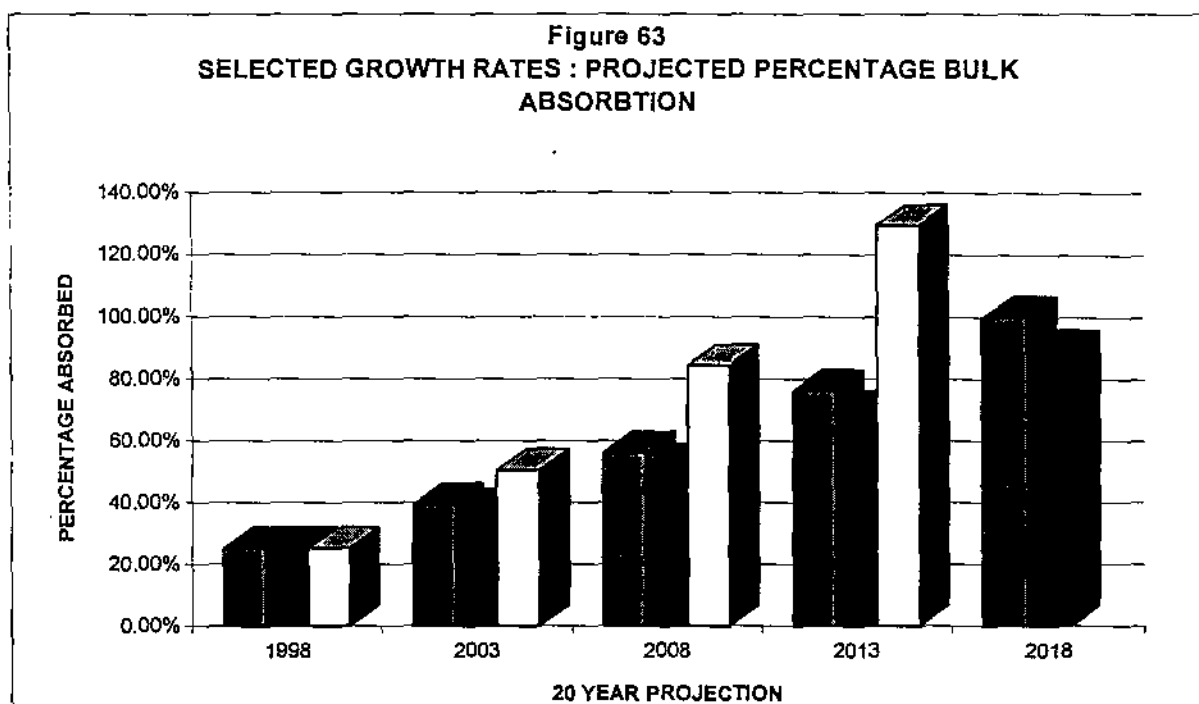
To achieve a 6% annual growth in the ERV in line with the objectives of GEAR, the development of offices and retail would need to be targeted for approximately 5% and 6% respectively. There appears to be capacity for leisure and entertainment as well as speciality retail. Furthermore, the development of residential units should be encouraged beyond the 6.9% annual growth currently estimated (Urban-Econ, June 1998), to at least 10% (see paragraph 15.10).

Given the location and surrounding facilities, the low base from which it is starting (see Figure 58) and the shortage of housing (op. cit.), it may be attainable.

Table 16

SECTOR GROWTH DISTRIBUTION TO ACHIEVE 6% GROWTH P.A.						
	GLA	% DISTR.	% GROWTH	WEIGHTED AV	GROWTH TO ACHIEVE 6% TARGET	
Offices/Comm	475,751	41,74%	2.43%	1.014%	5.00%	2.088%
Retail	287,752	25,24%	1,4%	0.353%	6.00%	1.514%
Residential	239,223	20,99%	6.92%	1.452%	10.00%	2,099%
Educational	137,183	12,03%	2.70%	0.325%	2.70%	0.324%
	1,139,910	100.00%		3.144%		6,025%

Current high interest rates on mortgages and loan capital will have a serious impact on all building activity, particularly home building, unless the matter is rectified soon.



15.9 Overview : The Foundation To Sustained Growth

The above analysis and the observations contained in the Urban-Econ 1998 report, clearly demonstrate the following:

- ♦ The ERV is located in an uniquely successful decentralised development node with the following characteristics :
 - It accommodates the most successful regional shopping centre in the country (Urban-Econ 1998, p15))
 - It is seventh in the top ten fastest growing decentralised office nodes in the country– (op.cit. page 33)
 - It boasts a high gross geographic product (GGP) – (op.cit)
 - It is an affluent area with an estimated economic annual percentage rate of growth of 3,8% for the period 1991 – 1995 (op.cit)
 - Its development potential is based on excellent geographic location in respect of transport linkages and expanding markets in the Western Cape such as:
 - Tourism;
 - Decentralised offices;
 - Leisure;
 - Speciality focussed markets;
 - Health (doctor's rooms, private clinics and specialist clinics);
 - Academics, management and research centres;
 - Sport and recreation; and
 - Residential.

- ◆ With the exception of the current road capacity, particularly Carl Cronje Drive and Durban Road, the existing bulk services are expected to accommodate planned development expansion, without the outlay of major finance to pay for increasing the capacity of the existing infrastructure.
- ◆ The ability to generate jobs, particularly within the construction and allied disciplines. Whilst an estimated 60% of the jobs created will be temporary, it does pave the way for an estimated permanent 30 000 jobs over the projected period of 20 years.

15.10 The High Road Scenario

The high road scenario, postulates the probability of achieving a 6% average rate of growth per annum in ERV.

The underlying conditions precedent to this target are contained in Table 16.

It becomes evident that the stimulation of the residential market, to a targeted rate of growth of 10% per annum, is intrinsic to achieving the overall rate of growth of 6%. The current estimated demand for residential is 6,932% (Urban-Econ, 1998) and it is suggested that the environment and quality of life within the ERV is conducive to stimulating growth in the residential market to at least 10% per annum.

The enhancement of the natural environment with well planned landscaping and pedestrian linkages, forms an important element in this strategy. The cost of the above improvements are estimated to be R6,44 m as reflected in Table 13.

The 6% growth per annum, postulated for retail is significantly higher than the estimated demand (1,4%), see Table 16. However, as mentioned above, if niche markets opened up, particularly through expanding tourism and supportive festive retail, there could be an increased demand for leisure related speciality retail. This opportunity should be grasped.

The importance of the Velodrome should not be under estimated and the synergies which are latent in large events, sport, recreation, conference, exhibition and retail, should be explored and incorporated into the overall growth strategy. The importance of security, shared parking and pleasant linkages becomes evident.

The doubling of the estimated growth rate of 2,43% for offices and commercial to a 5% growth rate per annum (see Table 16), could prove to be the real challenge.

The "knock-on" demand, which will be created by retail and residential expansion, will contribute largely to achieving the targeted 5% growth for offices. Improved access, parking, convenient sporting and retail facilities coupled with good linkages, will further enhance this already popular and successful decentralised office node. This will generate further demand and attract investment.

A further consideration is to carefully monitor demand for space within the retail, office and residential sectors. An equilibrium could be obtained by synchronising those areas for which demand has dropped, for good reasons, to usage for which there is a healthy and sustained demand. This strategy should be followed within the overall urban plan for the ERV.

A sustained average rate of growth of 6% per annum in the ERV will absorb all bulk within 12 years (see Figure 64). This will result in shifting investment forward by 8 years and will place great demands on the construction industry and the already built environment.

The "high road" scenario will further highlight the need for a growth management plan.

It is typical for an economic overview to raise more questions than it provides answers. This study is no exception.

For example, what impact will other developments in the Cape Metropolitan Area have on the ERV, particularly on retail and office space? How will Century City and the Okovango Centre affect the ERV?

This study has postulated three scenarios including sketching an economic composition to achieve the "high road" scenario. It is evident that given the nature of the brief and constraints under which this study took place, particularly time, more in depth research needs to be made.

It is suggested that such research would have the foundation for developing a policy, programming and budgeting framework within which to formulate a marketing and project implementation strategy for the further development of the ERV.

16.0 MANAGEMENT PLAN

16.1 Management Objective

The desire has been expressed by the major property owners in the ERV study area to achieve a "seamless" management structure for the area, similar to that existing in the V&A Waterfront (V&AW) project. This "seamlessness" relates both to area management services and capital improvements in the public environment. The property owners wish to apply the benefits of the "V&AW management model" to the ERV study area.

One of the V&AW's key success factors is that the entire 103ha property is under a single ownership and also has a single management structure. This achieves benefits with regard to management services such as safety and security, maintenance, cleansing, promotions and special events. Benefits are also achieved with respect to capital improvements in the public environment, such as street furniture, landscaping, signage and special lighting.

These V&AW benefits are, in part, derived from the development agreement that exists between the Cape Town Municipality and the V&AW. In terms of the agreement, the V&AW can itself render selected municipal services within its area and receive an "agency payment" in respect thereof from the Municipality. This enables the V&AW to operate services at higher standards than the normal municipal standards and also ensures the management of services delivery.

Can the benefits of this "seamless" management model be realised in the ERV study area, where the base conditions are multiple property ownership and multiple management structures?

16.2 BID Concept

A proven management structure that can assist in achieving "seamless" management in a multiple property ownership situation is that of a Business Improvement District (BID). A BID is an organising and financing mechanism used by city authorities, property owners and merchants to determine the future of their retail, commercial and industrial areas.

The BID must be legally constituted and in the United States of America a local law is passed which permits the local authority, property owners and merchants to band together to use the city's tax collection powers to "assess" themselves. The funds are collected by the City and returned in their entirety to the BID for use in purchasing supplemental services (e.g. maintenance, security, promotions and special events) and capital improvements (e.g. street furniture, landscaping and signage), beyond those services and improvements provided by the City.

The BID concept was introduced for the first time in New Orleans, in 1974. Since then, over 30 000 such special districts have been designated in cities throughout the USA and Canada. BIDs are also now being introduced in British cities, with Coventry notably having introduced a town centre management initiative.

The first BID to be introduced in South Africa was initiated through the efforts of the Central Johannesburg Partnership in 1994. Since then, four such districts have been established in Johannesburg and another three are under investigation. The Central Johannesburg Partnership is a Section 21 Company.

Significantly, the first local legislation in support of the BID concept was passed by the Gauteng Provincial Legislature in December 1997. The accompanying regulations are currently being finalised and will provide a rigorous procedure that must be followed when relevant stakeholders wish to establish a BID. The area must be accurately defined, services to be provided must be identified and a budget prepared to reflect the resultant costs to property owners by way of a levy. The intention to declare a BID is advertised and all affected property owners are notified. Application to a local authority to establish a BID may be made by 25% of property owners, but approval will only be given if 51% or more of the relevant property owners are in agreement. Once a BID is authorised, 100% of property owners within the District are obliged to contribute financially.

The main benefits of the BID concept are seen as the following :

- Supplementary government services (e.g. security, cleansing, maintain parks/public spaces);
- Non-government services (e.g. marketing, promotions, advertising);
- Advocacy services (e.g. enable businesses to speak collectively to promote unified local positions);
- Co-operative enterprises (e.g. joint advertising, purchasing of services);
- Capital improvements financing (e.g. streetscaping); and
- Research and planning services (e.g. economic/demographic data, development goals/ programs).

The fact that property owners in the ERV study area have already voluntarily established the ERV Partnership is considered to be a sound platform from which to pursue, initially, a formally constituted association, which could be the forerunner of a legally constituted ERV BID. This approach will hopefully retain the momentum and co-operation established through this study, whilst allowing time to create an enabling statutory and legal framework within which to establish a BID in the Western Cape Province. The City of Tygerberg should actively support the lobbying for such legislation, which is being promoted by the Cape Metropolitan Council and the City of Cape Town.

Figure 64 illustrates the concept and interactivity required for a successful BID in the ERV area.

BIDs are not a panacea for the economic growth and prosperity of city districts. However, as a successful urban management model based on a public/private sector partnership, it has proven itself both internationally and locally.

Recent research on the subject by the London School of Economics concluded the following :

"The motivation for property owners to establish a BID and thereby impose a compulsory levy on themselves is that the expected commercial return will exceed their personal contribution.

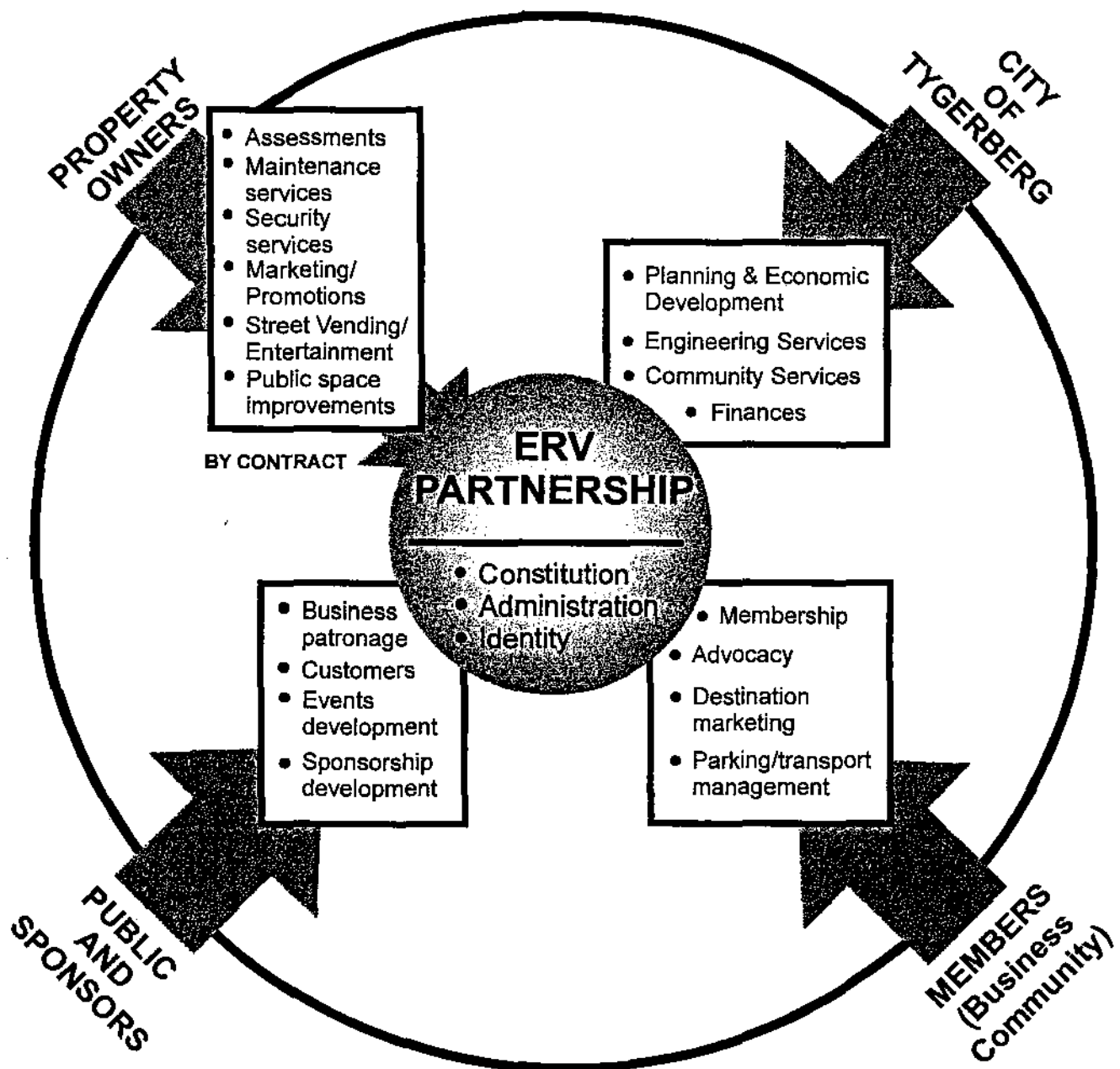
The growth in BID formations across the United States reflects the recognition by property owners that the value of their asset (i.e., their property) depends to a significant extent on the surrounding environment... In promoting their commercial self-interest, property owners will be prepared to invest in their surroundings to the extent that it benefits their property. In practice this means that property owners will only be willing to join a collective scheme — such as a BID — if there is agreement on which aspects of local environmental decline need to be tackled and how this should be approached."

The BID concept gives business people the opportunity to make decisions regarding the economic environment in which they function. As such, it should be considered a key ingredient for a successful urban growth management plan for the ERV study area.

16.3 Management Policy

In view of the potential benefits of a BID, the policy for managing the ERV is:

- ♦ An organisational structure similar to that of a Business Improvement District (BID) should be established in order for the ERV Partnership to control and manage development in the ERV for the benefit of all ERV Partnership members.
- ♦ A safety and security plan should be prepared to ensure the management of activity and movement within the area.



17.0 CONCLUSION

17.1 Issues for Consideration

The competitive advantage which the ERV enjoys by virtue of its unique environment and metropolitan location has been enhanced with the establishment of the ERV Partnership. This Partnership had led to the formulation of policies for future development and growth; the first step towards a strategic development and growth management plan for the ERV. If formally constituted as indicated in Figure 64, the ERV Partnership would have the ability to implement strategic plans and so enhance the special attributes of the area. It is this vision which could secure the long term sustainability of the area. By promoting development in the area, the rates base of the local authority would grow, employment would be created and the local authority would be in a better position to provide services and facilities in previously disadvantaged areas.

In this report the river system has been identified as a key component of the Development Framework plan. It is this element which could distinguish the ERV from other office nodes in the metropolitan area and therefore it should be protected and enhanced. With careful planning and management the natural river system could become the symbol of the ERV. In this report there are policies which, if implemented, could realise this objective.

The policies are also issues which the ERV Partnership must address in order to achieve the above goals. Most importantly, the ERV Partnership must address:

- ◆ The amount of development bulk to be granted to unzoned properties;
- ◆ The rezoning of properties beyond the commercial centre of the ERV;
- ◆ The implementation of shared parking areas;
- ◆ The implementation of strategic pedestrian routes and east-west links;
- ◆ The compilation of an environmental management plan, incorporating a continuous pedestrian route, for the natural corridor;
- ◆ The review of the sub-regional transport network;
- ◆ The implementation of improved vehicular access to the area;
- ◆ A satisfactory mechanism for disposing of and for developing City land; and
- ◆ An organisational structure which facilitates efficient management of development and growth in the ERV.

17.2 The Way Forward

It is intended that this Development Framework document will form the basis for decision-making on the above vital issues affecting the future of Elsiekraal River Valley.

As the first step towards implementing Development Framework policies, this report will need to be endorsed by the City of Tygerberg. Thereafter, it is the responsibility of the ERV Partnership to establish the appropriate organisational structure in order to plan and develop the ERV to its maximum potential.

ANNEXURE A
Stormwater System
Ninham Shand

Report

ERV PARTNERSHIP
ELSIESKRAAL RIVER VALLEY
SYNOPSIS OF AVAILABLE INFORMATION
MAY 1998



NINHAM SHAND
CONSULTING ENGINEERS

CAPE TOWN

ELSIESKRAAL RIVER DEVELOPMENT THROUGH TYGER VALLEY STORMWATER AND WATER QUALITY MANAGEMENT

In May 1997 Ninham Shand undertook a water quality and stormwater investigation for the proposed Tyger Waterfront Project, for Tyger Waterfront (Pty) Ltd. The proposals from that study would have a major influence on the Elsiekraal River Valley. The Tyger Waterfront (Pty) Ltd have subsequently sold a portion of their property to Monex, but their proposals are referred to hereafter as the Tyger Waterfront or Waterfront.

The Elsiekraal River drains the partially urbanised upper Tygerberg Valley and flows through the Doordekraal Dam and the proposed Tyger Waterfront Developments into the Bellville Park quarry detention dam and thence under the N1 Freeway. The catchment contributing to flow in the river and the layout of the "Stormwater" model used for the area, are attached as Figures 1 and 2 respectively.

Figure 3 is compiled from a plan provided by MLH. This is marked up with the main features and components of the stormwater system relevant to the river and with the Tyger Waterfront proposals. These features are discussed on a reach by reach basis below:

Reach 1: Van Riebeeckshof Road to proposed Tyger Waterfront development

The Elsiekraal River crosses Van Riebeeckshof Road immediately upstream of the Doordekraal Dam. Spillway discharges from this dam are limited to approximately 3 m³/s before the main unlined spillway comes into operation. The river then flows through a tract of undeveloped land to the Tyger Waterfront property. Care should be taken to limit development along this reach to outside the 1 in 50 year flood line. This flood line has not yet been determined. Both the small road bridges along this reach of river are of inadequate capacity.

Dambreak flood lines are irrelevant with regard to proposals for development downstream of the dam and should therefore be ignored. They are, however, vital from the point of view of appropriate evacuation planning in the event of an impending dam failure. In fact they should be determined for the distance down the river beyond which they will have no further significant effect, which would be several kilometres.

Reach 2 : Proposed Tyger Waterfront development including

Subreach 1 : Welgemoed golf course catchment to northern quarry.

Subreach 2 : South west of northern quarry to Waste Tech bridge and

Comments on Water Quality

Reach 2

The Elsieskraal river presently flows through a temporary diversion channel over the Waterfront Property before crossing to the east of Carl Cronjé Drive by means of the original culvert. This diversion channel only has sufficient capacity to pass small floods. It follows the route of the planned waterway to pass major floods from the northern boundary of the proposed Waterfront Development into the northern quarry. The early construction of the diversion was necessitated by the need to lay the new sewer across the existing river channel in accordance with the planning proposals for the Waterfront Development.

Low flows of up to 3 m³/s in the Elsieskraal River would be intercepted and returned to the existing river channel via a large diameter pipe culvert to prevent pollution of the northern quarry water body. Floods would discharge into the northern quarry via the 220m long waterway, the water surface of which would be partially navigable by small craft. The height difference in the topography along the waterway would in part be addressed by the construction of a long weir across the waterway at an oblique angle.

It was originally proposed that a labyrinth weir be constructed at the south western side of the northern quarry to discharge floodwaters and to limit the water level increase in the quarry. As the former southern quarry has recently been land filled it is now likely that this weir will be located at the south eastern corner of the northern quarry to discharge into a new channel on the western side of Carl Cronjé Drive.

Although it would have been desirable to reinstate the river to a more natural condition over the Tygerberg Waterfront site, the high flow velocities, potential for erosion and space limitations of the development precluded this option.

Subreach 1

The stream draining the Welgemoed Golf Course catchment flows over a waterfall before entering the northern quarry. This quarry presently has no formal spillway and will in the event of a large flood either

spill near the northern side or over the newly land filled area to the east before joining the Elsieskraal River downstream of the lower Carl Cronjé Drive culvert.

Subreach 2

In order to control water quality it was proposed that the Welgemoed Golf Course River base and flood flows coming from the Golf Course Dam (subreach 1) be diverted away from the northern quarry to downstream of the proposed labyrinth spillway. The low flows and floods would then have flowed through a proposed waterway (subreach 2) and the recently land filled southern quarry to rejoin the existing Elsieskraal River. As mentioned above it is understood that the current plan is to pass the flood flows from both rivers through the northern quarry by relocating the labyrinth weir close to Carl Cronjé Drive.

Comments on water quality in the northern quarry

At present, the water quality of the Elsieskraal and the Welgemoed Golf Course Rivers is typified by nutrient enrichment, elevated turbidity, and the abundance of floating and planktonic algae. The quarry shows *E.coli* contamination, nutrient enrichment, increased turbidity, and the potential for becoming infested with floating and planktonic algae and rubbish. Application of the water quality guidelines for recreation shows that the quarry is not ideally suited to full contact recreation (ie swimming and wind surfing), but is suitable for non-contact recreation (ie all activities where there is no bodily contact with the water).

In addition, runoff from the Tyger Waterfront could also increase nutrient concentrations, suspended matter, rubbish, soaps, oils and grease in the quarry. Water quality management is therefore essential to maintain acceptable water quality in the quarries. Ideally both the Elsieskraal and Golf Course Rivers should be diverted around the quarry but high costs and space limitations preclude this option. Diverting the Welgemoed Golf Course River low flows away from the northern quarry and directly into the Elsieskraal River would provide some benefit. Likewise the diversion of low flows in the Elsieskraal River would also be of benefit. The flood flows may still adversely affect water quality even if the measures described below are implemented.

A number of other measures should be implemented to maintain the quality of water in the large quarry where the first phase development of the Tyger Waterfront would take place:

- An artificial waterfall would be an attractive feature and also serve to recirculate and aerate the water.
- Water would also be circulated over the weir in the proposed Elsieskraal waterway.
- Litter and oil traps should be provided and a small boat used continuously to remove litter and any floating algae and to implement other control measures.

In addition the cooperation of the Tygerberg City Local Authority and of residents in the upstream catchment areas should be sought to control litter, pollution and aquatic vegetation and algae in ponds and dams.

It was recommended that a stormwater management "Action Plan" be set up to examine the stormwater management and water quality needs during the design phase, construction phase, and post construction period and describe the specific activities to be carried out by Tyger Waterfront and Tygerberg City.

Reach 3 : Tyger Waterfront to Bellville Park quarry detention dam

Once the river crosses to the east of Carl Cronje Drive via a culvert it remains on the eastern side of the road, crosses the Santam access road and continues on the eastern side of the road before crossing Carl Cronjé Drive for the second time. Clearing of vegetation and silt from the river course is urgently required from both the upper and lower Carl Cronjé Drive culverts, as well as at the Santam access road culvert. All three of these existing culverts are presently undersized. Carl Cronjé Drive will be subject to flooding until the proposed waterway into the northern quarry and further downstream is constructed. In the mean time the flooding potential will be aggravated if these culverts and the river course are not maintained.

It should also be noted that the construction of a second carriageway on the northern side of the existing Carl Cronjé Drive would in part take place over the route of the present river course. After recrossing Carl Cronjé Drive the river flows adjacent to the road before crossing the Waste Tech access road and discharging into the Bellville Park Detention Pond. The existing reach of the River to the East of Cronjé Drive is heavily overgrown and requires upgrading. The existing Waste Tech culverts are also slightly undersized.

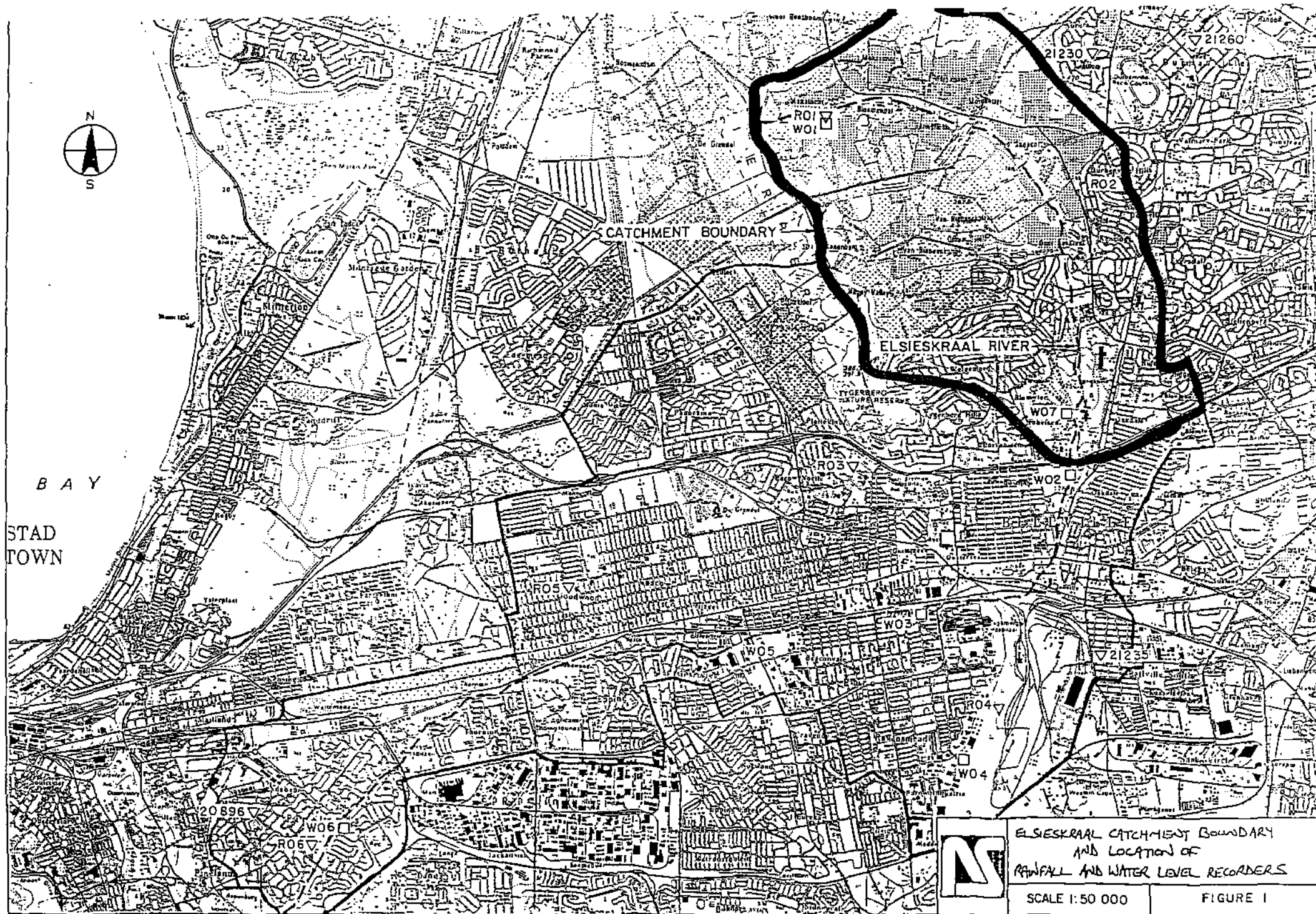
After construction of the proposed second Carl Cronjé Drive carriageway, space limitations would probably preclude the creation of a channel on the eastern side of this road to pass major floods. Therefore, the options for passing floods appear to be to construct a channel or culvert on the western side of Carl Cronjé Drive to join the existing river channel which would need to be upgraded, or to construct a culvert under the second Carl Cronjé carriageway also to join the existing upgraded river channel. Low flows could continue to flow in a channel on the eastern side of Carl Cronje Drive, but the existing channel would have to be modified to accommodate the second carriageway.

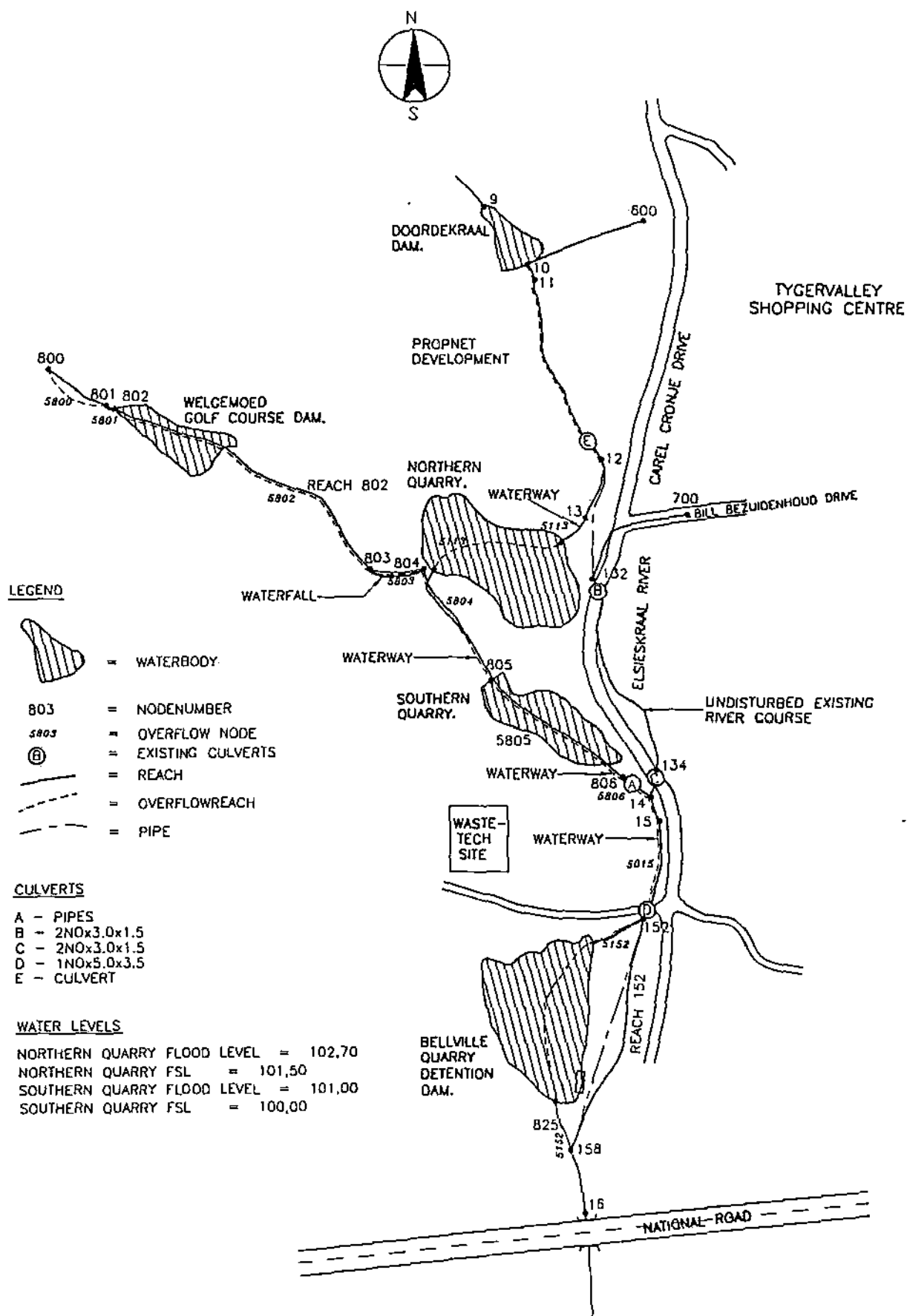
Reach 4 : Bellville Park Quarry detention dam to N1

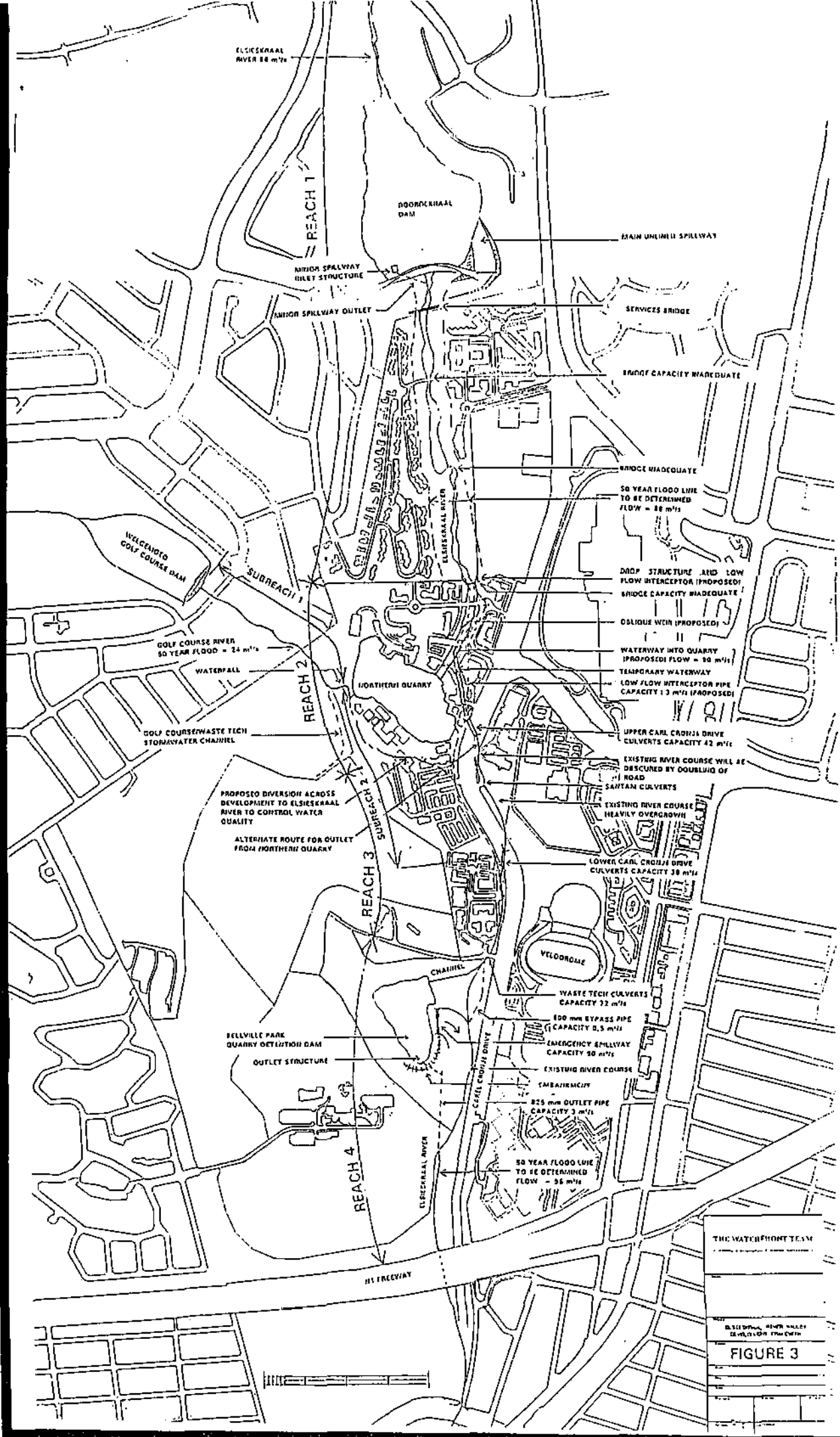
The entrance channel to this detention dam commences directly downstream of the Waste Tech bridge. At this point a 600mm diameter bypass pipe culvert commences and diverts low flows around the eastern side of the quarry, discharging back into the river opposite the detention dam's emergency spillway.

The detention dam's outlet pipe culvert commences at the southern end of the detention pond and discharges back into the river some 300m further south. The emergency spillway will operate during floods larger than about the 1 in 30 year flood and excess flow will discharge into the river where the bypass pipeline also joins it. The capacity of the river channel between the emergency spillway and the Golf Driving Range is estimated to be less than 10m³/s and widespread flooding would occur.

A 1 in 50 year flood line over this area would have to be determined before further development takes place. The flow from this point passes the Golf Driving Range and thence under the N1 Freeway.







ANNEXURE B
ERV Traffic Modelling
Jeffares & Green

Traffic Modelling

1. Background

The purpose of the traffic modelling exercise was to determine the impact of the expected growth in through traffic and the proposed land-use changes in the Elsiekraal River Valley (ERV) on the existing and preferred future road network. It is therefore an impact assessment on a macro scale and should not be confused with a traffic impact assessment (TIA) at the micro level. Each individual development will therefore still require a detailed TIA as required by the authorities prior to the granting of additional development rights and/or changes to the access arrangements.

To achieve this, use was made of two traffic simulation models:

- a) EMME/2 is a regional traffic model that was developed to simulate traffic flow in the Cape Metropolitan Area. This model was used to project traffic growth for the future 10 and 20 year scenarios. The projected growth served as input to the SATURN traffic model to simulate the growth in through traffic in the study area.
- b) SATURN is a traffic assignment and simulation model that is able to model traffic at a detailed (up to individual intersection) level. The findings of the ERV traffic modelling are primarily based on the output of this corridor model. It should be noted that the modelled study area is larger than the ERV study area in order to include all the road links in the Durban Road development corridor. These roads operate as a system and should be analysed as such. The SATURN study area is depicted in Figure 1.

2. Land-use and Traffic Growth Scenarios

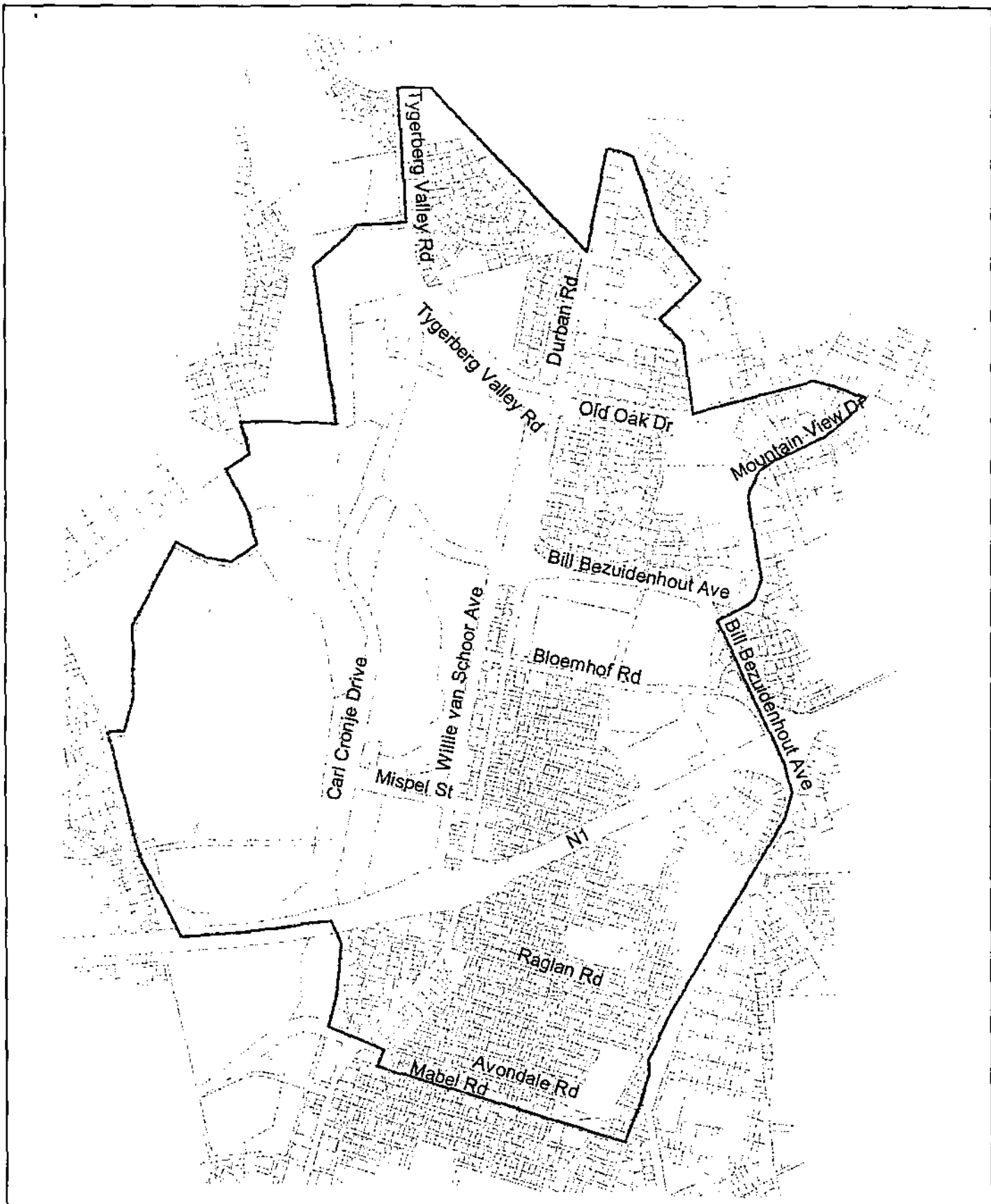
Four ERV land-use development scenarios and three traffic growth scenarios were developed for testing with the SATURN model. Combinations of these scenarios were assigned to the current and future road network in the study area to determine the traffic impact within the study area resulting from internal land-use changes and external traffic growth.

2.1. Elsiekraal Valley Development Scenarios

- | | |
|-------------|--|
| Scenario 1: | The 1996 base year matrix updated to 1998. |
| Scenario 2: | Scenario 1 matrix plus additional bulk rights which are currently not taken up. |
| Scenario 3: | Scenario 2 plus development on the Mini Cape, Sportika and University of Stellenbosch sites. |
| Scenario 4: | Scenario 3 plus full development of University of Stellenbosch site. |

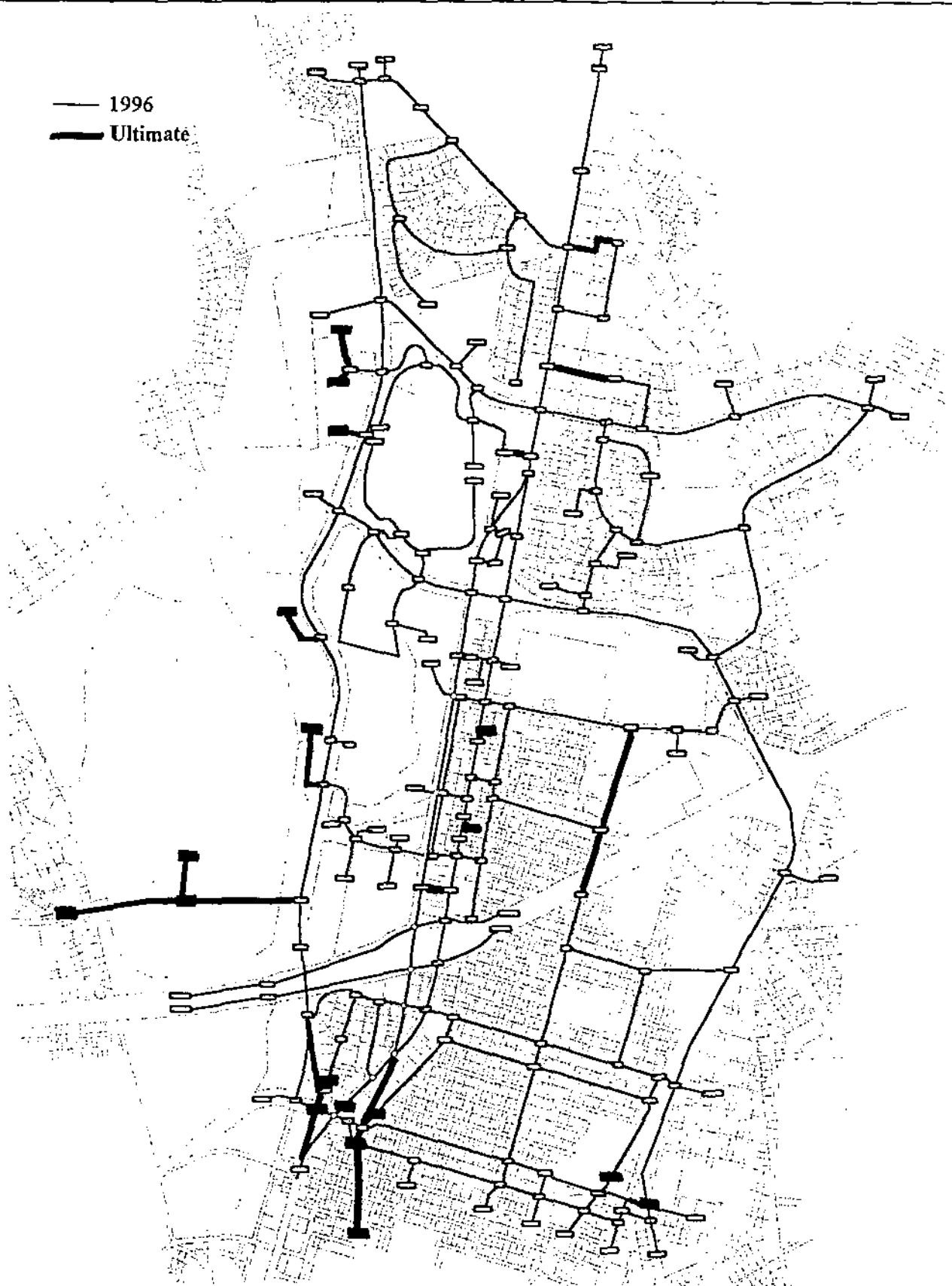
2.2. Traffic Growth Scenarios

- | | |
|-------------|---|
| Scenario A: | Existing (1998) through traffic |
| Scenario B: | 30% increase in existing through traffic to represent 10 year future horizon. |
| Scenario C: | 60% increase in existing through traffic to represent 20 year future horizon. |



 <i>Elsieskraal River Valley</i> PARTNERSHIP THE WATERFRONT TEAM	ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK SATURN Traffic Model Study Area		N.T.S Appendix B: Figure 1
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— 1996
 — Ultimate



THE WATERFRONT TEAM

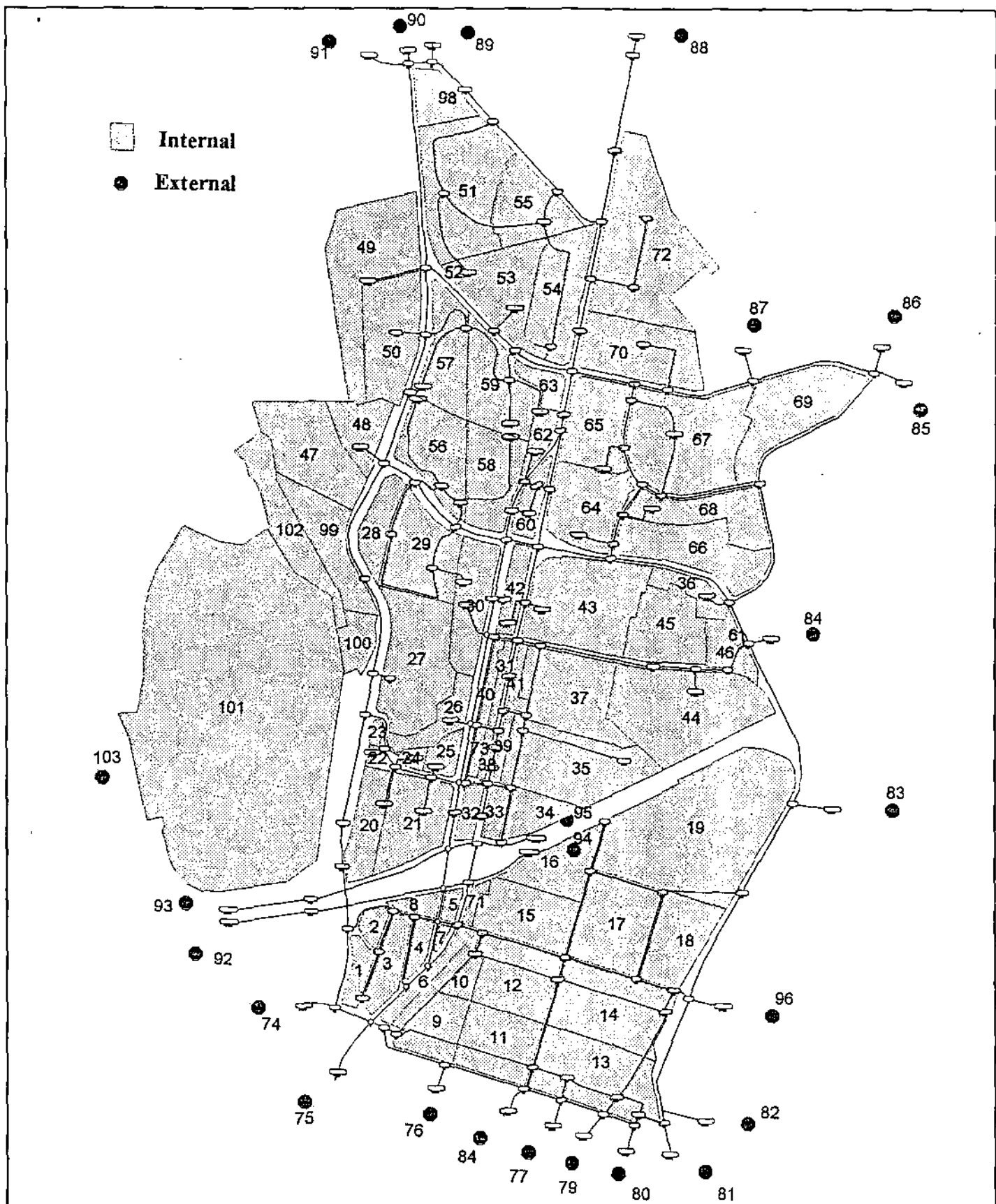
ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK

Modelled Road Links



N.T.S

Appendix B:
 Figure 2



 ERV <i>Elsieskraal River Valley</i> PARTNERSHIP THE WATERFRONT TEAM	ELSIESKRAAL RIVER VALLEY DEVELOPMENT FRAMEWORK SATURN Zone System with 1996 Base Network		N.T.S Appendix B: Figure 3
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3. Trip Generation

In order to simulate the impact of changes in the land-use on the road network, land-use proposals had to be converted to the number of vehicle trips which is generated during the AM peak hour. To do this, trip generation factors were applied to "units" of land use. In the case of office and commercial (retail) developments these "units" are measured in terms of gross lettable area (GLA), whereas residential developments are measured in terms of the number of housing units. Trip generation factors, which were applied to internal development Scenarios 1 through 4, are presented in Table 1. As stated in Section 1, the EMME/2 metropolitan traffic model was used to estimate the changes in through traffic. The output of this model was therefore used to adjust the number of through trips for external growth Scenarios A, B and C.

Table 1: Trip Generation Factors for AM peak hour

TYPE OF LAND-USE	AM PEAK HOUR VEHICLE TRIPS	PRODUCTIONS	ATTRACTIONS
Office ¹⁾	2.3 per 100 m ² GLA	15%	85%
Business ²⁾	0.8 per 100 m ² GLA	30%	70%
Residential ¹⁾	1.1 per housing unit	75%	25%

Sources:

- 1) Department of Transport
- 2) Jeffares & Green Inc. (Based on AM peak hour trip generation at Tyger Valley Center.)

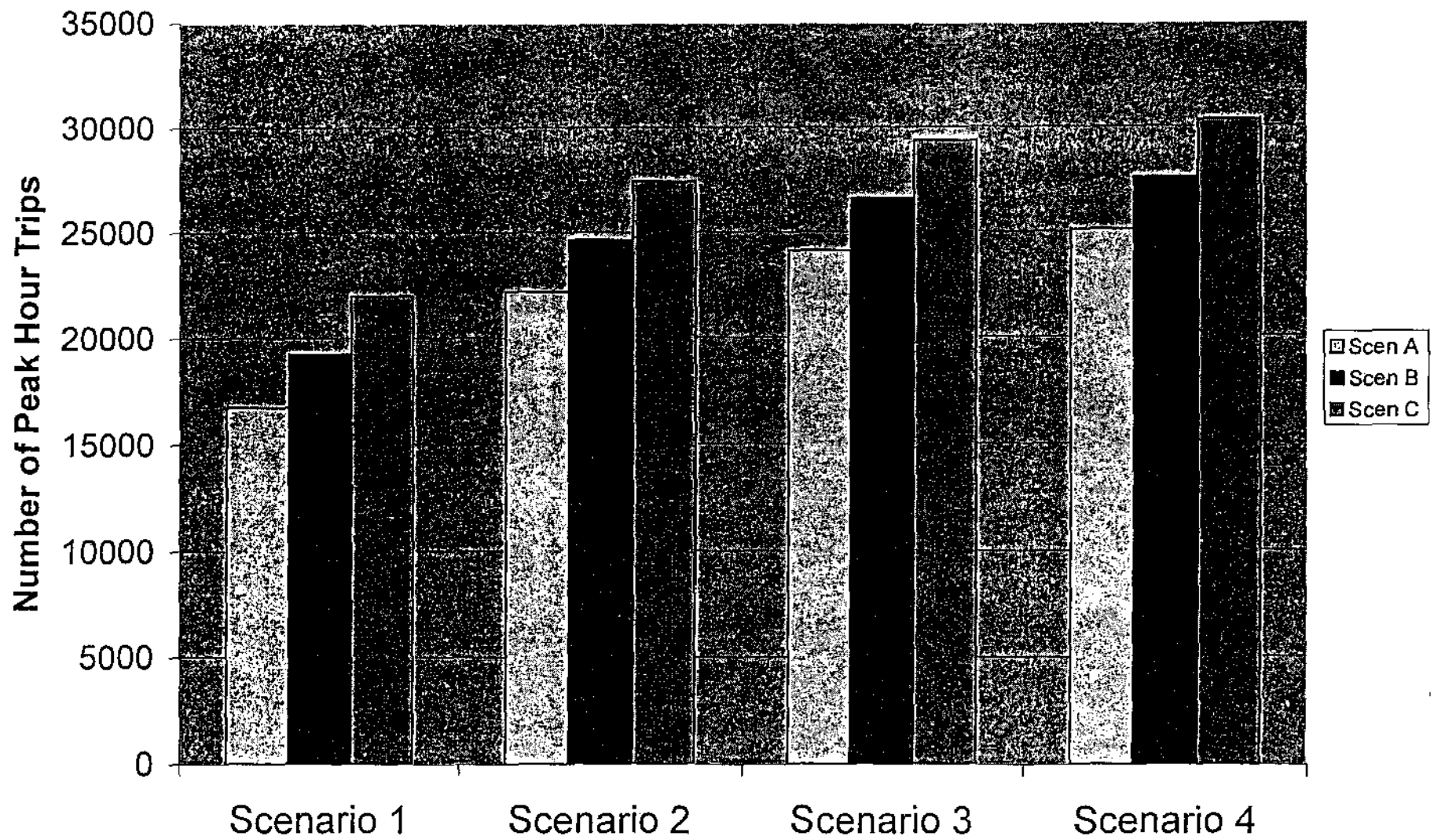
Above trip generation factors were then applied to the land-use changes in each geographical zone (see Figure 3) in order to arrive at the adjusted number of trips generated in that zone. The total number of internal and external trips generated in the entire SATURN study area is presented in Table 2 and Figure 4.

Table 2: Total vehicle trips generated during the AM peak hour

	SCENARIO 1	SCENARIO 2	SCENARIO 3	SCENARIO 4
Scenario A	16 751	22 173	24 110	25 093
Scenario B	19 222	24 644	26 581	27 565
Scenario C	21 968	27 390	29 327	30 310

Taking into account that the above trips are for the AM peak hour and that commercial trip generation is highest during the PM peak, and the fact that not all the internal trips may realize because not all bulk is likely to be taken up, the following can be concluded:

- a) The increase in the total number of trips resulting from the growth in traffic over 20 years is almost similar to the potential increase in trips due to existing bulk rights which has not yet been taken up. Existing unused bulk rights therefore could have a greater impact on traffic flow in the corridor than the growth in external traffic.
- b) The impact of additional bulk rights on current traffic flow is substantially less than that of approved rights in 20 years. Growth in through traffic therefore has a far greater impact on traffic flow in the corridor than that of additional trips that could result from the granting of further bulk.



- c) Trip generation in the SATURN study area will almost double in 20 years if all the existing unused and the assumed new bulk rights are taken up during this period. If all these trips are to be accommodated at existing levels of service, it means that capacity of the road network in the study area will also have to double.
- d) If the existing levels of service are to be retained in order to ensure the long term viability of developments in the corridor, then both the growth in external trips has to be restricted and the growth in trips generated within the study area has to be restrained. Due to the fact that the biggest potential traffic impact of development within the corridor results from bulk rights that have already been approved, rather than the assumed new rights, (see point (a) above) limiting the growth in through traffic offers potentially the biggest scope for maintaining an acceptable level of service on the road network in the study area.

4. TRIP DISTRIBUTION

All trips within and through the study area by definition require an origin and a destination. Origins and destinations are defined as geographical areas that are termed "zones". The SATURN model includes 103 zones, 78 of which are internal to the primary study area, as shown in Figure 3. The share of trips between each zone to all other zones is referred to as the trip distribution. For the 1996 base model trip distributions for the developed zones were determined through roadside interview surveys. For the purpose of modelling the different land-use scenarios, it was assumed that the trip distribution of already developed zones would remain the same and that only trip ends would change with an increase in trip generation. Trip distribution of as yet undeveloped zones, for which no surveyed data is available, were assumed to be similar to that of a combination of developed zones with approximately a similar land-use mix in its immediate vicinity.

5. RESULTS OF THE TRIP ASSIGNMENT

Trip assignment is the process that describes the route choice of the generated trips between the origin and destination zones according to the trip distribution. The model therefore simulates the traffic conditions on the road network (see Figure 2) to provide amongst others traffic volumes on individual road sections (including turning volumes at intersections), as well as the level of service achieved on road sections and at intersections given those traffic volumes. It should be appreciated that the SATURN model, for the different combinations of land-use scenarios and road network options, generates an immense amount of output. The analysis of this output is therefore the biggest constraint in presenting more detailed findings in the limited timeframe of this study. Further analysis of the output will result in far more detailed conclusions.

Selected output is presented in Tables 3 and 4 to demonstrate the impact of a combination of land use scenarios and network improvements on traffic volume.

6. CONCLUSIONS

The following conclusions can be reached from a cursory analysis of the available SATURN output, supplemented by previous experience in dealing with traffic conditions in the study area:

- a) Network improvements in the study area only will not be enough to accommodate growth in through traffic. The following external network improvements may be required to accommodate the expected increase in the growth in through traffic (see Figure 5):
 - extension and upgrading of Jip de Jager Avenue;
 - upgrading of Race Course Road/Tygerberg Valley Road to improve the link to the N7;
 - upgrading of Fairtrees/Eversdal Road; and
 - northwards extension of R300 Freeway.
- b) Upgrading of existing links within the study area, in particular the dualling of Charl Cronje Drive and Oald Oak Road and further upgrading of Durban/Willie van Schoor Roads will not be sufficient to accommodate additional ERV bulk rights. Additional links between the study area

Table 4: Traffic Flow on the Major Links in the Study Area: Future Through Traffic

	Scenario 1C		Scenario 2C		Scenario 3C		Scenario 4C	
	NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB
Carl Cronje								
Frans Conradie - Raglan	535	1096	962	1332	1815	2566	2615	2918
Raglan - Mispel	535	1371	832	1630	1535	2339	2037	2711
Mispel - Bill Bezuidenhout	676	2016	1177	2376	1680	3398	2032	3270
Bill Bezuidenhout - Tygerberg Valley	767	2110	718	3241	1096	4248	1241	4091
Tygerberg Valley - Van Riebeeckshof	978	2273	730	2796	716	3107	669	3064
Mispel								
West	210	715	352	753	347	1260	644	1208
East	783	626	1561	768	1082	813	1857	1244
Bloemhof	954	245	1058	214	1517	202	1395	212
Bill Bezuidenhout								
Carl Cronje - Durban	659	378	964	635	1100	714	996	792
Durban - Mountain View	397	1233	1181	1455	1483	1650	1478	1742
Tygerberg Valley								
Carl Cronje - Durban	932	979	1964	1016	2790	1150	2583	1255
Durban - Mountain View	1296	828	1633	1182	1812	1254	1758	1278
Door de Kraal	310	311	773	378	1048	431	1001	430
Durban/Willem van Schoor	1575	3298	2020	3759	2312	3966	2205	3974
Door de Kraal - Tygerberg Valley	1191	3396	2570	3913	3418	3989	3171	4091
Tygerberg Valley - Bill Bezuidenhout	1757	2333	2745	2831	3264	2752	2951	3427
Bill Bezuidenhout - Bloemhof	1940	2447	3024	2528	2929	2204	2672	2209
Bloemhof - Mispel	2681	3591	3952	3667	3259	3376	3557	3656

Table 3: Traffic Flow on the Major Links in the Study Area: Existing Through Traffic

	Scenario 1A		Scenario 2A		Scenario 3A		Scenario 4A	
	NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB
Carl Cronje								
Frans Conradie - Raglan	506	874	691	1116	1606	1817	2510	2044
Raglan - Mispel	506	935	715	1144	1452	1629	1938	1824
Mispel - Bill Bezuidenhout	610	1519	1060	1708	1613	2815	1792	2007
Bill Bezuidenhout - Tygerberg Valley	628	1570	645	2616	1002	3664	972	2838
Tygerberg Valley - Van Riebeeckshof	610	1569	643	2000	597	2526	1000	3149
Mispel								
West	126	605	462	681	382	1406	846	1175
East	731	530	1690	777	973	625	2018	1181
Bloemhof	815	174	905	189	817	179	1166	164
Bill Bezuidenhout								
Carl Cronje - Durban	593	343	925	631	1049	740	988	831
Durban - Mountain View	226	870	711	840	1059	1028	969	1345
Tygerberg Valley								
Carl Cronje - Durban	586	696	1663	599	2475	884	1941	1042
Durban - Mountain View	925	522	1323	1011	1698	1022	1438	1052
Door de Kraal	300	208	290	241	870	339	679	330
Durban/Willie van Schoor								
Door de Kraal - Tygerberg Valley	1275	2401	1336	2863	1703	2870	1422	2833
Tygerberg Valley - Bill Bezuidenhout	794	2438	2187	2961	2855	3107	2385	3283
Bill Bezuidenhout - Bloemhof	1319	1522	2427	2209	2689	2153	2405	2239
Bloemhof - Mispel	1415	1728	2622	1831	2727	1970	2463	1801
Mispel - N1	2117	2535	3571	2689	3109	2663	3240	2912

and the surrounding road network should also be considered. These additional links (see Figure 5) include:

- Carl Cronje Drive/N1 half diamond interchange; and
- Hendrik Verwoerd Drive between Jip de Jager Avenue and Carl Cronje Drive.

However, the relationship between Carl Cronje/N1 half diamond interchange and Hendrik Verwoerd Drive extension needs to be considered in terms of their respective cost/benefit ratios because these two links may be mutually exclusive rather than complimentary. The cost/benefit ratios will be influenced by:

- improved access to developments;
- impact on road user costs (VOC, time, accidents);
- environmental considerations;
- network considerations;
- technical constraints; and
- construction and maintenance cost.

- c) If additional bulk in the ERV and external traffic growth over 20 years are to be accommodated, it will require a major shift from private to public transport. Although such a traffic growth scenario does not pose an immediate threat to the viability of the corridor, efforts to stimulate the use of public transport should not be delayed, as experience has shown that modal shift is an extended process which can only be achieved over the medium to long term.

7. Recommendations

Based on the results and conclusions of the above analysis, the following recommendations are made:

- a) An implementation programme should be prepared to prioritise network improvements required in the Elsieskraal River Valley, as well as in the larger Tyger Valley area.
- b) A comprehensive technical, economic and environmental evaluation should be conducted to inform a decision on the implementation of the Carl Cronje/N1 half diamond interchange and the extension of Hendrik Verwoerd Drive.
- c) A public transport policy should be prepared, implemented and promoted as part of the long term transportation improvements in the larger Tyger Valley area.
- d) Detail traffic impact assessments should be prepared for each individual development which requires an increase in bulk, changes to land-use mix and/or changes to access arrangements. However, authorities and developers alike should take cognisance of the traffic impact at the macro level, as highlighted in this study, during the requesting/granting of additional development rights.