

5. CONCEPTUAL DEVELOPMENT FRAMEWORK

5.1 SPATIAL VISION

This section sets out the Vision for the SDF.

5.1.1 SPATIAL VISION AND CORE IDEAS

The Vision for the Municipality is as follows:

- ***"Wilderness tourism and transport gateway to the people, mountains and plains of the Central Karoo"***

The implications of this vision are as follows:

- Beaufort West town has a responsibility to present itself as a welcoming and convenient centre for catering for the needs of through travelers as well as to attract visitors to spend time in the sub-region;
- An important aspect of improving the presentation of the town is constructing the proposed bypass to remove heavy truck traffic from the main street. It is important to note the following:
 - The proposal should be implemented in a manner so that it does not detract from the economic activity that supports the town – namely fuel and refreshment purchases which are a result of private cars, buses, taxis and freight trucks stopping to refuel;
 - Cars, taxis and buses bypassing the town is not desirable and should be prevented; and,
 - It is envisaged that facilities for cars, taxis and buses not be permitted along the proposed freight route.
- Promoting urban tourism opportunities in the municipality's settlements will require upgrading their main streets, the creation and management of heritage precincts where appropriate and considerable effort into creating a town and township tourism culture based on B&Bs, restaurants and cultural activities such as the music for which the region has become well known (Karoo Kitaar Blues);
- Beaufort West should position itself as a tourist destination due to its expansiveness and desolation, particularly the areas north of the town in the Karoo National Park and the surrounding mountain regions;
- The main rural economic resource outside of eco-tourism is extensive agriculture. The growth of this resource depends on improving the carrying capacity of the land through good veld management practices;
- Wildlife preservation continues to be an issue in the Karoo. The preservation of biodiversity will require 'Fair Game' practices to be employed in sheep farming. 'Karoo Lamb' must become a trademark geographic indicator to increase its value and contribution to the economy;
- Accessibility and mobility issues, which are dire, can only be addressed if a Rural Integrated Public Transport Network is implemented, which provides periodic, affordable, reliable and safe services. Current costs of transport are affecting the poor;
- Intensive engagement should continue with the shale gas exploration open cast uranium mining proponents to successfully resolve the following issues to protect the long term interests of the municipality and its residents:
 - Maximizing job opportunities for locals and identify what skills training will be required so that they, and not outsiders, receive job benefits;
 - Ensuring that the nature and location of any infrastructure maximizes long term benefits – e.g. staff housing should be located in existing settlements;
 - Rehabilitation plans, including proper top soil stock piling, are prepared and implemented on a phased basis as extraction proceeds and not left until all extraction is completed. Mines should be prevented from starting further production phases until rehabilitation milestones of open cast pits or well head pads have been achieved;
 - Key areas such as CBAs, conservancies and stewardship areas and visually sensitive landscapes contributing to long term heritage and tourism opportunities should be off limits to mining and shale gas exploration;
 - As can be seen from Figures 5.1.1 (Wyoming) and 5.1.2 (New Mexico) the visual impact on the Karoo landscapes could be severe considerably diminishing their long term tourism appeal unless they are properly rehabilitated;
 - One of the potential impacts of shale gas exploration is the anthropogenic contamination of underground water aquifers;
 - It should be noted that both Beaufort West and Nelspoort are in a state of potential and, from time to time, actual crisis regarding their water supplies. These are increasingly dependent on groundwater as surface water sources have been inadequate for a number of years in spite of wide ranging water demand management efforts although there is not much evidence of rainwater harvesting, especially in new low income housing areas;
 - However, in recent years water demand has increased while recharge has decreased due in part to below average rainfall (<250mm p.a.) Beaufort West's boreholes have experienced a one metre per annum

drop in the water table; (Water Services Development Plan 2011/2012, p 28);

- Nelspoort is reliant on the Sout River aquifer whose recharge is considerably weakened by the highly degraded soil and vegetation conditions in the basin above. This is an important motivating factor for the biodiversity restoration of this bio-region;
- Beaufort West is exploring aquifers such as Rytkuil to the south of the town. However, this also underlies a potential open cast uranium mine;
- Clearly if the water supplies of these settlements is undermined or compromised their future will be in question; and,
- Short term impacts of shale gas extraction will include transport and traffic and issues around accommodating mining crews (roughnecks), physically (housing) and socially (employment, recreation, entertainment, schooling, health- HIV, alcohol, drugs; crime and prostitution).



Figure 5.1.1 Fracking in Pinedale, Wyoming (www.empowernetwork.com)



Figure 5.1.2 Fracking near Aztec Ruins and Mesa Verde, New Mexico
(Google Earth, 2009)

5.2 MACRO-CONCEPTUAL FRAMEWORK

5.2.1 NATURAL SYSTEMS SYNTHESIS, see Figure 5.2.1.1

Figure 5.2.1.1 indicates four distinct natural systems arising out of the synthesis of the natural systems found in the municipality. Issues identified include:

- Relatively dry with rainfall in the south approx. 100 – 200mm, Nuweveld mountains to the north approx. 200 – 300mm and highest rainfall in the east near Murraysburg in the Sneeu Berg mountains, 300 – 600mm;
- Geologically part of the Karoo Basin which has been identified as having shale gas potential. The entire municipality falls under either the Shell (north of Beaufort West) or Falcon O&G (south of Beaufort West) exploration areas, with the exception of an area that appears to exclude the Karoo National Park;
- Two large areas in the municipality under investigation for open cast uranium mining potential; around the R353 between Leeu Gamka and Fraserburg and just south of Beaufort West near the R61 to Aberdeen;
- Annual Horizontal Solar Radiation is fairly high – 2000 – 2100 KWh/m² increasing towards the north. Similarly wind speeds of 6 – 8m/s are also fairly high. Both these sources could be potential energy generators;
- The landscape comprises a backdrop of the Nuweveld Mountains fringing the northern border of the municipality at which Beaufort West is located at the southern tip and a large flat plain containing the Gamka and Sout River valleys. The topography around Murraysburg is distinctly different containing foothills rising to the Sneeu Berg range in the south;
- The rivers are almost all non-perennial and are generally classified as largely to moderately modified, i.e. their quality and quantity in relation to their original status is largely satisfactory. However, the rivers in the Sout River catchment are in a highly modified and poor state, in keeping with the generally highly degraded state of this area;
- Most of the vegetation falls under the Nama Karoo biome comprising Upper and Lower Karoo vegetation types with some Dry Highveld Grassland west of Beaufort West;
- Critical Biodiversity Areas (CBAs) comprise mainly the Upper and Lower Karoo vegetation types;
- The highly degraded Sout River basin comprises almost all this Grassland as well as large expanses Lower Karoo Vegetation.
- However, because there is so much of these vegetation types elsewhere, presumably because of their highly degraded state in this area and their prevalence elsewhere the Grassland areas are not considered CBAs nor Critically Endangered nor Endangered;
- In the instance of the highly degraded Sout River basin these classifications are considered problematic as they do not highlight the serious need for veld rehabilitation in this area which could become a dustbowl;
- The CBAs in the northern areas already enjoy significant protection with 88 000 ha (4% of municipality) in the Karoo National Park and 221 000 ha (10%) under private conservation;
- This contribution by the private sector to bio-diversity conservation goals can be considered a significant success of the stewardship and conservancy policies as it has saved considerable public resources;
- As well as a bio-diversity resource, extending the conservation of these CBAs will also contribute to increasing opportunities in the eco-tourism sector;
- Not surprisingly, in view of its geology and climate, agriculture comprises mainly extensive stock farming with some R50m p.a. derived from mainly from sheep and some cattle farming and R7m p.a. from crop farming, mainly maize; and,
- There is only approx. 6 500 ha of cultivated land of which only 1 000 ha is irrigated, mostly around Murraysburg.

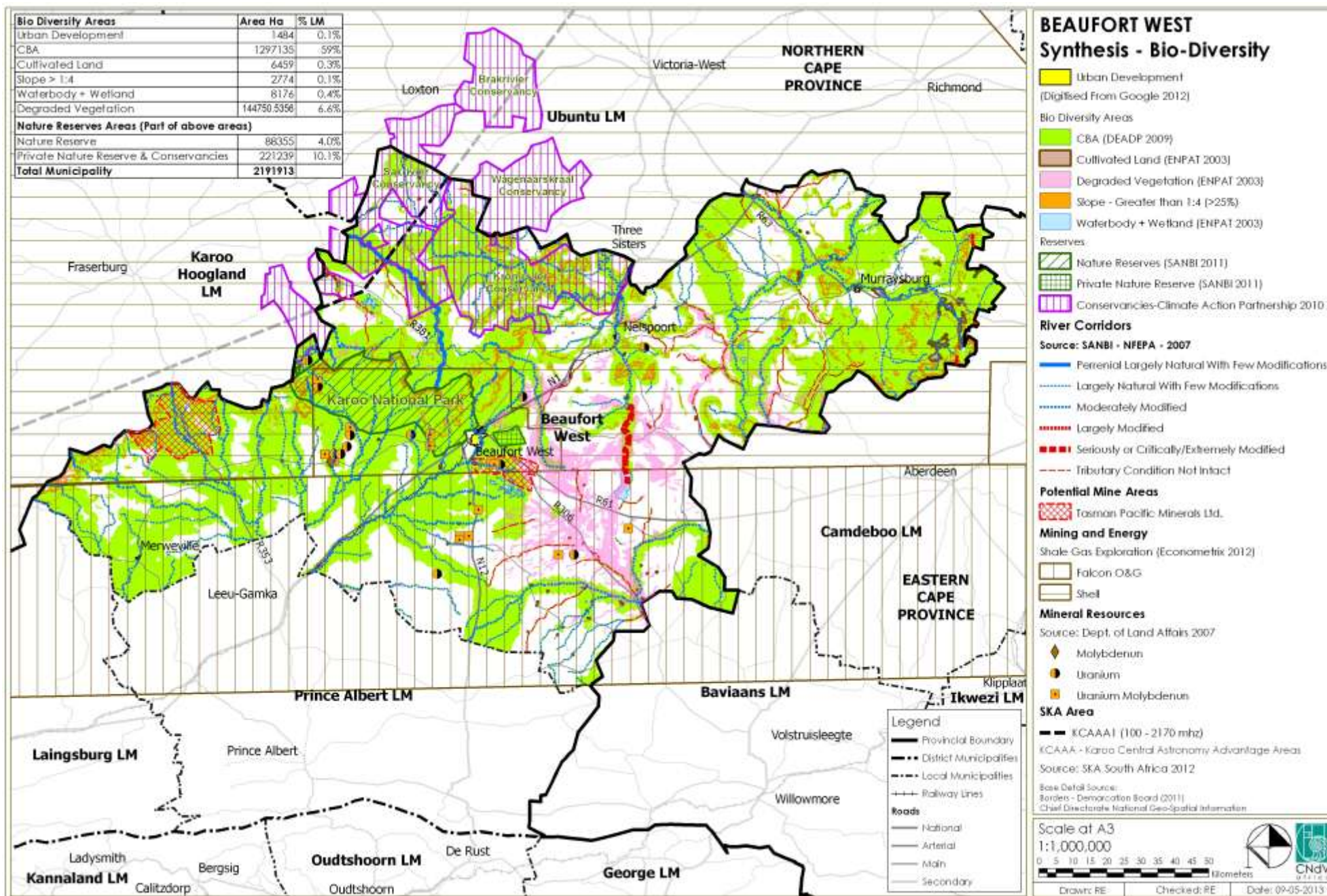


Figure 5.2.1.1 Beaufort West Municipality: Natural Systems Synthesis

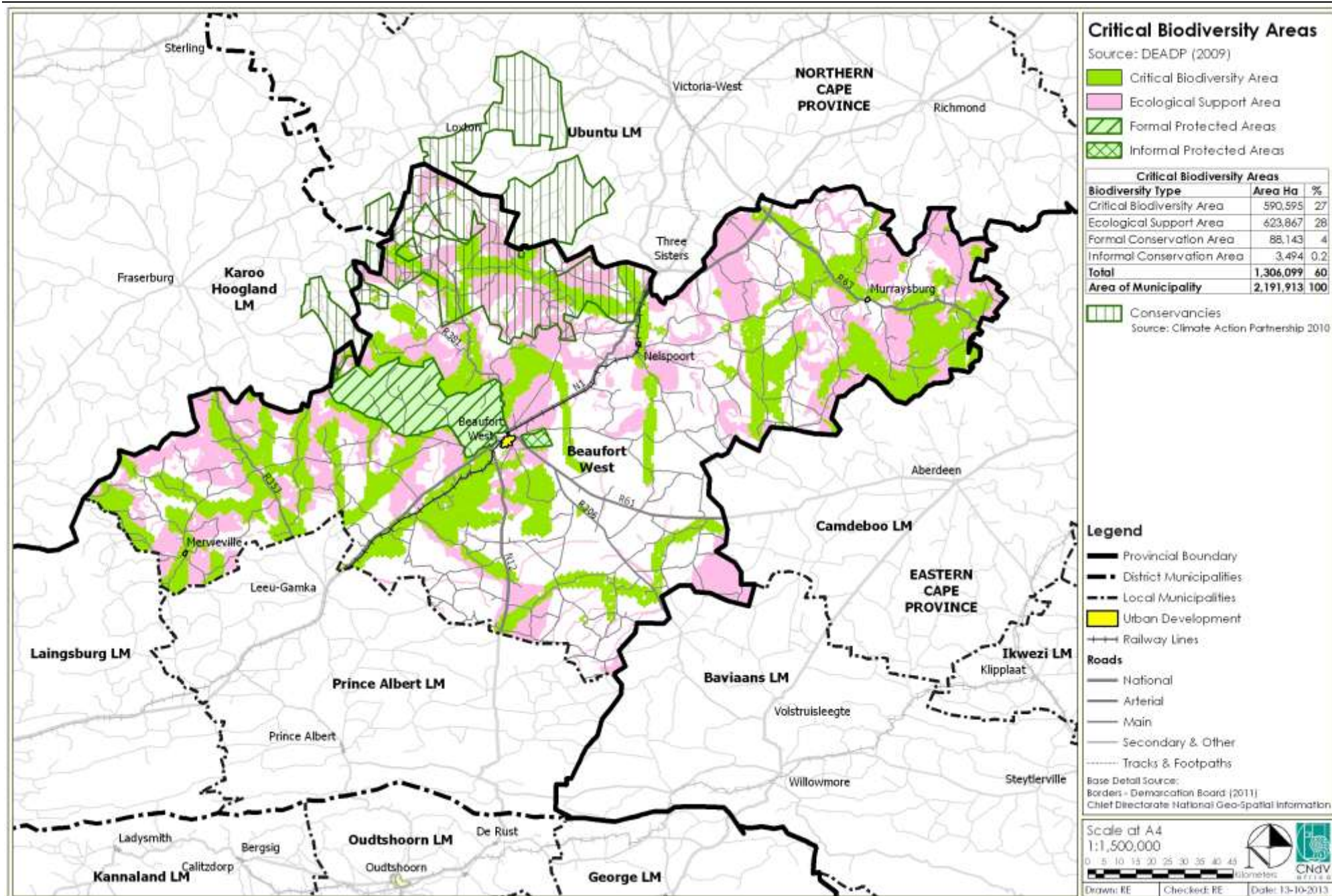


Figure 5.2.1.2 Critical Biodiversity Areas (DEA&DP, 2011)

5.2.2 SOCIO-ECONOMY AND BUILT ENVIRONMENT SYNTHESIS, see Figure 5.2.2.1

- The municipal population seems to have seen significant growth from 2001 ($\pm 43\ 000$) to 2011 ($\pm 50\ 000$);
- This 'growth' may largely be attributed to the inclusion of the DMA into Beaufort West Local Municipality in 2009/10, which includes Murraysburg and surrounding farms, and not necessarily natural or in-migratory growth;
- Agricultural employment appears to have declined from $\pm 1\ 400$ in 2001 to ± 700 in 2011. This decline is likely to result in migration from the rural areas to Beaufort West town;
- The share of population as per Census 2011 is thus:

- Rural areas	7 141
- Merweville	1 592
- Murraysburg	5 069
- Nelspoort	1 696
- Beaufort West	34 069
- Beaufort West town is by far the most important settlement in the municipality. It also plays a sub-regional role serving other small towns beyond its boundaries, particularly to the west, e.g. Victoria West, Fraserburg, and Loxton. People living in settlements to the east, e.g. Willowmore, Prince Albert, are more likely to use Oudtshoorn and George.
- It is also a major refueling and service stop on the N1 highway for trucks and is an important station on the national rail route between Cape Town and Gauteng;
- The activation and reinvigoration of the rail network is seen as central to reviving the economy and the vitality of the Karoo towns;
- The municipality is well served by hospitals with one in Beaufort West, Murraysburg and Nelspoort (district TB and psychiatric hospital);
- There are also clinic facilities in these centres as well as in Merweville and there is a rural clinic on the N12 towards De Rust;
- Beaufort West and Murraysburg have high schools and there are intermediate schools in Merweville and Nelspoort;
- The municipal employment structure is undergoing structural change mainly as a result of changes in its historical main economic resource, agriculture, and the rise in importance of Beaufort West town as a regional economic service centre.
- Agriculture, previously (2001 2nd highest employer has now slipped to 5th place, and manufacturing, financial services and households (domestic work) have overtaken it. Government services, already previously the most important employer, has increased even more;
- These employment changes have mainly occurred in Beaufort West and reflect its increasing importance as a wholesale and retail centre; two

shopping centres have been constructed and it serves as a tourism gateway to the sub-region and a government services centre;

- There is also increasing manufacturing employment, also largely reflecting the demand for repairs and maintenance of surrounding tourism enterprises and, most significantly, the N1 road and rail traffic;
- Although there are significant pockets of poverty particularly in Beaufort West Town and, to a much smaller extent in the other settlements, and unemployment levels remain high, (25.5%) they appear to have declined from an all time high of 39% in 2001;
- There are 14 land reform projects in the area. However, they are almost all situated in the degraded land to the south of the R61, an area identified in the previous section as requiring extensive rehabilitation of its rivers and bio-diversity. Overcoming this extreme degradation imposes an additional burden on emergent farmers;
- One area of potential opportunity is that both urban and rural properties are reasonably priced compared to other parts of South Africa although this does also reflect low demand;
- Beaufort West town and Murraysburg, to a lesser extent, have significant concentrations of potentially heritage worthy buildings which, if conserved and their surrounding precincts properly managed, can create the basis of a tourism industry based on this resource. There are also a number of historic homesteads in the municipality whose use for tourism purposes should be encouraged. Merweville also has a few heritage worthy buildings including the church and some residential dwellings. The older buildings in Nelspoort were built in the 1920s and there are a large number older than 60 years;
- Beaufort West town has a small airport which received scheduled air services from the 1940s to the 1960s at which point land based transport services improved to the extent that this level of service was no longer viable. However, the airport remains an important resource to serve both the business and tourism should these two sectors develop. The mining industry, particularly with regards to shale gas extraction, and uranium mining, if their various challenges regarding visual impact, bio-diversity rehabilitation, water resource protection and social impact can be resolved, may also become an important user of air travel; and,
- Major infrastructure passes through or near Beaufort West town including:
 - N1 highway between Gauteng and Cape Town, a major national freight route;
 - Cape Town – Gauteng freight and passenger rail link which has been losing traffic to road;
 - 132kv electricity power lines transmitting electricity from the north to the Cape; and,
 - Cape Town – Gauteng fibre optic cable currently under construction.

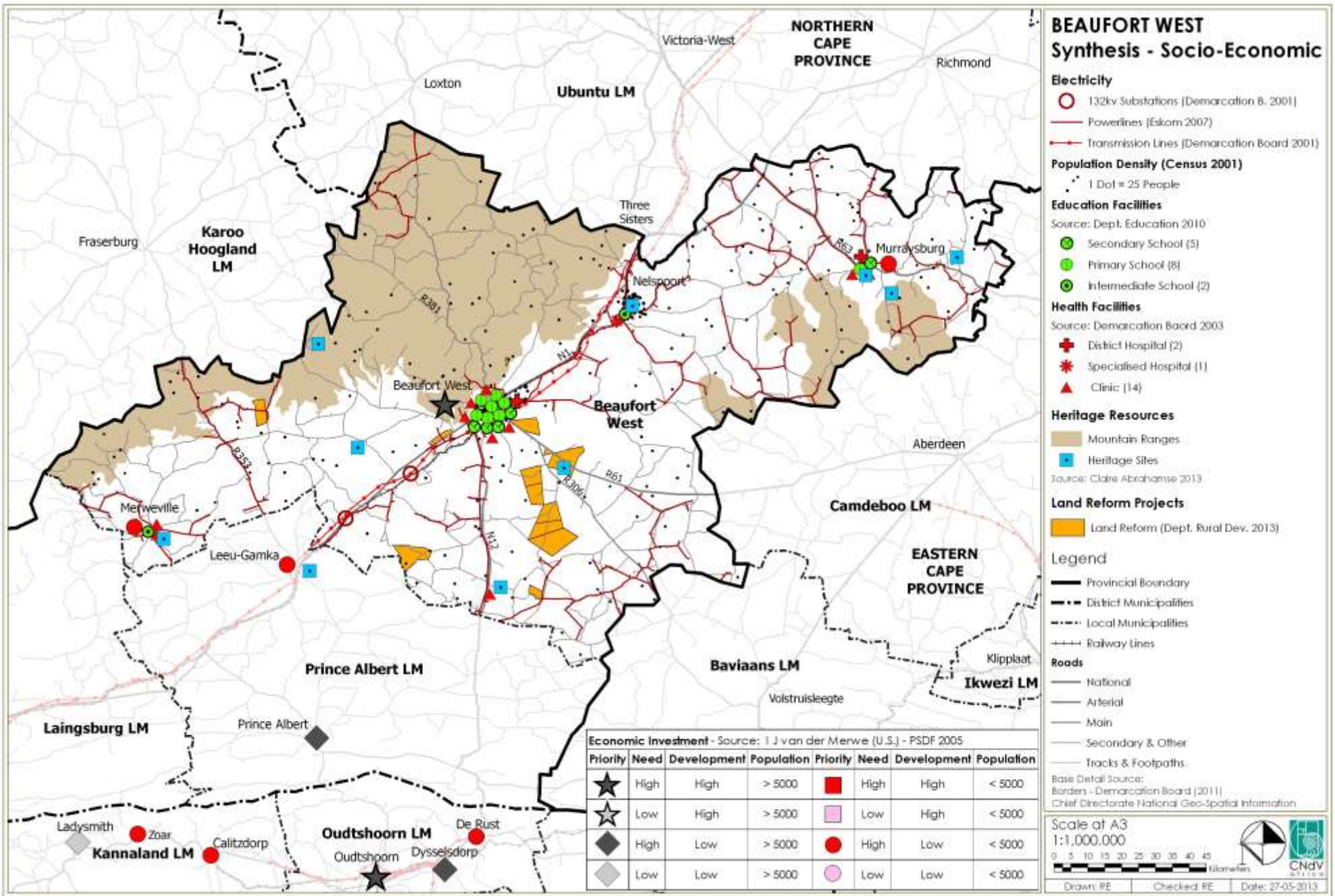
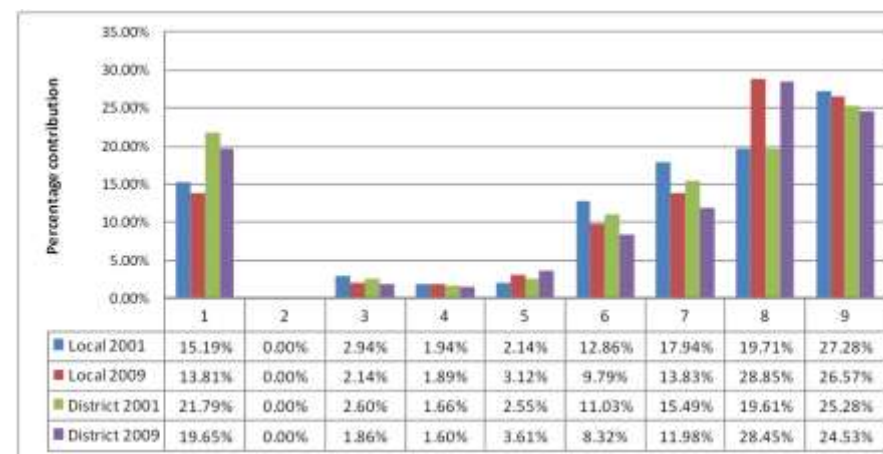


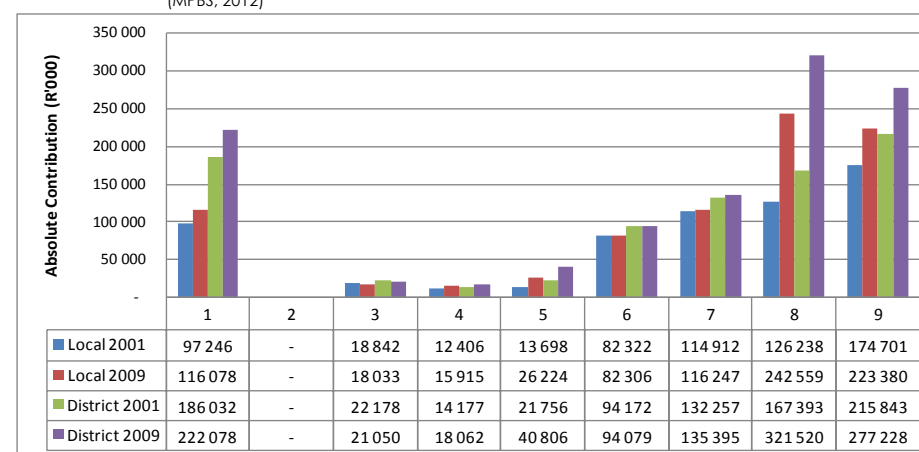
Figure 5.2.2.1 Beaufort West Municipality: Socio-economic Synthesis

5.2.3 SECTOR GVA CONTRIBUTIONS, Graph 5.2.3.1 and 5.2.3.2

- This information, taken from Western Cape Provincial Treasury data (2010) indicates a decline in most economic sectors with the exception of financial services;
- A slight increase is also indicated in construction but this is likely to be related to the boom of 2002 – 2007. As construction's demand is derived from activities in other sectors it is likely to have subsequently declined as well;
- It can be seen that there is no mining at present. However, this could change significantly in the time period of the SDF, namely 5 to 10 years, if current investigations into shale gas extraction and uranium mining prove successful. It will be important to keep a close watch on developments in this sector;
- There should be a focus on improving opportunities in the wholesale and retail, transport, storage and communication and financial services sectors. Mining may or may not provide a silver bullet to give significant impetus to the development of these sectors. This possibility should not distract from the need to continuously make improvements to existing operation in these sectors. for instance;
 - Enhancing eco, agri and heritage tourism opportunities by increasing the land under conservancies, creating well managed and maintained heritage precincts in the settlements that attract visitors and even permanent residents, and improving human resource skills to serve this industry;
 - Improving veld carrying capacity and therefore the numbers of stock that can be carried in the farming areas through veld management practices such as rotational grazing;
 - The possibility of attracting middle and upper income permanent residents either as retirees or as business entrepreneurs wanting to escape from the city should also be pursued. For instance Murraysburg's hospital, if properly staffed and managed and if the town was well maintained, could attract such residents wishing to retreat from the cities.
- Opportunities for improving urban quality should also be explored in Beaufort West town particularly along the main street. Building the long awaited freight route could create important opportunities in this regard.



Graph 5.2.3.1 Sector contributions to GVA for the local and district municipal areas in 2001 and 2009 (MPBS, 2012)



Graph 5.2.3.2 Sector contributions to GVA in Rand terms for the local and district municipal areas in 2001 and 2009 (MPBS, 2012)

Legend:

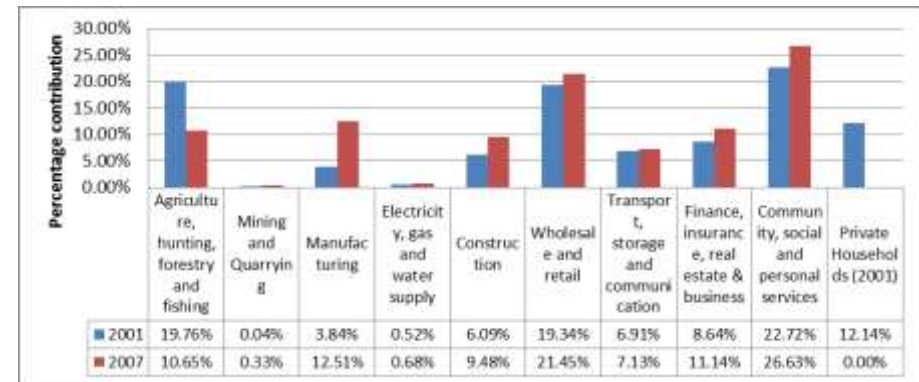
- 1 Agriculture, hunting, forestry and fishing
- 2 Mining and quarrying
- 3 Manufacturing
- 4 Electricity, gas and water supply
- 5 Construction
- 6 Wholesale and retail
- 7 Transport, storage and communication
- 8 Finance, insurance, real estate and business services
- 9 Community, social and personal services

Note: Mining and quarrying at the local level registered no activity in 2001 and 2009

Source: Adapted from Western Cape Provincial Treasury (2010)

5.2.4 SECTOR EMPLOYMENT CONTRIBUTIONS, Graph 5.2.4.1

- It is interesting to note there are more sectors where employment is increasing than GVA;
- While there is concern that this pattern suggests declining incomes, because the social cohesion of a municipality lies with the extent to which its population has access to economic opportunities and therefore employment, this pattern should generally be regarded as good news. This is because it would seem that there is a greater propensity to employment than GVA contribution in all sectors except agriculture;
- This is not to say that all is well and good as it is seen that unemployment is still around 25% although some of the negative impacts of this are likely to be alleviated by social grants;
- However, this also means that particularly Beaufort West town is likely to attract a significant amount of in-migration attracted by the greater **possibility** of finding work, not necessarily because there are actual jobs available. As this in-migration is likely to happen at a faster rate than the infrastructure of the town can develop informal settlements are likely to increase and grow;
- Notwithstanding this concern, the following areas of focus can be identified in which the municipality has significant advantages:
 - Manufacturing – repairs and maintenance to the agriculture, transport and tourism industries;
 - Construction – derived from growth in the other sectors;
 - Wholesale and retail – servicing mainly N1 road traffic and the needs of surrounding rural settlements and communities, particularly in the tourism industry;
 - Transport, storage and communication – taking advantage of Beaufort West town's strategic location on national road and rail transport, fibre optics and electricity transmission line routes;
 - Finance, insurance and real estate – as the secondary sectors grow and become more sophisticated they will require increasing support from this sector;
 - This sector also contains much of the tourism industry which has significant resources in the municipality which can be increased over time;
 - Community services – due to Beaufort West town's central location on the N1 and in the region, demand for these services is likely to grow over time.



Graph 5.2.4.1 Sector contribution to Employment (MPBS, 2012)

5.2.5 BROAD SPATIAL CONCEPT

Figure 5.2.5.1 shows the broad Conceptual Spatial Development Framework for the Municipality.

There are five main structuring elements:

- The N1 road and adjacent rail route is the main transport and socio-economic artery through the municipality, significantly increasing its opportunities compared to other similar sized municipalities not enjoying such access.
- The Nuweveld Mountains to the north form an impressive scenic backdrop to the municipality. They contain large areas of significant CBAs and most of the formal and informal conservation areas – 14% of the total area are found here;
- The Gamka river basin contains the settlements of Beaufort West town and Merweville and is mostly used for extensive farming – small stock grazing;
- South of Beaufort West is a large area of significantly degraded land in the Sout River basin with extremely low stock carrying capacity and low concentrations of people. It can be clearly seen on Figure 5.3.1.2. This area requires extensive rehabilitation if it is not to become a dustbowl;
- To the west Murraysburg forms an almost separate eco and social system. It is not directly linked to Beaufort West but is accessed off the R63 between Graaff Reinet and Victoria West. It is the highest, wettest and most fertile part of the municipality where most of the small areas of intensive farming are found, particularly in the west. In the south the landscape rises up to the Sneeuberg. It is 91kms from Graaff Reinet in the Eastern Cape and 158kms from Beaufort West. This remote location creates a significant challenge as it depends on services delivered from Beaufort West.

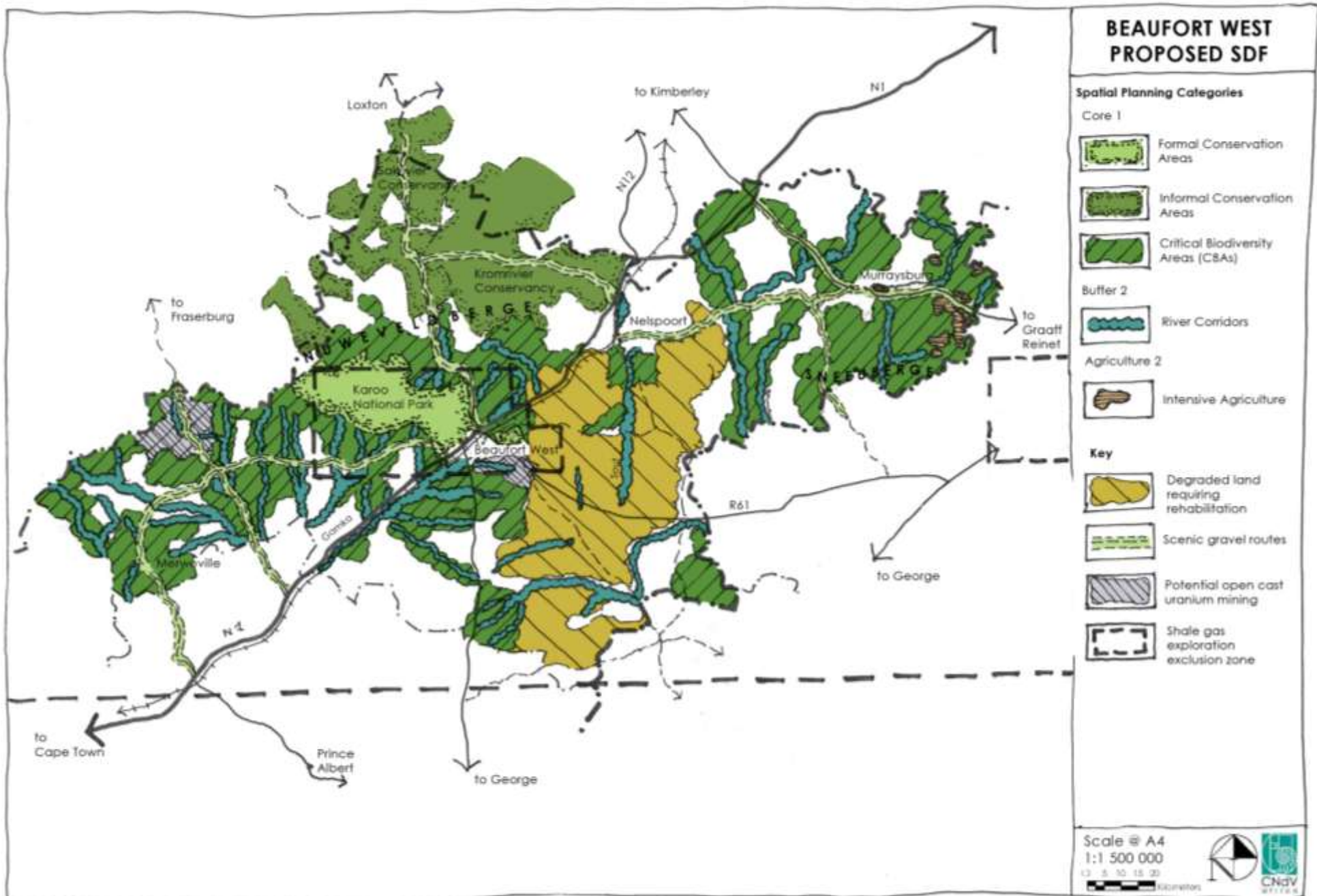


Figure 5.2.5.1 Beaufort West Municipality: Broad SDF Concept

5.3 MUNICIPAL SPATIAL DEVELOPMENT FRAMEWORK

The spatial development framework for the municipality comprises the following elements:

- Bio-regions;
- Spatial Planning Categories (SPCs);
- Sustaining the Economy
- Major Infrastructure Projects;
- Major Tourism Destinations;
- Land Reform;
- Urban Related Development;
- Urban Design Guidelines;
- Potential Rural Nodes and Periodic Rural Markets; and,
- Settlement Hierarchy;

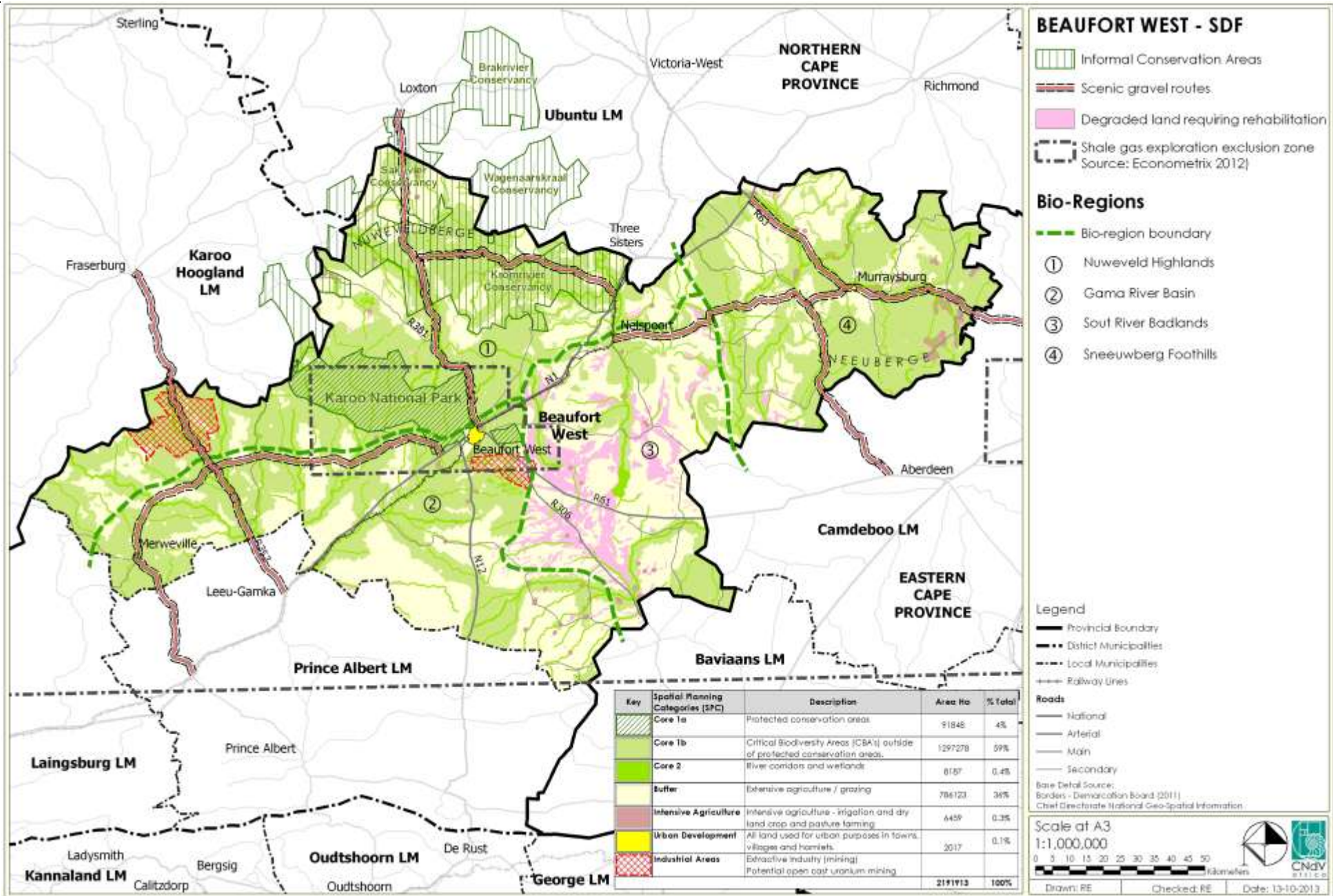


Figure 5.3.1 Beaufort West Municipality: Spatial Development Framework

5.3.1 BIO-REGIONS

Section 5.2.1 identified four bio-regions that can be distinguished in terms of the natural environment and economy as shown in Table 5.3.1.1. They are shown on Figure 5.3.1.1.

The bio- regions are:

- Nuweveld Highlands;
- Gamka River Basin;
- Sout River Badlands; and,
- Sneeuwberg Foothills.

Table 5.3.1.1 shows the characteristics of the four bio-regions.

General: Investigate the removal of conservancies and stewardship areas as well as formally protected land like National Parks from the shale gas exploration areas.

5.3.1.1 Nuweveld Highlands

- NH1 Promote this area as a bio-diversity and eco-tourism sub-region and encourage the extension of the Karoo National Park and the existing conservancies including accommodation opportunities focusing on Critical Biodiversity Areas (CBAs);**
- NH2 In extensive farming areas outside of formal and informal conservation areas and including CBAs improve the overall bio-diversity through good veld management practices and rotational grazing methods such as Acocks or Savoury;**
- NH3 Focus on the rehabilitation of river corridors as the first step in this process;**
- NH4 Encourage use of rural roads as scenic self-drive and MTB routes; and,**
- NH5 Ensure proper mine rehabilitation plans including top soil stockpiling are in place before mining commences and that mines are prevented from future phases of mining until agreed rehabilitation milestones are achieved.**

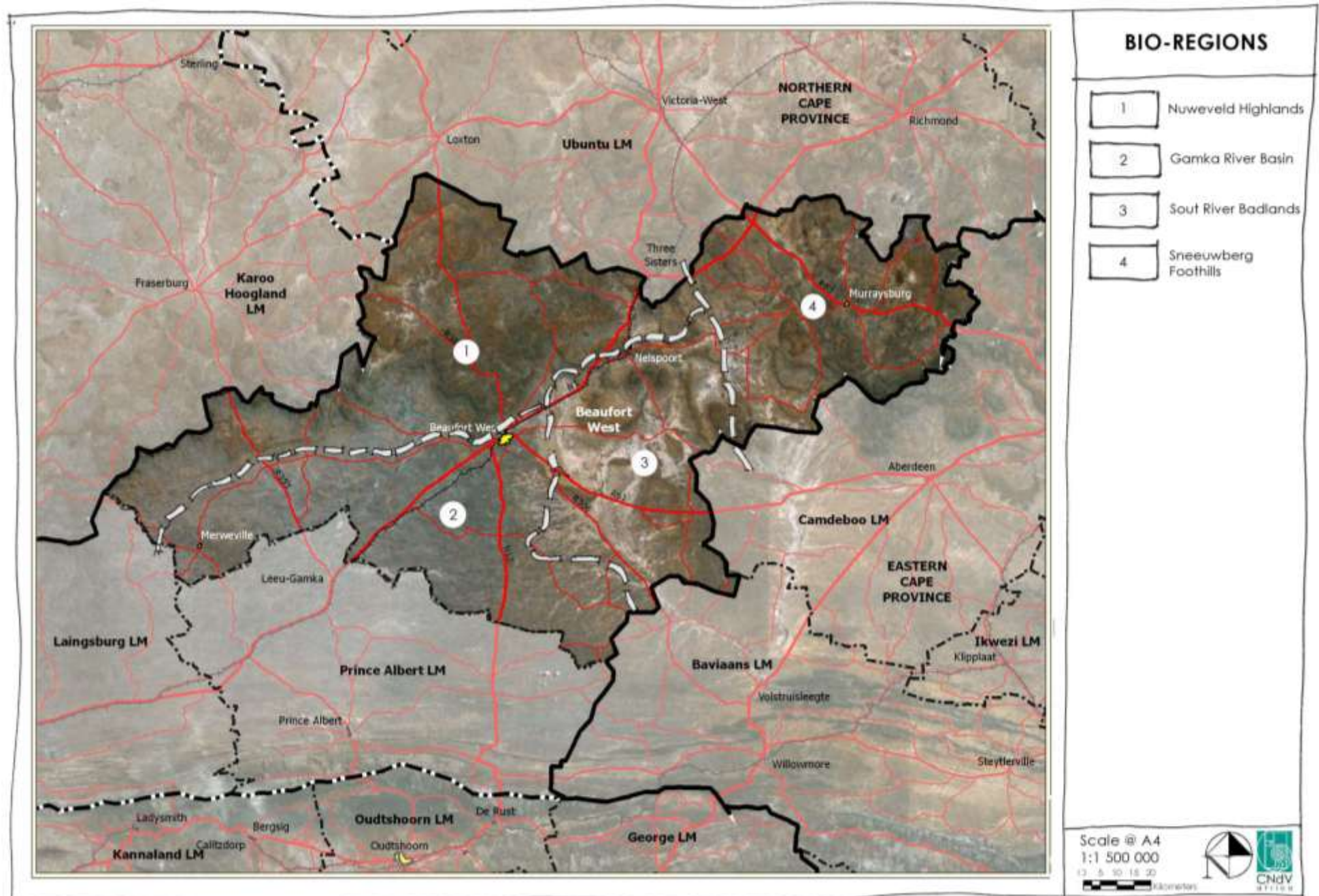


Figure 5.3.1.1 Beaufort West Bio-regions

5.3.1.2 Gamka River Basin

GR1 Promote bio-diversity conservation of CBAs and river corridors well as land to be retained for extensive agriculture through the creation of conservancies and good veld management practices and rotational grazing methods such as Acocks or Savoury.

5.3.1.3 Sout River “Badlands”

SRB1 Implement extensive veld rehabilitation programs to restore the Nama Karoo and Dry Karoo Grasslands and water courses as a matter of urgency.

5.3.1.3 Sneeuwberg Foothills

SF1 Protect all potential and existing arable land (intensive agriculture) as the most important economic rural land from other uses;

SF2 Promote bio-diversity conservation of CBAs and river corridors well as land to be retained for extensive agriculture through the creation of conservancies and good veld management practices and rotational grazing methods such as Acocks or Savoury;

SF3 Encourage use of rural roads as scenic self-drive and MTB routes.

	Nuweveld Highlands	Gamka River Basin	Sout River Badlands	Sneeuwberg Foothills
Altitude (m)	1250-1750	750 - 1250	750 – 1250	1250 - 2000
Population distribution	Very few rural - few – isolated farmsteads and conservation areas	Beaufort W. 34 000 Merweville 1500	Nelspoort 1600	Murraysburg 5000 Rural areas – ± 7 000
Agriculture	Stock farming	Stock farming – better quality veld	Stock farming – low carrying capacity	Mainly extensive, some dryland crops– 5 000 ha Irrigation 1000 ha
Mining	Potential open cast uranium mine on R353 Shale gas exploration except Karoo National Park	Potential open cast uranium mine on R61 Shale gas exploration	Shale gas exploration	Shale gas exploration
Bio-diversity	Extensive CBAs Nama Karoo	Some CBAs Nama Karoo	Excessive degradation Nama Karoo and Dry Karoo Grassland	Extensive CBAs Nama Karoo
Tertiary	Eco and agri-tourism - hunting	Eco and agri – tourism – hunting, Transport, Wholesale, retail and services – Beaufort West town	Possibly some eco-tourism - hunting	Eco and agri-tourism - hunting
Renewable energy potential	Fairly good solar Fairly good wind	Fairly good solar Fairly good wind	Fairly good solar Fairly good wind	Fairly good solar Fairly good wind
Hydrology	Source of numerous non-perennial in relatively undisturbed state	Gamka river basin with rivers in relatively undisturbed to disturbed state	Sout River in extremely disturbed state needing significant rehabilitation including many other non-perennial rivers in bio-region	Numerous perennial and non-perennial rivers in good condition
Landscape character	Classical steep mountain ranges forming impressive backdrop to whole municipality westwards from N1	Flat cosmic plains flowing to the south framed by Nuweberg to the north	Flat desert-like cosmic plain inclining to the south	Romantic landscape of rolling hills rising to the Sneeuwberg in south

Table 5.3.1.1 Sub-regions and characteristics

5.3.2 SPATIAL PLANNING CATEGORIES FOR LAND USE MANAGEMENT

The Spatial Planning Categories provide the basis for managing rural land uses. The general conditions guiding what activities may occur within each category are generally in accordance with those set out in Table 5.3.2.1.







	SPC	Description	Policies	Notes	Responsibility
	Core 1a	Formally protected conservation areas	Formally protected areas, including those under SANParks and CapeNature control, should continue to enjoy the highest levels of protection. Further continuous corridors between the mountain and the sea should be promoted. The municipality should engage with the conservation authorities to ensure that economic growth and employment opportunities from these areas are maximized.		Municipality SANParks CapeNature Tourism organisations
	Core 1b	Critical Biodiversity Areas (CBAs) outside of formally protected conservation areas	Conservation of endangered vegetation areas shall be encouraged through the promotion of conservancies and stewardship projects with limited eco-tourism development rights and/or donations to formal conservation agencies. All CBAs should be ground-truthed before they are finalized. Conservation of CBAs should be incentivized through the granting of limited development rights as per the rural Land Use Planning and Management Guidelines for Holiday Accommodation, low density rural housing, low impact tourist and recreational facilities (CapeNature 2010).		Municipality CapeNature Dept of Tourism SANBI
	Core 2	River corridors and wetlands (Ecological Support Areas)	River corridors and wetlands, including ephemeral pans, must be protected from urban, agricultural and mining activities to a distance of at least 32 metres from their banks unless closer setback lines have been determined by a geohydrologist and freshwater ecologist.		Municipality, DWAF, Dept of Agriculture, SANBI
	Buffer	Extensive agriculture / grazing	Rotational grazing and other veld management best practices shall be promoted livestock grazing so as to improve biodiversity and stocking rates		Municipality Dept of Agric
	Intensive Agriculture	Irrigation and dry land crop and pasture farming	All existing and potential land suitable for intensive agriculture shall be protected from conversion to other uses including conservation. Agriculture water demand management must be practiced and intensive agriculture water supplies shall be protected and not diverted to other uses. Investigate methods to bring the agricultural land currently lying fallow back into production if possible.		Municipality Dept of Agric Consultant
	Urban Settlement	All land used for urban purposes in towns, villages and hamlets.	Urban development shall be promoted within urban settlements according to the settlement planning principles, see Section 5.4.		Municipality
	Urban Edge	Outer boundary of urban settlement aligned to protect natural and agricultural resources and to promote more compact settlements	No urban development shall be permitted outside of Urban Edges.		Municipality Dept of Agric

Table 5.3.2.1 Spatial Planning Categories

5.3.3 SUSTAINING THE ECONOMY

- Beaufort West town's strategic location on the N1 means that it is central to a number of strategies to sustain the economy. They include:
 - Servicing road and rail transport, mainly freight and some passenger along the N1** - This is likely to increase as international trade increases after the recession ends and local eco- agricultural (farm stay) and heritage tourism markets increase;
 - Presenting itself as the tourism gateway to the Central Karoo** - It already occupies a strategic position at the intersection of a number of sub-regional routes from surrounding towns;
 - It is also well placed to service these sub-regional tourism operations as well as self-drive and coach visitors to the SKA as this develops over the next decade;
 - However, it will be important that Beaufort West town significantly improves its appearance and deals with grime and petty crime issues;
 - Building a freight route and proclaiming and managing the centre of town as a heritage area** – These will be key local strategies to unlock this potential;
- Improving agricultural carrying capacity throughout the municipality using rotational grazing and other strategies will be key to maintaining and increasing GVA and employment as well as upstream agri-industries;
- Implementing these strategies will create a virtuous overlap with achieving bio-diversity conservation goals as improving veld carrying capacity means increasing climax vegetation species;
- An important focus of improved veld management will be addressing the rehabilitation of the Sout River "Badlands" in order to prevent this area turning into a dustbowl with negative agricultural and bio-diversity consequences;
- Maintaining and enhancing the bio-diversity of the river corridors is seen as a key first action in this process. This can be achieved by declaring river set back lines of at least 32 m in which alien vegetation should be eradicated, there should be no ploughing or urban development and where practicable stock grazing should be prevented so as to allow indigenous riparian vegetation to recover and erosion of water courses to be slowed and managed; and,
- The intensification of development along the identified activity routes per settlement can assist with economic stimulation at the local level.

5.3.4 MAJOR INFRASTRUCTURE PROJECTS

The following projects should be considered:

- Implement a multi-pronged water management strategy:
 - Rainwater harvesting
 - Grey water recycling
 - Reducing unaccounted for water
 - Extension of regional water service delivery
 - Water demand management for large users.
- Promote domestic and large wind and solar energy projects subject to appropriate guidelines and siting principles.

Figure 5.3.4.1 shows the infrastructure projects per town as listed in the IDP.

The following major projects are included in the budget:

- Provision of a new administration office in Beaufort West (R200m);
- Provision of a new 132kV substations (R12m);
- The upgrading of the 11kV switchgears at Mandlenkhosi, Rustdene and Beaufort West (R50m);
- The upgrading of the WWTWs for Nelspoort, Beaufort West, Murraysburg and Nelspoort (R15,5m);
- New Community halls at Prince Valley and Merweville (R20m);
- New One-Stop-Youth Centre at Kwa-Mandlenkhosi (R15m);
- Upgrading of sport field and courts at Rustdene, Voortrekker Street, Kwa-Mandlenkhosi, Merweville and Nelspoort (R13,85m);
- New housing developments (R143m)

Table 5.3.4.1 below sets out the various IDP Infrastructure Projects.

Water and Sewerage Distribution				
No	Town	Project	Cost	Funding Source
1	Municipal	Pressure release valves	600 000	MIG
		Pressure release valves	1 400 000	MIG
		New Water Reservoir	1 000 000	RBIG
	Sub-Total		3 000 000	-
2	Beaufort-West	Upgrading existing WWTW – Beaufort West	8 000 000	MIG
		Upgrading existing WWTW – Beaufort West	5 000 000	MIG
		New prepaid water meters Phase 1 – Prince Valley	1 000 000	MIG
		Realign bulk water – Rustdene	636 690	MIG
		New Sewerage Pipeline next to Buitekant Street	500 000	MIG
	Sub-Total		15 136 690	-
3	Murraysburg	Investigation of Murraysburg WWTW	500 000	MIG
		Upgrading of Murraysburg WWTW	6 000 000	MIG

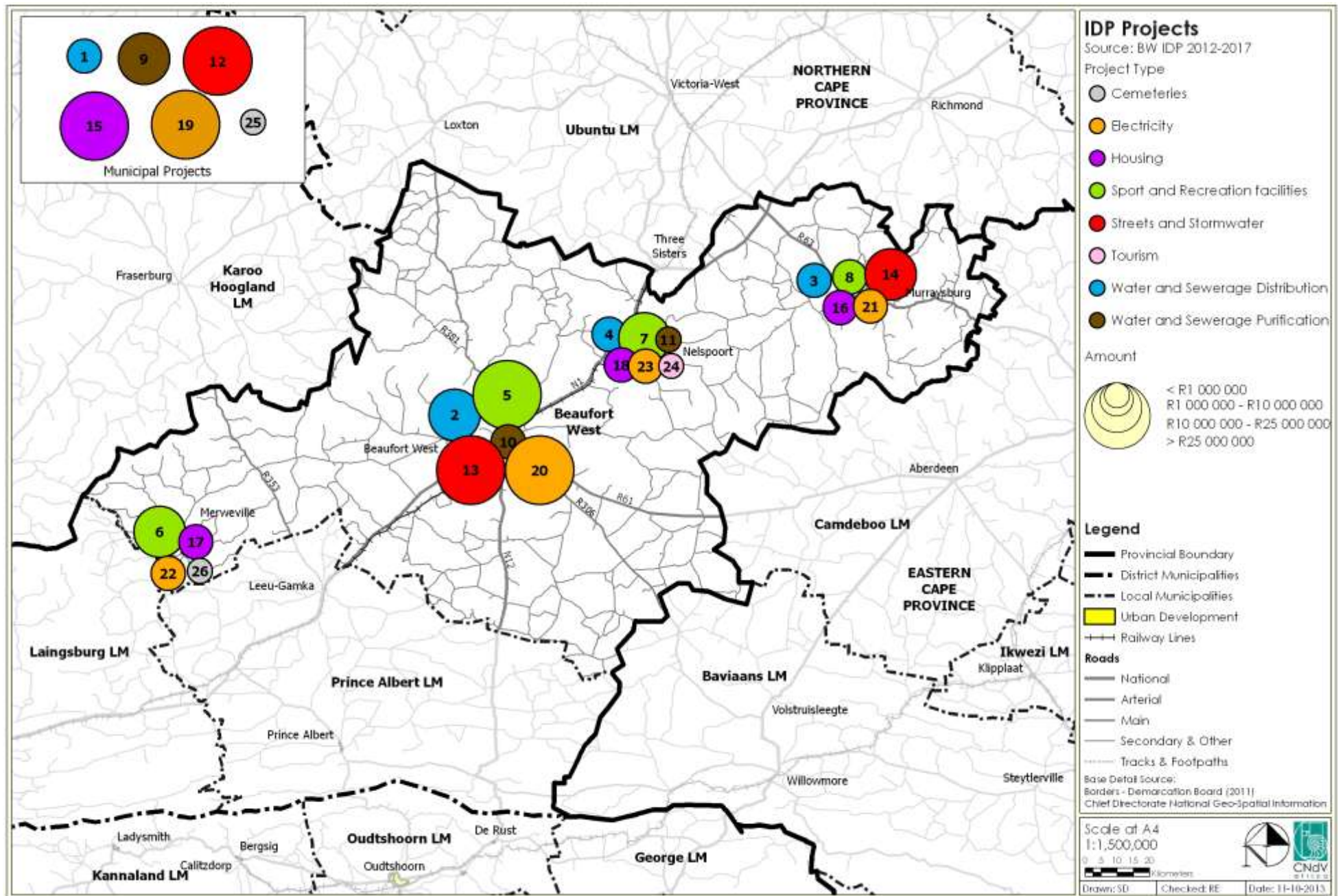


Figure 5.3.4.1 Major Infrastructure Projects

Water and Sewerage Distribution				
No	Town	Project	Cost	Funding Source
		Upgrade Water Supply – Murraysburg	1 400 000	MIG
	Sub-Total		7 900 000	-
4	Nelspoort	Bulk water supply – Nelspoort	2 602 038	MIG
		Upgrading of Nelspoort WWTW	2 000 000	MIG
		Bulk Water supply – Nelspoort	1 314 512	MIG
	Sub-Total		5 916 550	-
	TOTAL		31 953 240	-
Sports and Recreation Facilities				
No	Town	Project	Cost	Funding Source
5	Beaufort-West	Upgrading of Rustdene sport facilities	350 000	MIG
		Upgrading Rustdene sport field	1 000 000	MIG
		Upgrading of Voortrekker Street tennis courts	500 000	MIG
		Upgrading of Kwa-Mandlenkosi sport field	3 000 000	MIG
		Upgrading town rugby field	3 000 000	MIG
		Kwa-Mandlenkosi – neighbourhood development	5 500 000	MIG
		Prince Valley: Community Hall	10 000 000	Unfunded
		Hillside II: Community Hall	10 000 000	Unfunded
		One administration office B/West	200 000 000	Unfunded
		One Stop Youth Centre: Kwa-Mandlenkosi	15 000 000	Unfunded
		Maintenance of buildings and community facilities	19 000 000	Unfunded
	Sub-Total		267 350 000	-
6	Merweville	Upgrading of Merweville sport field	3 000 000	MIG
		Merweville: Community Hall	10 000 000	Unfunded
		Maintenance of buildings and community facilities	6 000 000	Unfunded
	Sub-Total		19 000 000	Unfunded
7	Nelspoort	Upgrading Nelspoort sport field	3 000 000	MIG
		Maintenance of buildings and community facilities	8 000 000	Unfunded
	Sub-Total		3 000 000	-
8	Murraysburg	Maintenance of buildings and community facilities	7 000 000	Unfunded
	Sub-Total		7 000 000	-
	TOTAL		296 350 000	-
Water and Sewerage Purification				
No	Town	Project	Cost	Funding Source
9	Municipal	Development of Aquifers	5 000 000	Unfunded
		Development of Aquifers	5 000 000	Unfunded
		Upgrading of existing pump stations	4 500 000	Unfunded
		Upgrade a water network: all towns	2 000 000	Unfunded
	Sub-Total		16 500 000	-
10	Beaufort-West	Installation of Archimedean Screw Pump	500 000	Unfunded
		Upgrading of existing chlorination room	100 000	Unfunded
		Upgrading of existing Telemetry System	400 000	Unfunded
		Upgrade of fencing at Beaufort West WWTW	250 000	Unfunded
		Repair of existing Aeration Basin	350 000	Unfunded
	Sub-Total		1 600 000	-
11	Nelspoort	Investigation of Nelspoort WWTW, capacity	100 000	Unfunded
	Sub-Total		100 000	-
	TOTAL		18 200 000	-

Roads and Storm Water				
No	Town	Project	Cost	Funding Source
12	Municipal	Retention dam	9 160 000	MIG
		Retention dam	5 000 000	MIG
		Gravel roads	9 000 000	MIG
		Gravel roads	9 000 000	MIG
		Storm Water N1	5 000 000	
		Rehabilitate gravel roads – Phase II	1 258 509	MIG
	Sub-Total		38 418 509	-
13	Beaufort-West	Roads Kwa-Mandlenkosi	843 396	MIG
		Rehabilitate gravel roads Kwa-Mandlenkosi	2 494 916	MIG
		Storm water retention dam – Hillside II	4 426 294	MIG
		New storm water channel – Hillside II	77 265	MIG
		Rehabilitate gravel roads - Rustdene	360 000	MIG
		Rehabilitate gravel roads – Hillside II	6 176 482	MIG
		Upgrade gravel roads – Beaufort West	2 463 406	MIG
		Rehabilitate gravel roads – Beaufort West	9 000 000	MIG
	Sub-Total		25 841 759	-
14	Murraysburg	Rehab roads and storm water–Murraysburg	3 400 000	MIG
		Rehabilitate gravel roads – Murraysburg	6 170 195	MIG
		Storm water – Murraysburg	1 620 000	MIG
		Upgrade gravel roads – Murraysburg	3 972 545	MIG
	Sub-Total		15 162 740	-
	TOTAL		79 423 008	-
Housing				
No	Town	Project	Cost	Funding Source
15	Municipal	Consolidation project: 95 units Kwa-Mandlenkosi	7 403 170	DoHS
		Emergency housing: Upgrade 10 houses damaged by fire or other natural causes	750 000	DoHS
		Greening Project	3 500 000	DEA
		Material Recovery Facility (Waste Recycling)	800 000	MIG
		XHOXHA – 65 units	6 500 000	Unfunded
		Planned: New Housing Development	40 000 000	Unfunded
		GAP Housing +/- 200 Units	90 000 000	Unfunded
	Sub-Total		148 953 170	-
16	Murraysburg	RDP Housing 100 units	6 800 000	Unfunded
	Sub-Total		6 800 000	-
17	Merweville	RDP Housing 50 units	3 400 000	Unfunded
	Sub-Total		3 400 000	-
18	Nelspoort	RDP Housing 50 units	3 400 000	Unfunded
	Sub-Total		3 400 000	-
	TOTAL		162 553 170	-
Electricity				
No	Town	Project	Cost	Funding Source
19	Municipal	132kV Substation	8 000 000	DoE
		132kV Substation	1 400 000	DoE
		Electrification Central Karoo	12 000 000	DoE
		132kV Substation	12 000 000	DoE
		Housing electrification 367 erven	3 000 000	DoE
		Housing electrification 367 houses	1 500 000	DoE
		Upgrading main substation 22/11kV	5 000 000	Unfunded

		Load control 132/22kV Substation	5 000 000	Unfunded
		11kV Network new Industrial area	2 000 000	Unfunded
		Auto Recloser 11kV Plotte	250 000	Unfunded
		Isolator and Switchgear 22kV lines	250 000	Unfunded
		Telemetrie 11kV Substations	1 000 000	Unfunded
	Sub-Total		51 400 000	-
20	Beaufort-West	High mast lighting Hooyvlakte	501 600	MIG
		Upgrading 11kV Switchgear Beaufort West	15 000 000	Unfunded
		Upgrading 11kV Switchgear Rustdene	30 000 000	Unfunded
		Upgrading 11kV Switchgear Kwa-Mandlenkosi	5 000 000	Unfunded
		Upgrading overhead lines Rustdene	1 000 000	Unfunded
		Upgrading overhead lines Hillside	3 000 000	Unfunded
		Upgrading overhead lines Beaufort West	1 000 000	Unfunded
		Upgrading mini substation Bastiaanse school	650 000	Unfunded
		Upgrading mini substation Botha Street	650 000	Unfunded
		Upgrading transformer Truter substation	350 000	Unfunded
		Flood lighting sport ground Rustdene	1 200 000	Unfunded
		Flood lighting sport ground Rugby field	1 200 000	Unfunded
		High mast lighting Rustdene	1 381 862	MIG
		High mast lighting Hillside I	552 745	MIG
		High mast lighting Hillside II	276 372	MIG
	Sub-Total		61 762 579	-
21	Murraysburg	High mast lighting Murraysburg	552 745	MIG
		Upgrading electrical network Murraysburg	700 000	Unfunded
	Sub-Total		1 252 745	-
22	Merweville	High mast lighting Merweville	829 117	MIG
		Flood lighting sport ground Merweville	1 200 000	Unfunded
		High mast lighting Merweville	250 800	Unfunded
	Sub-Total		2 279 917	-
23	Nelspoort	Flood lighting sport ground Nelspoort	1 200 000	Unfunded
		Sub-Total	1 200 000	-
	TOTAL		66 495 241	-
Tourism				
No	Town	Project	Cost	
24	Nelspoort	Nelspoort Rock Art Site Development	289 000	CKDM
		Sub-Total	289 000	Unfunded
	TOTAL		289 000	-
Cemeteries				
No	Town	Project	Cost	Funding Source
25	Municipal	Upgrading of Cemeteries – Municipal wide	500 000	Unfunded
		Sub-Total	500 000	-
26	Merweville	Upgrading of Merweville morgue	250 000	Unfunded
		Sub-Total	250 000	-
	TOTAL		750 000	-
	GRAND TOTAL		656 013 659	-

Table 5.3.4.1 IDP Budget 2012-2017 (source: IDP 2012-2017)

5.3.4.1 Tree Planting and Paving

Tree planting is one of the cheapest forms of urban upgrading with the greatest positive visual impact.

If this is coupled with the paving of one or two strategic squares and streets, the overall impression of a settlement can be considerably improved. This will improve its chances of attracting visitors and investment.

These projects can form part of an Extended Public Works Program (EPWP). They are labour intensive and cost effective. For example, broken bricks can be used for paving or pavers can be made on site. Suitable shady tree species include:

- Celtis sinensis - deciduous – exotic
- Ceratonia siliqua - evergreen – exotic
- Celtis Africana
- Combretum erythrophyllum



Celtis sinensis



Celtis Africana



Combretum erythrophyllum



Ceratonia siliqua



Public road works in Vredendal North

5.3.5 MAJOR TOURISM DESTINATIONS

The following main tourism destinations with major related attractions are identified, see Figure 5.3.5.1:

- Karoo National Park and existing and future Nuweberg conservancies open to the public;
- Pre-colonial rock art near Nelspoort to be protected;
- Urban heritage precincts in the main settlements and associated overnight and refreshment facilities. Ensure that new development responds positively to the layout of historic settlements;
- Mountain passes and 'poorts' of scenic and heritage significance include the Swartberg Pass (Provincial Heritage Site), Gamkaskloof Pass, Meiringspoort, Seweweekspoort (all in the Swartberg range), as well as Molteno Pass in the Nuweveld range. The Karoo National Park near Beaufort West is a protected landscape incorporating the Great Escarpment. The Department of Environmental Affairs and Development (DEA&DP) should ensure the protection of these cultural and scenic landscapes through the preparation of design guidelines for new development; and,
- Karoo farm stays throughout the municipality, particularly heritage properties.

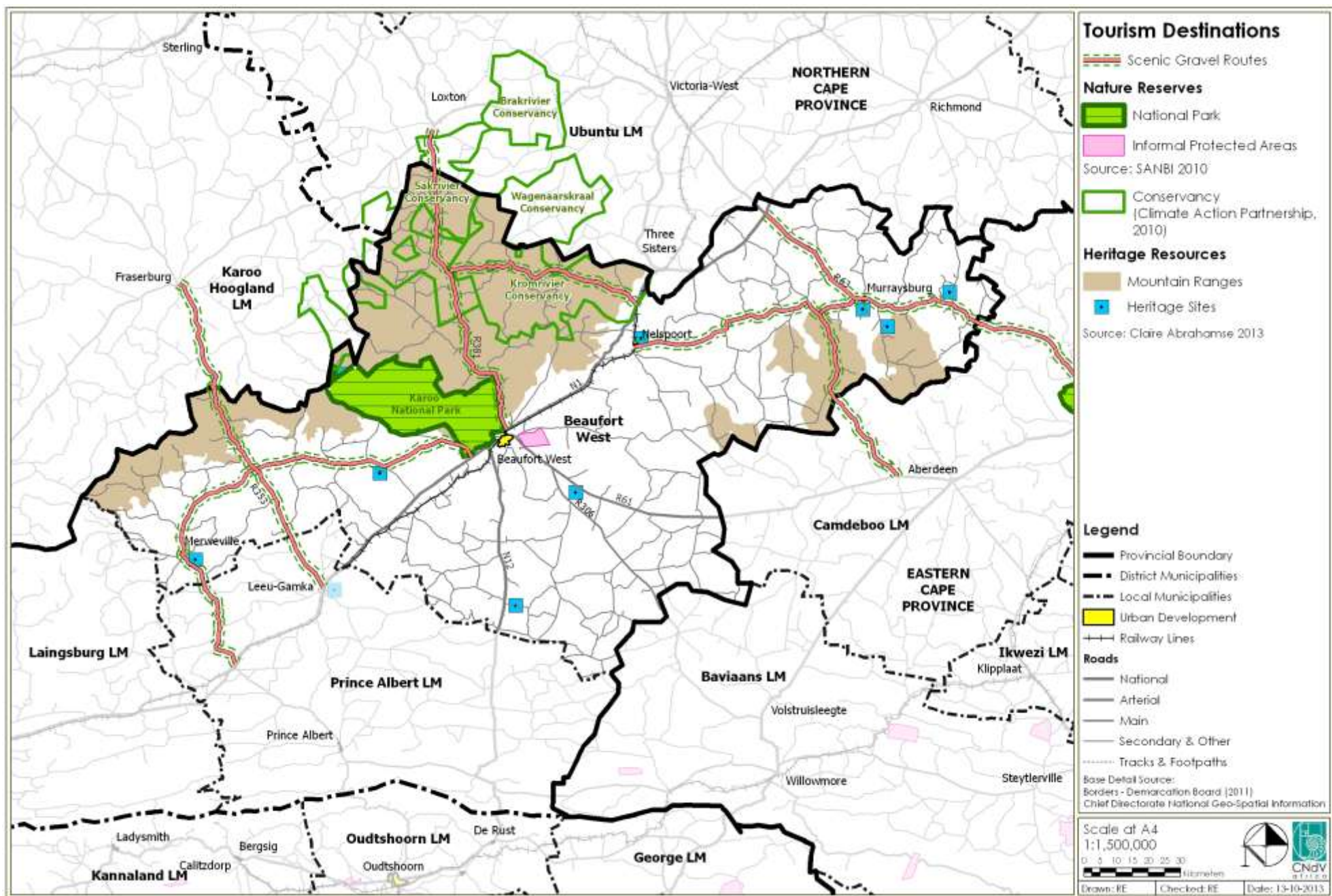


Figure 5.3.5.1 Major Tourism Destinations

5.3.6 LAND REFORM

- Land reform opportunities should not be targeted only at agricultural operations although this will always be the major activity;
- Bio-diversity conservation and eco and agri-tourism operations should also be considered;
- Thus, land reform projects located in the Nuweberg, for instance, between the Karoo National Park and the Krom and Sak River conservancies should also explore eco-tourism and bio-diversity conservation opportunities;
- The majority of the land reform projects are located on the degraded soils of the Sout River "badlands" where intensive conservation measures will be required to improve the stock and therefore livelihood carrying capacity of this region; and,
- Future land reform projects should carefully consider the context in which they are located and then seek to take advantage of that area's opportunities, not only in agriculture.

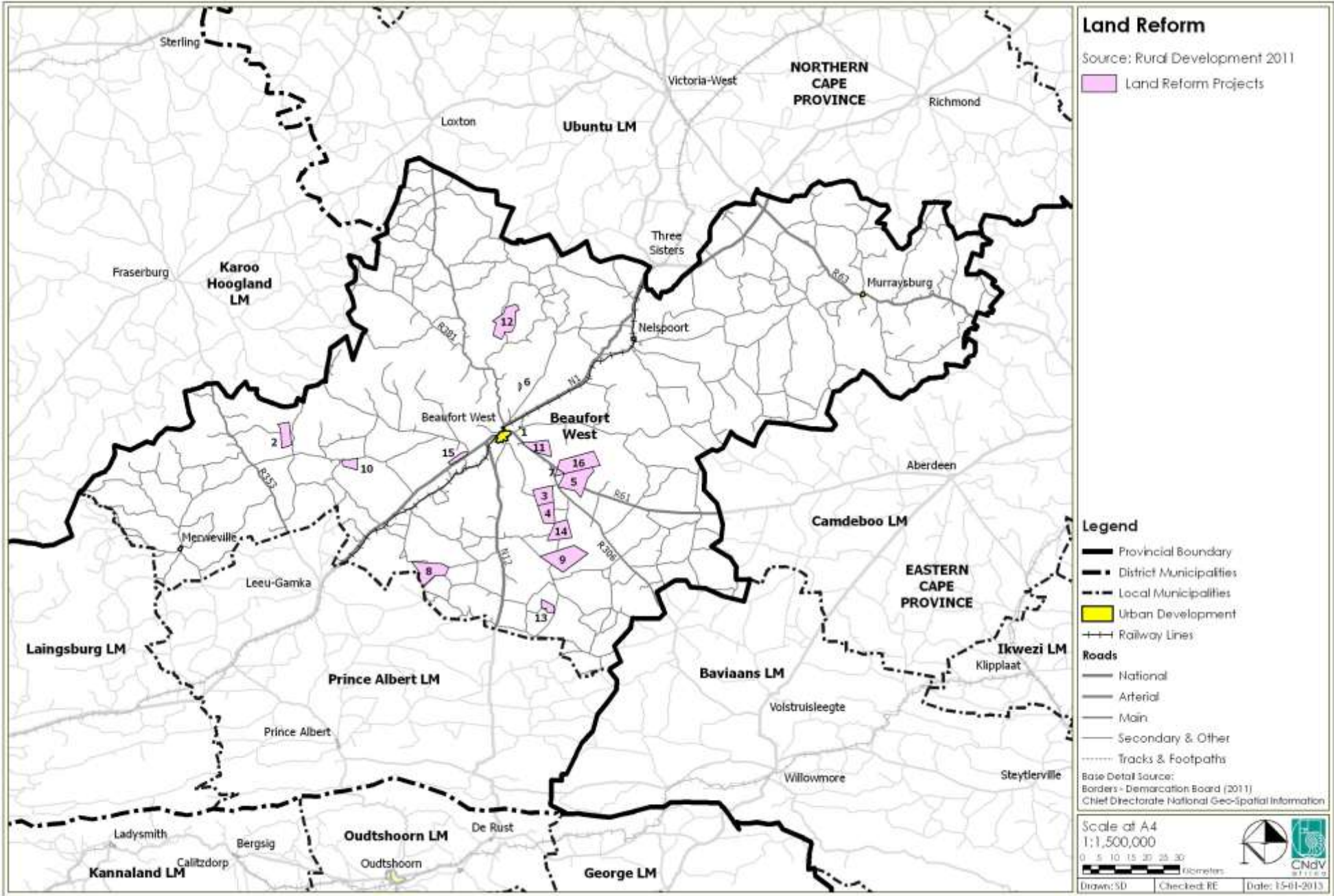


Figure 5.3.6.1 Land Reform Projects (Rural Development, 2011)



5.4 URBAN RELATED DEVELOPMENT

5.4.1 SETTLEMENT GUIDELINES

General principles to “aspire” to:

5.4.1.1 Walking Distance as the Primary Measure of Access

The need to ensure that people have access to a variety of opportunities is implied in a number of the DFA principles (S3(c)(i), (iii)). This requires an understanding of the relationships between different activities in terms of spatial proximity (close and far), access and time.

In the past accessibility has usually been considered in terms of travel time in private vehicles, however, this measurement is not only environmentally unsustainable, as it is mostly dependent on access to private motor vehicles but also reflects a denial of the reality that the majority of our citizens do not have private vehicles, may not always be able to afford public transport and thus have to spend significant time and energy walking to fulfil their needs.

Thus appropriate **walking distance** should always be used as the measure for accessibility. 20 minutes or 1km is regarded as an acceptable distance to walk and should be used as a basis of settlement design, see Figure 5.4.1.1.

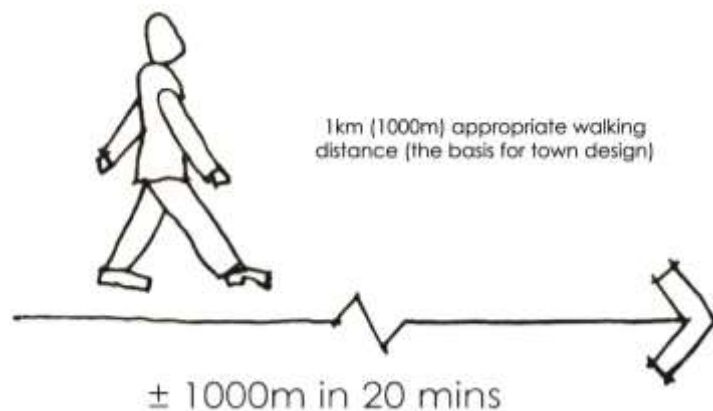


Figure 5.4.1.1 Walking distance

5.4.1.2 Land use integration and interface

The implementation of the walking distance principle to promote greater access to opportunities for all people, will require the functional integration (DFA principles S3 (c)(i),(iii),(v)) of urban activities. At least **50% of urban activities** should be **within walking distance** of where people live, see Figure 5.4.1.2.

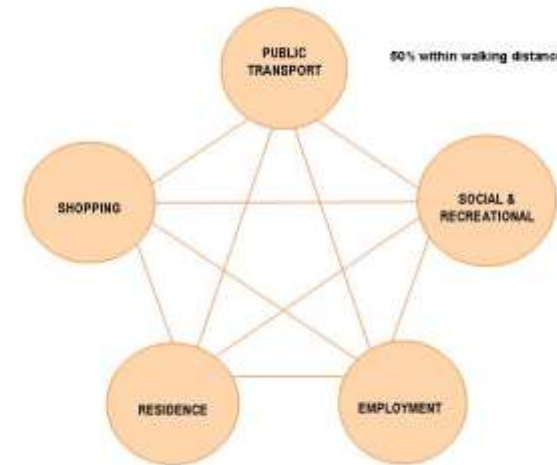


Figure 5.4.1.2 Integration of Urban Activities

The intensification areas are seen as the prime instruments for promoting integration between the towns and townships of the urban settlements.

Principles:

- **Locate activities (residential, transport, work, recreation, etc.) so that at least 50% of them are in walking distance;**
- **Locate most frequented activities in the most central / accessible localities, e.g. industrial and commercial;**
- **Use all well located vacant land, i.e. within 1 to 2kms of urban centres;**
- **Locate all future residential areas within walking distance of urban centres where space permits; and,**

Interface principles:

- **The change between different housing typologies must happen along the midblock and not across the street;**

- **Residents must be given freehold tenure, i.e. title deeds immediately so that shack upgrading will commence as soon as possible; and**
- **The more formal the units the closer they should be to the main public thoroughfare or adjacent upmarket housing.**

5.4.1.3 Socio-Economic Integration

The principle of access and integration, also requires socio-economic integration (DFA principle S3(c)(i),(vii)). Little progress has been made in this regard since the advent of democracy. In reality there is often community resistance to integration of poor, middle and high income communities, and bank valuers often downgrade property values where informal settlements or low income housing is provided in close proximity to middle and high income housing. The use of a **socio-economic gradient** with relatively small differences in income and property value between adjacent communities can help mediate this problem.

Figure 5.4.1.3 illustrates how a high level of socio-economic integration can be achieved in a 1km radius, applying this principle.

In particular efforts should be made to locate low income neighbourhoods nearer to the core or nodes of settlements and away from the periphery.

Principles:

- **Sensitively locate the income groups within the 1km radius : e.g. very low not right next to the very high income;**
- **The arrangement of the housing for the various income groups should be according to the principle of the socio-economic gradient with the higher end of the market closest to the main thoroughfare, see Figure 5.4.1.3;**
- **As a general rule Human Settlement schemes should not be targeted at a single income group exclusively, usually subsidy or Site and Service, but should always include at least a GAP housing and top structure subsidy component even if only comprising 10% or 20% of the units;**
- **Locate all future subsidy housing within walking distance of nodal centre where space permits.**

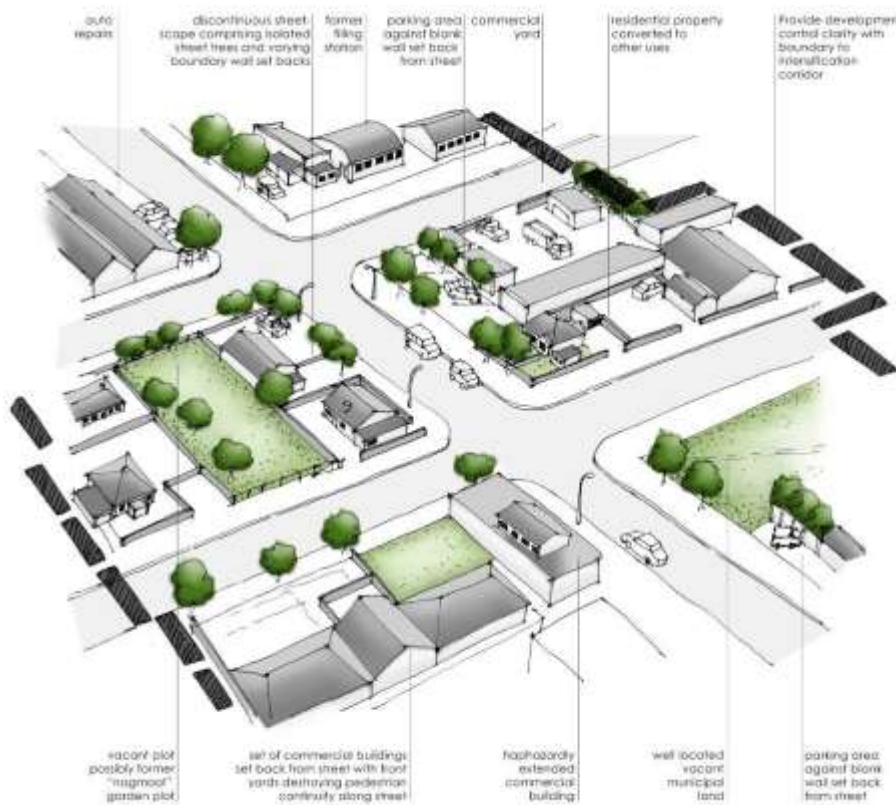


Figure 5.4.1.3 Socio-economic integration and interface treatment

5.4.1.4 Intensification Corridors and Linkages, see Figure 5.4.1.4

Principles:

- **Sensitive infill and redevelopment of major arterial axis in clearly defined precincts;**
- **Corridors to concentrate activities and support its speedy initiation especially in more rural areas, should be delineated to include one erf on either side of the identified street, otherwise called the spine of the corridor;**
- **Show sensitivity towards existing heritage buildings;**
- **Enhancing the street experience through landscaping and guiding the architecture of new developments;**
- **Encourage a multiple level of entry into the economic market and enhance job creation, the intensification corridors should be limited to residential, office and retail uses and only compatible light industrial uses, e.g. non-nuisance manufacturing or craft activities that may require a retail outlet on the same premises.**
- **Define a single uniting structure of intensification corridors, nodes and linkages between town and township; and,**
- **Encourage supporting densification pattern and infrastructure provision.**



Before Development



After Development

Figure 5.4.1.4 Intensification Corridors

5.4.1.5 Sub-centre Nodes

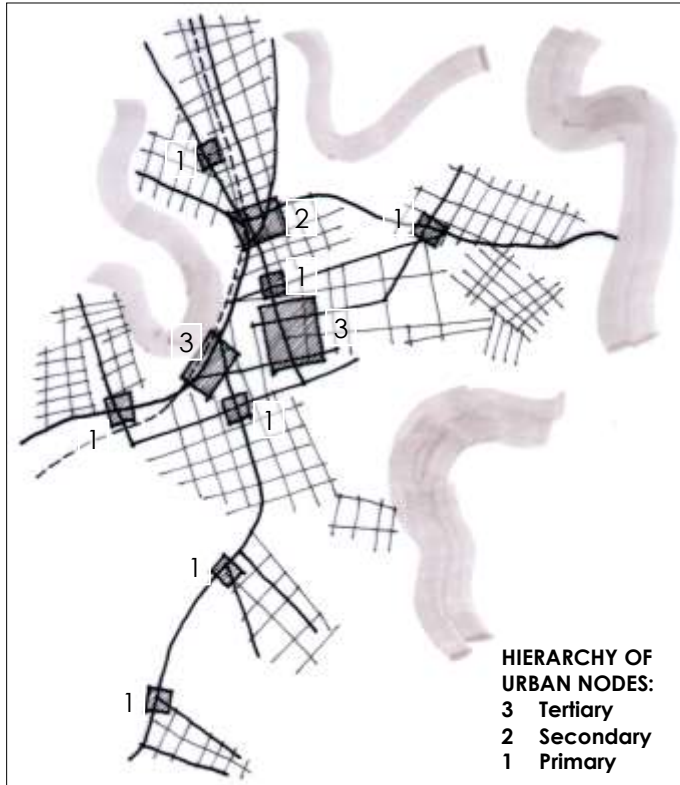
This will be shown at town level.

Three levels of hierarchy of urban nodes containing business and community facilities shall be clustered together as far as possible to provide satisfactory access and clustering of activities, see Figure 5.4.1.5:

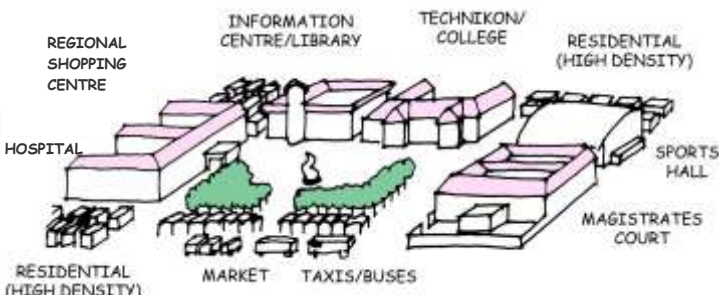
- Tertiary: technikons, hospitals, courts, multi-purpose centres, regional or metropolitan transport interchanges, museums, art galleries, indoor sports complexes, regional shopping centres;
- Secondary: high schools, day care centres, hospitals, libraries, sports and community halls, sports fields;
- Primary: primary schools, crèches, clinics, bus and mini-bus taxi stops; and
- Nodes should be managed to concentrate the business therein and where growth is required, the node should be encouraged to grow along the corridor towards each other. This is to manage and prioritise in a strategic manner, the implementation of needed infrastructure and to provide the greatest opportunity of success of these business.

Principles

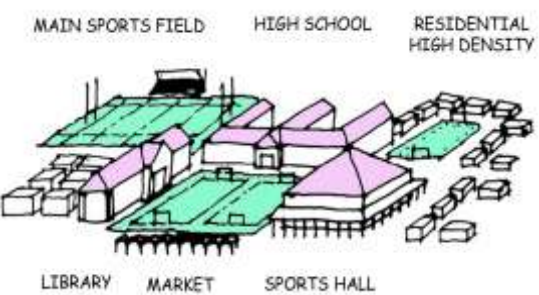
- ***Implement projects on a focused, strategic and hierarchical basis with the largest investments for higher order facilities that will be enjoyed by the greatest number of people.***



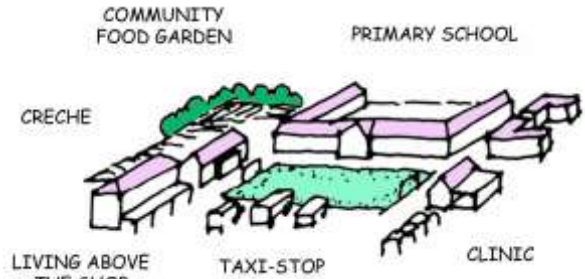
Clustering Civic, Commercial and Residential Activities



Tertiary Cluster of Facilities



Secondary Cluster of Facilities



Primary Cluster of Facilities

Figure 5.4.1.5 Sub-Centre Nodes

5.4.1.6 Urban Edge

These should be reviewed to ensure that:

- Sufficient protection is given to land requiring protection, inter alia, the agricultural land currently under cultivation and CBAs;
- That compaction rather than expansion of urban settlements is encouraged to promote non-motorised transport modes where appropriate;
- Urban Edges which provide sufficient land for the development of the needs of the area for about 20 years, given the current growth rate, is proposed around the exiting urban footprint; and,
- It is proposed that these urban edge only be realigned based on actual need and once all the existing under or unutilized vacant land has been developed.

5.4.1.7 Infill, Densification and the Suburbs

It is clear that significant infill and densification is required in order to restructure the settlements in the Municipality.

Further development in the settlements must respect and continue the layout and design features of the historical settlement, such as the continuation of the grid layout, as well as following architecturally similar buildings, landscaping and urban design. Well located land has been identified to contribute to this important goal.

Guidelines for the settlements will be given.

5.4.1.8 Wind and Solar Farm Siting Principles

The following wind farm siting principles are proposed to be used as a first set of questions to guide potential developers of wind and solar farms. Terrain suitability need to be investigated and should include the following typical aspects in the design process:

- Slopes by gradient classes
- Rocky areas
- Soil type and permeability
- Natural watercourses and areas with high water table, Rainfall data; and,
- Vegetation.

• Slope

- Wind Potential – slopes up to a certain gradient orientated towards prevailing wind directions tend to augment average wind speed;
- Visibility – wind farms on slopes have increased visibility;
- Road layout and design – slopes to be considered in road layout to reduce erosion potential of road run-off, rock-fall and landslide potential;
- Tower foundation design – need to consider falls across the platforms; and,
- Re-vegetation – steep road verges and cuts require re-vegetation to reduce sedimentation from run-off.

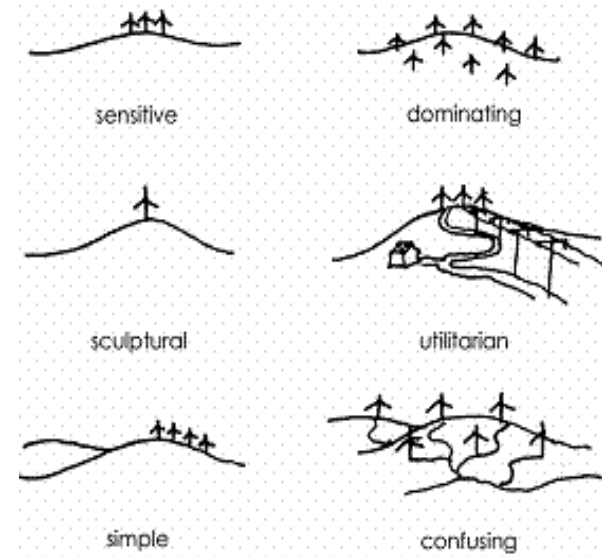


Figure 5.4.1.8a Location options for wind turbines

• Geology

- Need highly stable underlying geology for heavy wind turbines; and,
- Investigate existence of bedrock, subterranean voids and possible seismic activity

• Soils

- Potential for erosion; and,
- Soil types influence road construction and re-vegetation.

• Surface Hydrology & Groundwater

- Design of roads and treatment of runoff from roads and disturbed surfaces to reduce sedimentation and eliminate erosion.



Figure 5.4.1.8b Wind farm near Klipheuwel outside Durbanville, Western Cape

- **Vegetation**
 - Detailed vegetation assessment if the proposal is not in an agriculturally disturbed area;
 - Assessment should include location and condition of:
 - Extent of disturbed or alien vegetation;
 - Extent of any natural vegetation;
 - Indigenous and endemic species; and,
 - Rare and threatened species;
 - If the site is affected by CBAs.

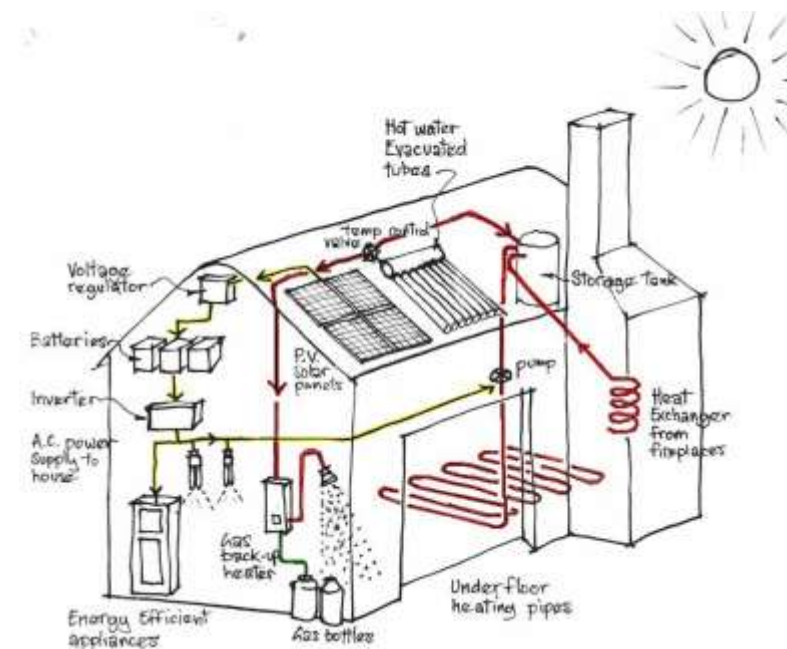


Figure 5.4.1.8c Visual simulation of wind turbines, Western Cape

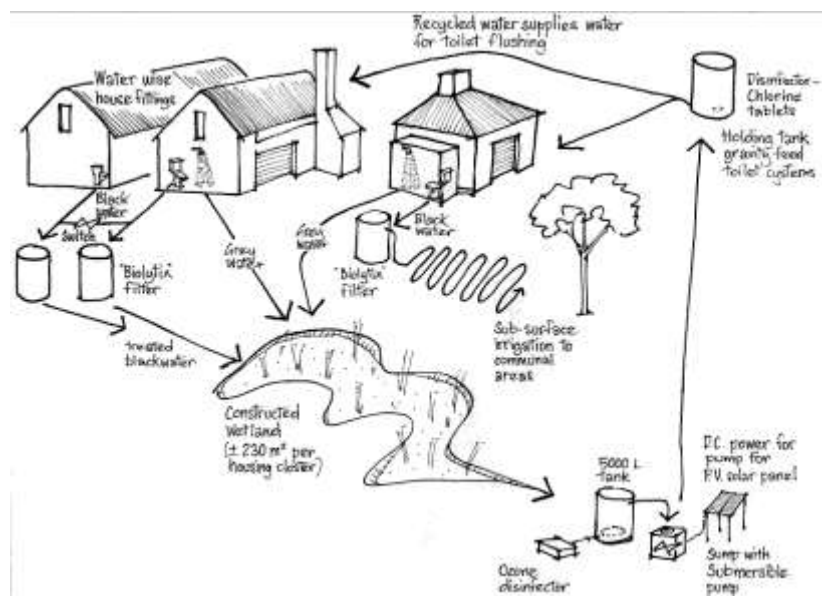
5.4.1.9 Infrastructure

The following principles shall apply:

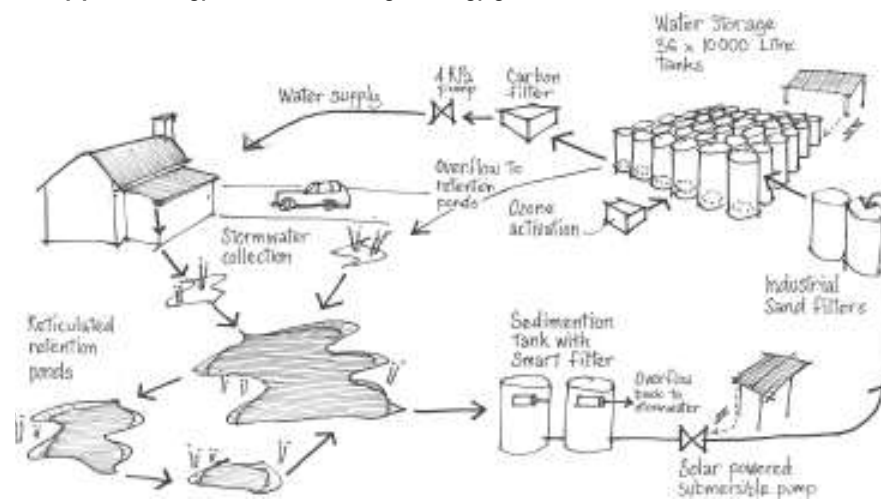
- Ensure a base level of services only is available for all residents in the Municipality including those households qualifying for indigent grants;
- Where possible implement GAP housing schemes as part of subsidy projects so as to help cross-subsidise required infrastructure projects;
- For low density settlements, where the high cost of conventional grid services are prohibited and not preferred and to promote sustainable use of natural resources reduce dependency on conventional grid services, the following are proposed:
 - Promote the use of solar hot water projects so as to help cross-subsidise infrastructure costs;
 - Promote use of solar of water heaters, PV panels, grey-water recycling, waste separation at source, and passive building design to as to minimize energy, solid waste and water demand, see Figures (a) and (b); and,
 - Encourage rainwater harvesting and grey water (water from hand basins and kitchen sinks) recycling, see Figure (c).



(b) Solar Energy Generation for off-grid energy generation



(a) Sanitation System based on sustainable principles



(c) Rainwater harvesting for sustainable use of water

Figure 5.4.1.9 Off-grid infrastructure options



5.5 CLIMATE CHANGE

5.5.1 Landscapes that provide resilience to climate change need to be protected. In this regard the following areas are important, see Figure 5.5.1:

- Kloofs, which provide important connectivity and provide both temperature and moisture refuges;
- Topographically diverse areas, which contain important altitudinal and climatic gradients which are important for climate change adaptation as well as ensuring a range of micro-climates are protected;
- Riverine corridors, which provide important connectivity in extensive arid environments; and,
- South facing slopes which provide refuge habitats.

5.5.2 Protect urban development from climate change high risk areas through determining a coastal setback line and increased setbacks from river corridors. Sea level rise and increased flooding, as a result of climate change, could have a more significant impact on urban development in these areas.

5.5.3 Promote solar and wind generation projects, to reduce the need for coal and the generation of greenhouse gasses, for the generation of renewable energy in the south west of the municipality with due consideration of the following design and layout aspects as per the PC 20/2012 (23 November 2012):

- Land use restrictions:
 - Height:
 - A maximum height of 200m for a wind turbine, measured from the mean ground level of the footprint of each structure to the highest point of the blade.
 - The height of a structure for solar generation facilities will be technology-dependent.
 - The height of buildings is restricted to a maximum of 8.5m and is measured from the mean ground level of the footprint of the building to the highest point of the roof.
 - Setback

In the case of a wind turbine, a distance equal to 1,5 times the overall blade tip height of the turbine, measured from:

 - the nearest residential, commercial or critical agricultural structures such as animal housing, outbuildings, store rooms, excluding structures such as water troughs, feed dispensers, and windmills;

- the cadastral boundary of the land unit;
- any public road or private or public right of way; and,
- (iv) any electrical infrastructure.

- Additional requirements:
 - Site Development Plan (SDP)
 - As part of the application or as a condition of approval, a SDP must be submitted to the competent authority. The site must be surveyed and the exact delineation of the construction footprint must be shown in the SDP;
 - To the extent necessary, any relevant measures contained in these regulations must be incorporated into an SDP; and,
 - Initial measure in the event of failure.
 - Visual and environmental impact
 - Visual and environmental impacts must be taken into account for height determination and in general, to the satisfaction of the competent authority.
 - Finishing and Colour
 - A wind turbine structure must be treated with a neutral, non-reflective exterior colour designed to blend with the surrounding natural environment, to the satisfaction of the competent authority; and,
 - A solar structure may not cause any adverse effects due to its reflective nature and must be designed and erected accordingly, as required by the competent authority.
 - Areas of the Central Karoo have been identified as proposed Renewable Energy Development Zones (REDZ) as part of the National Strategic Environmental Assessment for Renewable Energy. The intention of the project is to identify REDZ that will be delisted in terms of the Environmental Impact Assessment (EIA) regulations, thereby promoting renewable energy activities in specific areas across the country;

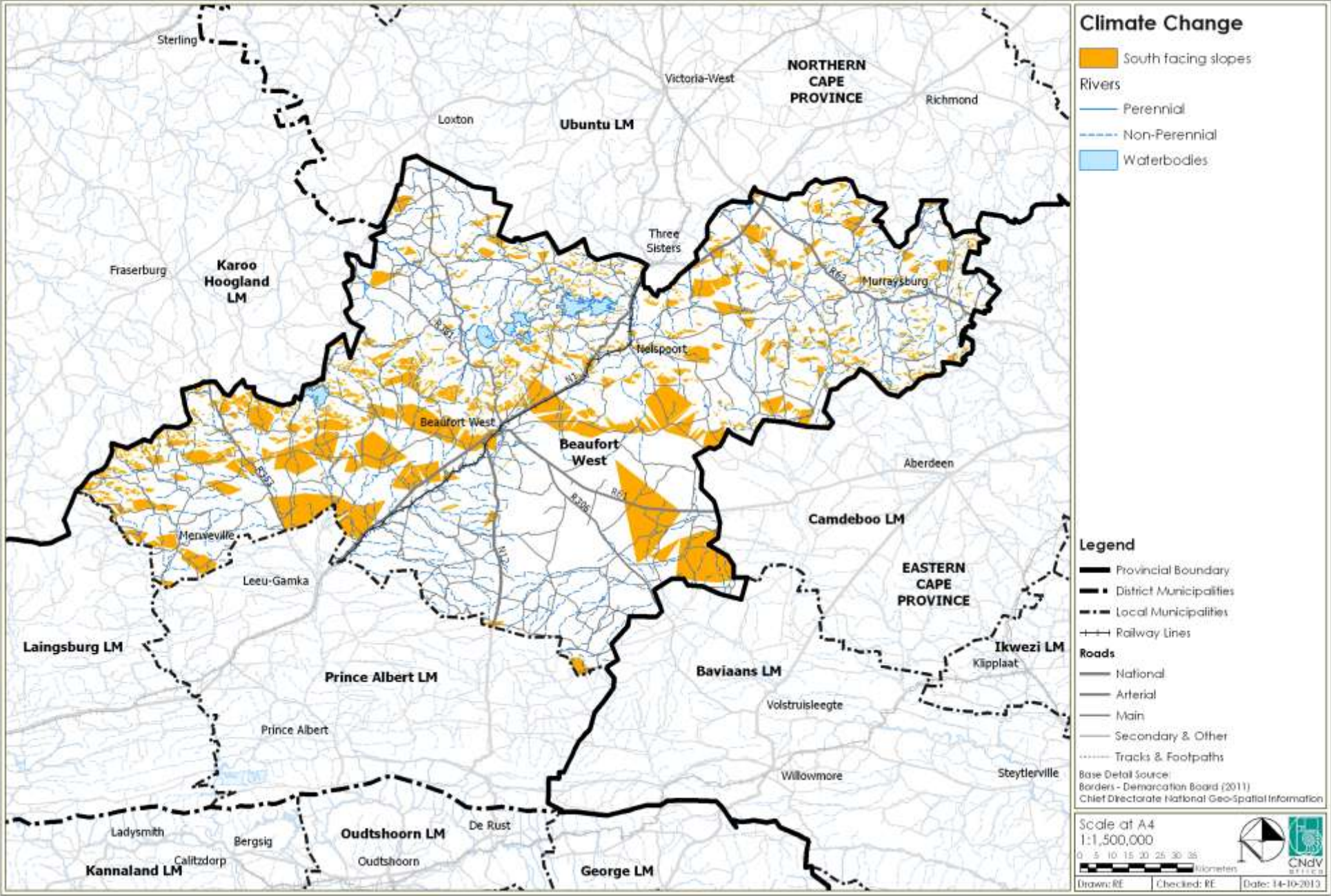


Figure 5.5.1 Climate Change

5.6 URBAN DESIGN GUIDELINES

UD1 Create open space systems that integrate the elements of a settlement to contribute to a meaningful urban structure. This can be done by:

- Providing connectivity between open spaces;
- Establishing linkages between open spaces;
- Aligning the open space system with public buildings; and
- Ensuring an improved quality of linkages through the continuation of special activities or functions along major routes.

UD2 Link symbolic elements (statues) or public facilities (library, clinic, etc.) to open spaces in relation to their importance and character.

UD3 Ensure the definition of the public spaces through the effective design of an interface between public and private domains.

UD4 Create visual recognition and surveillance along open spaces and public routes. This can be achieved through:

- Locating buildings around open spaces and streets so that sufficient enclosure is created;
- The appropriate height of buildings; and
- Locating the highest buildings to the southern side of the open space, with lower buildings or trees on the northern side.

UD5 Markets should be permitted at highly accessible locations in terms of the movement network and urban structure to ensure the greatest viability possible. These locations could be modal interchanges and intersections.

UD6 As a general rule the erection of shopping centres on the periphery of settlements should be discouraged. This should only be permitted if the intention is to initiate a new urban node at the specific location and the proposed shopping centre development is in line with the growth direction of the settlement.

The impact of a proposed shopping centre on the current main road or retail 'high' street must be assessed before it is approved.

UD7 Accommodate a variety of users in and uses along the streets by doing the following:

- Concentrate intensive activities along major vehicular and public-transport routes;
- Locate majority of public buildings and increase densities along these routes; and

- Locate buildings closer rather than further from the streets to increase pedestrian activity, a sense of enclosure and surveillance.

UD8 Create appropriate road cross-section widths that can provide for vehicle traffic, parking, pedestrian movement, cycling and landscaping.

UD9 Urban block length should promote access (penetration) and encourage economic activity by orientating the short side of blocks to major streets wherever possible.

UD10 Space buildings from each other to provide adequate solar access to buildings. In this regard the roof pitch of buildings should be orientated so that roof solar panels have a maximum continuous direct access to the sun.

UD11 Any proposals for the redevelopment of existing buildings should consider their heritage value, elements of the vernacular architecture and, where possible, retain these important elements. Similarly, the historical characteristics of existing buildings should be considered to draw from their elements that could be integrated into the design and construction of new buildings close by.

UD12 The use of local materials should be encouraged in the construction of new buildings.

UD13 Encourage appropriate water-wise landscaping.

UD14 Ensure that the main streets of the urban areas are appropriately landscaped to encourage a pleasant gateway treatment into the settlements.

UD15 Each development action undertaken in each settlement of the Municipality must be viewed and assessed in terms of the degree to which it either contributes or detracts from the heritage and tourism potential of the Municipality.

5.7 POTENTIAL RURAL NODES AND PERIODIC RURAL MARKETS

The potential of rural nodes is derived from the rural economic opportunities that are generated by their location and "attracting force". However, in some nodes these forces are so small that permanent infrastructure or services cannot justify permanent buildings or staff.

Initially, these nodes, can be supported through periodic markets at which mobile services, for instance, home affairs, pension pay outs, clinics, libraries can be dispensed.

This approach could be applied at settlements with low threshold populations to ensure that the necessary services can be provided.

Where such facilities do not exist, periodic service centres should be established for co-ordinated use by a wide variety of government, non-government and private organisations.

These periodic service centres should be located at points of highest access according to the same principles.

The services of various government departments and private sector organisations should be co-ordinated into a mobile caravan of dedicated buses and vans which travels from periodic service centre to periodic service centre stopping for morning or afternoon sessions as appropriate.

Local arts and crafts people and business people should be encouraged to trade in the stop-over periods of the mobile service caravans at the periodic service centre. The location of shops and abattoirs should also be encouraged here.



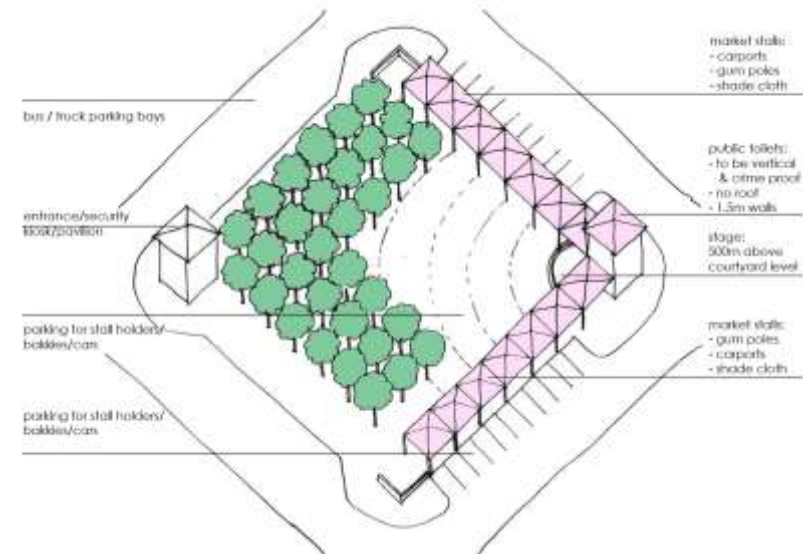
Library bus



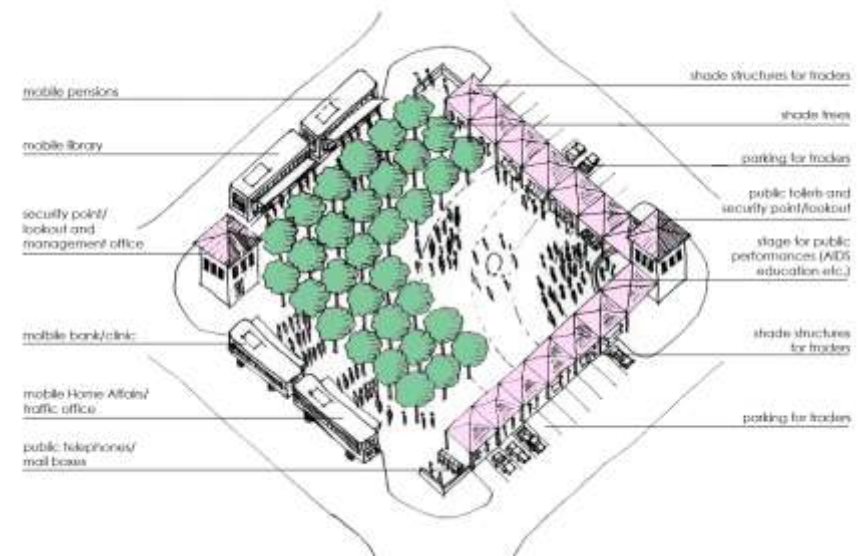
Home Affairs bus



Mobile clinic



Periodic service concept



Periodic service activities

5.8 SETTLEMENT HIERARCHY AND STRUCTURE

Beaufort West Municipality's settlement hierarchy and structure comprises the following system:

- N1 corridor – comprises Beaufort West town as the primary settlement in the municipality;
 - It has the highest priority in terms of infrastructure investment ranking in the Growth Potential Study as being a settlement with high social needs and high economic development potential with a population of over 5 000 people;
 - The primacy of Beaufort West town is likely to increase over time as the various economic sectors it currently serves continue to grow at whatever rate, even if only because of its strategic location. If the settlement's maintenance and management improves it is likely to improve even faster;
 - If the various potential mining activities take off in the next decade Beaufort West town's growth could rapidly accelerate. In this case it will be extremely important to ensure that the correct planning and management policies and activities are in place to avoid the unplanned and unmanaged growth currently being experienced by towns under this kind of pressure in the northern cape and elsewhere;
 - Merweville and Murraysburg are two remote outlying settlements in the municipal periphery off the N1. They are both ranked much lower in terms of their settlement growth potential as having high social need but low economic development potential;
 - Murraysburg, owing to its more fertile agricultural hinterland and its strategic location on the minor link road R63 between Victoria West and N1 and Graaff Reinet sustains a greater urban and rural population than Merweville.
 - Murraysburg has far stronger functional linkages to Graaff Reinet in the Eastern Cape than to any of the other towns in the Municipality primarily due to its distance from Beaufort West.
 - Merweville is located on a gravel link road to the N1 and is not really on the route to anywhere else. There is a potential scenic gravel route leading directly to Beaufort West town but this would not be used by business traffic wishing to get there as quickly as possible;
 - Nelspoort used to be located on the N1 when it followed the rail line but this section has now been bypassed. This has left the village on a crescent route that functions as more of a backwater; and,
- It was not rated in the Growth Potential Study.

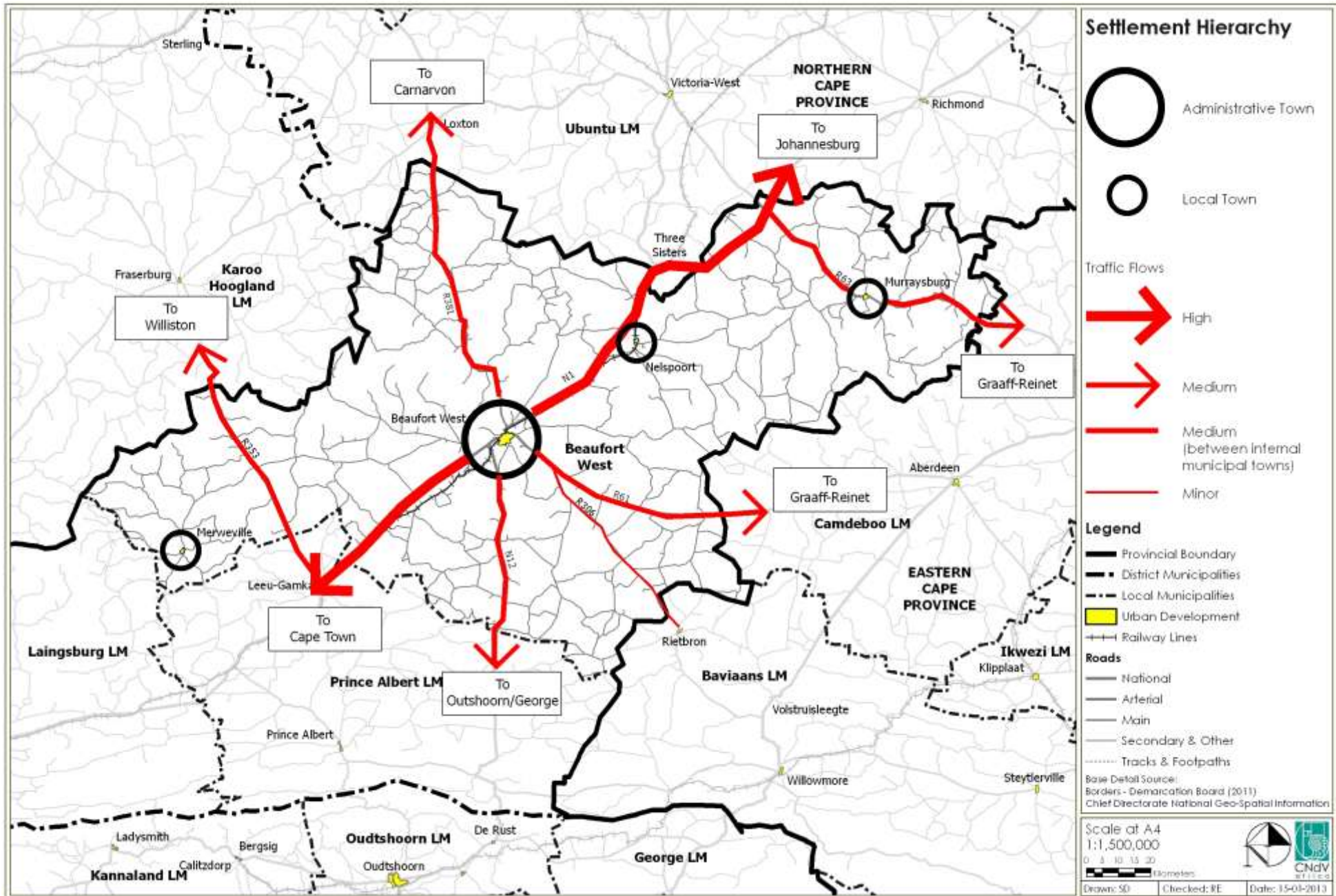


Figure 5.8.1 Settlement Hierarchy

