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GROWTH POTENTIAL STUDY

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EXECUTIVE SUMMARY

This study determined the growth potential and socio-economic needs of settlements in the Western Cape outside of the Cape Town metropolitan area using quantitative data (e.g. factors relating to socio-economic, economic, physical-environmental, infrastructure and institutional aspects). The results of the quantitative analyses were combined with qualitative information (e.g. stakeholder engagements) to identify potential interventions that might unlock latent potential within settlements and regions.

The quantitative analysis of growth potential was based on two fundamental and related concepts: inherent preconditions for growth and innovation potential. Five thematic indices (Figure X1) were developed as the basis for modelling the growth preconditions (economic, physical, and infrastructure) and innovation potential (institutional and human capital) within each settlement and municipality.

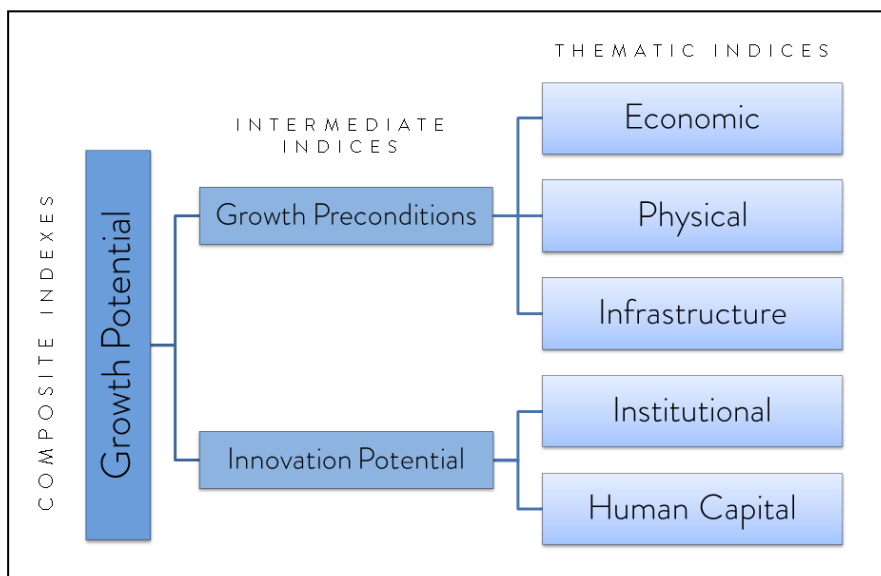


Figure X1 Thematic indices used in the growth potential index

The analysis of growth potential must however also be framed within the context of the socio-economic needs within settlements and municipalities. A socio-economic needs index based on the methodology and criteria of a similar index developed by the Western Cape Department of Social Development at municipal and ward level was implemented at settlement level. This index (Figure X2) is based on four thematic indices (i.e. *Household Services, Education Level, Housing Needs, and Economic Characteristics*). Two variants of this index were developed: one based on real values (number of households in need) and the other on proportional values (proportion of households in need).

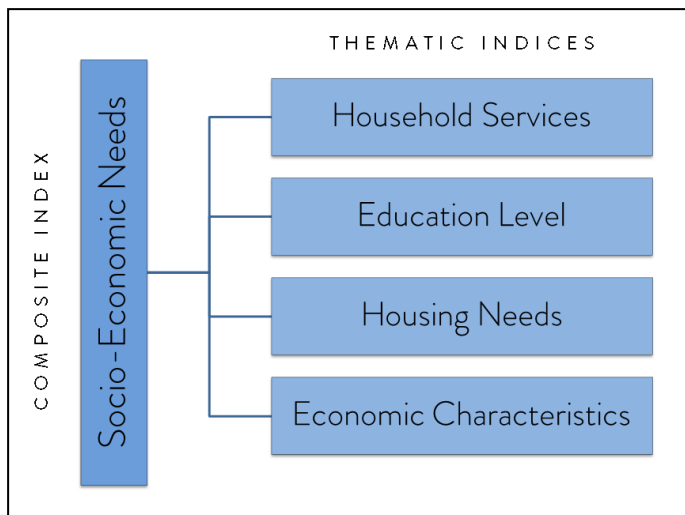


Figure X2 Thematic indices used in the socio-economic index

The results of the quantitative analysis can be summarized by cross-tabulating the classification of settlements according to socio-economic needs and growth potential (see Table X1). Towns such as George, Mosselbaai, Paarl and Stellenbosch, located in the bottom right of the table, are classified as having both very high growth potential and very high socio-economic needs (expressed in absolute terms). Development and investment in these towns will thus have a significant impact to support economic growth and development, and supporting socio-economic development imperatives. The same principle applies to other towns in this part of the table (although not at the same level of intensity) such as Ceres, Grabouw, Plettenberg Bay, Worcester, Hermanus, Knysna, Malmesbury, and Vredenburg. Towns and settlements in the bottom left quadrant of the table (e.g. Betty's Bay/Pringle Bay and Wilderness) are characterised by a high or very high growth potential; but very low socio-economic needs. The type of investment and development in these areas are thus likely to be very different (e.g. investment in tourism infrastructure) from those in the bottom right part of the table. Settlements in the top right section of the table represent areas with high or very high socio-economic needs but with limited growth potential. Towns such as Beaufort West and De Doorns fall within this category and would again require a different type of development and investment response than the former two examples. The position of individual settlements in this table does not imply that development and investment will only take place in certain areas and not in others. What it does imply is differentiation in scale and intensity and support tailored according to the governing circumstances in each area. A spatial representation of this result is shown in Figure X3.

Table X1 Settlement-level socio-economic needs (absolute) cross-tabulated with growth potential

		Socio-economic needs				
		Very low	Low	Medium	High	Very high
Growth potential	Very low	Bitterfontein Doringbaai Kliprand Leeu Gamka Matjiesfontein Merweville Nuwerus Rietpoort Strandfontein Volmoed	Calitzdorp De Rust Dysselsdorp Murraysburg Prince Albert Touwsrivier Zoar			
	Low	Arniston Aurora Ebenhaesar Elim Graafwater Haarlem Herbertsdale Koekenaap Kurland Pearly Beach Redelinghuys Slangrivier Struisbaai Suurbrak Witsand	Goedverwacht Klaver Ladismith Laingsburg Lamberts Bay Lutzville Uniondale Vanrhynsdorp	Citrusdal Clanwilliam Op-die-Berg Tulbagh Vredendal Wolseley	Beaufort West De Doorns	
	Medium	Buffelsbaai Dwarskersbos Eendekuil Elandsbaai Frimersheim Gouda Gouritsmond Greyton Jongensfontein Koringberg McGregor Napier Nature's Valley Paternoster Yzerfontein	Albertinia Barrydale Botrivier Darling Genadendal Heidelberg Hopefield Klapmuts Rawsonville Rheenendal Riviersonderend Saron St Helena Bay Stanford Velddrift	Ashton Bonnievale Bredasdorp Franschhoek Montagu Piketberg Prince Alfred Hamlet Riversdale Saldanha/Jacobsbaai Swellendam Villiersdorp	Ceres Oudtshoorn Robertson	Wellington
	High	Wilderness	Kalbaskraal Kleinmond Langebaan Pniel/Kylemore Sedgefield Stilbaai	Caledon Gansbaai/Franskraalstrand Moorreesburg Porterville Riebeek-Kasteel/Riebeek- Wes	Grabouw Plettenberg Bay/Kranshoek/Wittedrif /Keurboomsrivier	Worcester
	Very high	Betty's Bay/Pringle Bay			Hermanus/Onrus/Haw- ston Knysna/Brenton-on-sea Malmesbury Vredenburg	George/Heroldsbaai Mosselbaai/Groot Brak Paarl Stellenbosch/Jamestown

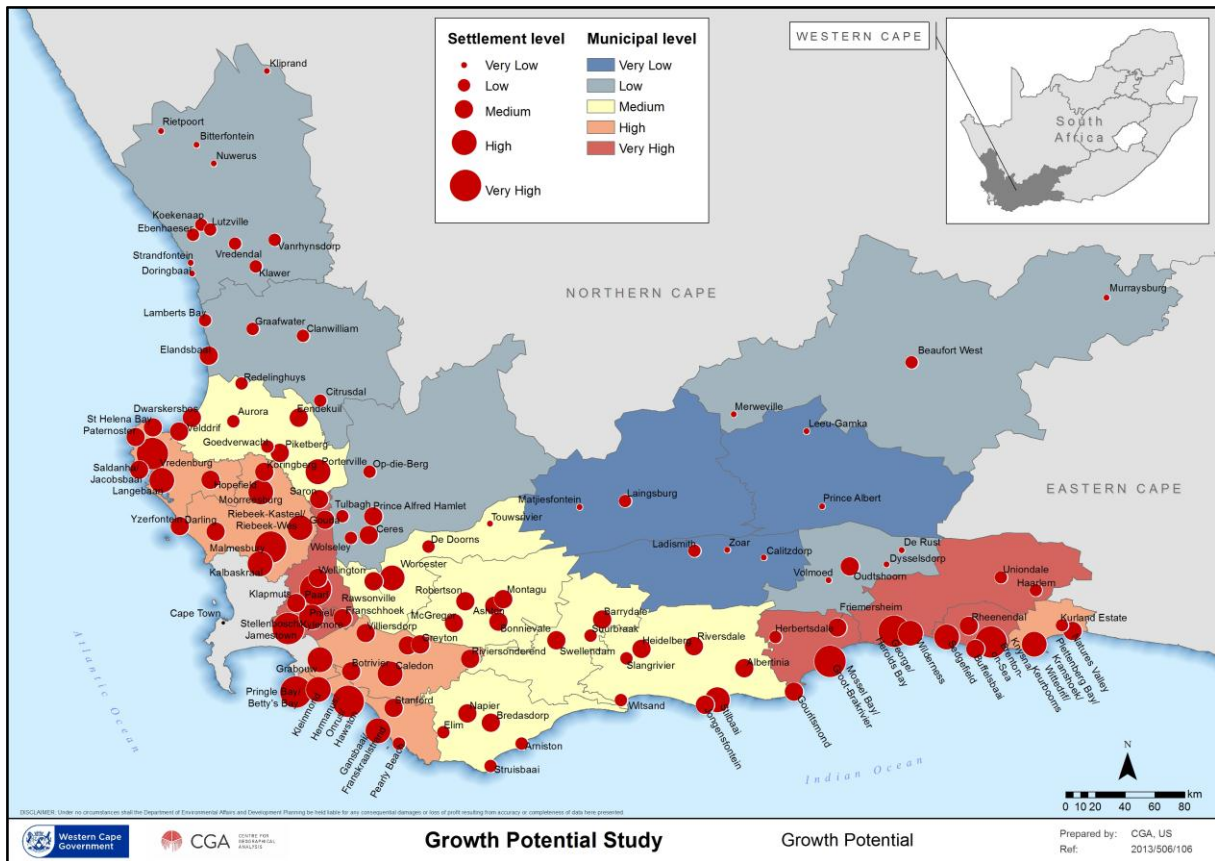


Figure X3 Spatial representation of the Growth Potential Index at settlement and municipal level

From interactions with users of the previous GPS products it became clear that these products were not always applied in the most effective and appropriate manner. Many users simply applied the overall composite *Growth Potential Index* (see Figure X3) for widely differing decision support requirements and ignored the other more targeted indices and indicators that the GPS provides. Several spatial indices and indicators aimed at supporting a range of decision support activities were thus developed in the GPS2013. It is critical for users to understand that the thematic and composite indices provide an overall perspective of growth potential and socio-economic needs in the Western Cape, with its primary application to inform and guide strategic and cross-cutting decisions at a provincial level (see Table X2). These composite indices are, however, not the only decision support tool available for more detailed applications such as informing specific programmes within individual departments.

Table X2 Application levels of GPS2013 indices, indicator bundles and individual indicators

	Provincial Strategic Level Guidance	Cross-cutting Strategic Objectives	Individual Departmental Programmes & Objectives	Programme or Project-Specific
Composite Indices	●	○	○	○
Thematic Indices	○	●	○	○
Indicator Bundles	○	○	●	○
Individual Indicators	○	○	○	●

● Primary application

○ Secondary application

In addition to the composite and thematic indices, the GPS2013 also demonstrates the value of “indicator bundles” that can more effectively inform decisions relating to specific departmental programmes and objectives. For example, by applying four GPS2013 indicators that directly relate to housing (*% Households living in informal housing, Level of overcrowding, Population growth rate and In-migrants*) a geographical perspective can be created of the spatial distribution of housing need and influencing factors. At a fourth level of application, individual indicators may in some cases also be appropriate for guiding specific interventions, programmes and projects.

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1. INTRODUCTION

1.1 Rationale and overview

One of the objectives of the Department of Environmental Affairs and Development Planning (DEA&DP) is to undertake spatial planning that promotes and guides the sustainable future development of the province and redresses spatial inequalities. This goal led to the development of the Provincial Spatial Development Framework (PSDF), which identifies the areas of growth in the province and the areas where, in terms of the sustainable development paradigm (or responsible development paradigm), growth should be emphasised in the future. It also addresses the form that this growth or development should take and further emphasises the restructuring of urban settlements to facilitate their sustainability. To provide guidance and support for implementing the PSDF, a thorough understanding and knowledge of the characteristics and performances of all the settlements in the province is needed.

The province contains 131 towns outside the Cape Town metropolitan area¹. Some of these settlements have solid developmental bases and experience dynamic growth, whilst others are stagnant or are declining. Settlements with declining populations, economic activities, services and infrastructure leads to decreasing social and economic service levels in the surrounding hinterland, which consequently impacts negatively on quality of rural life. The dynamics and intricacies of these problems and challenges must be approached in a coordinated manner.

Continued systematic research on the role and function of settlements (outside the Cape Town metropolitan area) within the developmental context of the Western Cape is required to provide a sound foundation to support well-founded strategic decisions. It is for this reason that a comprehensive study on the growth potential and functions of towns in the Western Cape was first completed in 2004. The results of the Growth Potential Study of Towns in the Western Cape by Van der Merwe, Davids, Ferreira, Swart and Zietsman (2004), henceforth referred to as "GPS2004", was instrumental in the gazetted Western Cape PSDF. The GPS2004 provided ground-breaking work by being the first study of its kind completed for a province within the context of the National Spatial Development Perspective (NSDP) and other related spatial and economic developmental policies. From this study four peer reviewed research papers were published, namely Van der Merwe, Ferreira and Zietsman (2005), Zietsman, Ferreira and Van Der Merwe (2006), Ferreira, Van der Merwe and Zietsman (2007) and Ferreira (2007).

In 2010, Stellenbosch University and the CSIR were contracted to review and update the GPS2004, primarily to ascertain whether any significant changes have occurred in the growth potential of settlements since 2004. The starting point of this follow-up study (Van Niekerk, Donaldson, Du Plessis & Spocter 2011), henceforth referred to as GPS2010, was to

¹ The actual number of settlements outside the metropolitan area is more than 131, but for the purposes of this study the settlements identified in the 2004 study was used for continuation purposes.

re-analyse the growth performance and development potential of the 131 settlements outside the Cape Town metropolitan area, especially with respect to their role in generating an environment for dynamic rural-urban development. The identification of settlements (and municipalities) with high development potential (and social needs) was of great value for development planning in the Western Cape and emanated in two peer-reviewed research papers (Donaldson, Spocter, Du Plessis & Van Niekerk 2012; Donaldson, Van Niekerk, Du Plessis & Spocter 2012). This research raised several important questions, including:

- What are the cross-boundary geographical relationships between settlements and how do they impact on development potential and social needs?
- What types of interventions are needed to stimulate growth and reduce social needs?
- What are the potential roles of various government sectors in implementing interventions?
- What is the potential role of the private sector and civil society in implementing interventions?

These questions lead to the conceptualisation and implementation of a follow-up project, called the "Second Phase" of the Growth Potential Study (GPS), henceforth referred to "GPS2013" in this document.

1.2 Aims and objectives of the current Growth Potential Study (GPS2013)

The original aim of the current Growth Potential Study (GPS2013), was to use the information collected during GPS2010 to investigate the spatial functional relationships between settlements in the Western Cape and to make suggestions about how the GPS2010 results can be used to support decisions regarding specific interventions to stimulate growth and reduce social needs. The following specific objectives were set:

1. Determine the spatial-economic inter-relationships between settlements;
2. Identify clusters of settlements with strong inter-relationships;
3. Identify sectors/industries per settlement cluster with high growth potential and identify potential value chains;
4. Suggest specific interventions per settlement cluster based on composite index and individual indicator performances;
5. Identify key interventions required per cluster through stakeholder engagement (qualitative assessment);
6. Identify potential roles of individual departments in implementing suggested interventions vis-à-vis departmental programmes and priorities; and
7. Identify priority areas for improved alignment between provincial departments and municipalities in terms of the outcomes of Objectives 5 and 6 above.

Although the initial intention was to use the GPS2010 indicators as basis for the objectives listed above, a significant proportion of the indicators used in 2010 were based on the 2001 Census and the 2007 Community Survey results. Consequently, the project steering committee requested that the GPS2013 be extended to allow for the indicators to be updated with the latest (2011) census data. An additional objective was consequently added namely:

8. Update the census-based indicators with the latest data and re-analyse the growth potential of settlements and municipalities.

The extension of the study resulted in several delays, effectively placing it on hold until May 2013 when the 2011 census data was released at the appropriate scale. The methods used to collect and analyse the data, the results that were obtained from the quantitative analyses, as well as the findings of the qualitative analyses are described in this report. The next section outlines the structure of the document.

1.3 Report structure

The remainder of this report is structured into six sections. The first section provides an overview of how growth potential can be unlocked in a national, provincial and municipal context. This is followed by two sections concerned with the quantitative component of the study. The first of these sections (Section 3) outlines the methodology used to model growth potential and socio-economic needs at settlement and municipal level, while the second focuses on the classification results. Section 5 summarizes the findings of the qualitative component of the study. This includes an overview of the proposed interventions ("big ideas") and growth inhibiting factors that were identified during the stakeholder engagements. A demonstration of how the quantitative and qualitative components of the study can be synthesized is provided in Section 6 as a number of case studies. The report concludes with Section 7 in which a short overview of the findings and recommendations is provided.

2. PROVINCIAL OVERVIEW

2.1 Unlocking latent growth potential

2.1.1 Introduction

Growth of a settlement or region is often driven by investments by the public and private sector. There are a number of ways in which an investment or project can be deemed to be viable. A project can be viable in a political sense. The viability of a project can be assessed in terms of its environmental consequences. There is naturally always a concern about the fiscal viability of a project. There is also emphasis on social viability.

In this section the focus is on the 'economic viability' of any potential project. The main task is to develop a conceptual framework for the understanding and application of economic viability.

2.1.2 Prior conditions and economic viability

It is a commonly held view that prior conditions should determine the prioritisation of public investment and infrastructure spending. Arguments are made in favour of investing in rural areas, or urban areas, or areas with high unemployment, or areas that are lagging behind, or areas with little commercial activity, or areas with large populations, or any other type of

area for which an argument can be made that the prior conditions of that area justify giving it priority.

However, the position advanced here as the principle upon which viability must be based is that from an economic point of view the most important criterion, if not the only criterion, should be the contribution of a project to overall economic development, i.e. job creation and increased production. The rationale for this argument is that the project that is economically most viable is also likely to be the one that will make the greatest contribution to the betterment of society. It is suggested, therefore, that policies that are based on giving priority to an area because of its prior condition, e.g. because it is rural, or because it has high unemployment, are misplaced and perhaps even misguided.

It is critical to make a clear distinction between social services and the promotion of and support for economic development. Social services spending must be guided by precisely that which is rejected for economic development spending. Social spending must be informed by prior conditions. Education must be provided where there are more children. Clinics must be built where there are more people in need of health services. Poverty relief efforts like public works programmes must be channelled to where there are the most unemployed people. Much confusion and poorly directed public spending arise from a failure to distinguish between the criteria that should apply to social spending and the criteria that should apply to the investment in economic development.

2.1.3 How regions grow

In a study by the Organisation for Economic Co-operation and Development (OECD) (OECD 2009) titled "How regions grow: Trends and analysis" a conclusion is reported that must be interpreted correctly, otherwise it could lead to confusion and policy misalignment. From an assessment of the main determinants of regional growth, the OECD (2009: 70) study argues that in order to promote regional growth "policy-makers should develop a comprehensive regional policy that not only links regions through infrastructure investments, but that also fosters human capital formation and facilitates the process of innovation." The analysis through which the study arrived at this view is instructive and relevant to the Western Cape.

From an econometric analysis the study arrives at the finding that infrastructure does not affect regional growth by itself. Infrastructure is only significant in the presence of human capital and innovation (OECD 2009: 83). Using the example of road infrastructure the report cautions that if human capital and innovation are not present in a peripheral region the new road access can generate competition that may lead to local firms closing or the transfer of production to the core regions. It could result in leakage, rather than economic development.

The finding that infrastructure only influences regional growth in conjunction with human capital and innovation, is obtained from both cross-section and panel data studies. In the words of the report "infrastructure is a necessary, but not sufficient, condition for growth" (OECD 2009: 87). This point is critical to the correct understanding of the OECD conclusion that "opportunities for growth exist in all regions and national governments should promote

growth accordingly" (OECD 2009: 17). It will be wrong, in the light of the foregoing, if this is interpreted that it does not matter in which regions infrastructure spending takes place as it will have the same effect on economic development regardless of the region it is spent in. The very next sentence in the OECD (2009: 17) report belies such an interpretation: "Greater growth occurs when regions are able to mobilise their own local assets and resources, rather than depending on support from the national government."

The OECD report makes it clear, as substantiated by its extensive empirical analysis, that infrastructure spending will not result in economic development unless the human capital and innovation prerequisites are present. In that sense, and certainly when constrained by scarce resources, economic development spending should be prioritised in terms of the economic viability of the projects to be funded.

2.1.4 Incentives and economic development

Related to the ability to "mobilise their own local assets and resources" is the set of incentives that direct and shape the decisions that people make. If in some sense the human capital is present in a region, or if the potential for innovation is present but latent in a region, it can still only be unlocked if economic agents have an appropriate set of incentives to direct their decisions.

Due to the writings of economists like Romer (1994) and North (1991) there is now a general acceptance of the importance of institutions in determining the economic well-being of societies. Institutions really mean the 'rules of the game', i.e. the incentive structures that mediate the decisions people make.

If a society (at the local, regional or national level) admires individuals who are economically successful, for example, it is more likely that such a society has the social and moral incentives that will promote the innovation that is essential for economic development. In contrast, in a society where equality and conformity are the dominant social values the incentive structures will tend to undermine or prevent innovation from occurring. Continued underdevelopment is then the more likely outcome, unless innovative capacity is imported or attracted from outside that society.

Incentive structures are also in operation in government and other public sector organisations (e.g. Burgess and Metcalfe (1999)). Incentive structures need not only be in the form of remunerative or financial rewards, but can also involve moral or coercive incentives. If public sector organisations are assigned a key role in promoting economic development it is essential that the incentive structures are supportive of that assigned role. Otherwise, resources are likely to be wasted and the desired economic development not achieved.

Of relevance to economic development are not only incentives that apply to individual actors, but also incentives that apply to organisations as a whole, including governments and politically-driven decision-making bodies. For example, if a local level organisation sees its main role as channelling subsidies from central government, it is unlikely to be an effective agent in the promotion of economic development. Other organisation level types

of incentives that have been written about include public recognition, removal of constraints, and delegation of authority, challenging projects, team-based awards, and allocation of discretionary funds.

In an OECD study two key lessons were drawn from a cross-country survey that may override any incentive structure and greatly determine the performance of public organisations:

- “Selecting the right staff in the first place is an absolute precondition for subsequent performance.”
- “Practitioners noted that the single largest driver of performance within the public sector is the retention of skilled and competent staff” (Ketelaar, Manning & Turkisch 2007: 27).

It follows that having the right people in public organisations may go a long way towards internalising the kind of organisation level incentive structure that can make such organisations effective agents in promoting economic development. This suggests that a measure of the human capacity of a governmental organisation may serve as a proxy for the presence of incentive structures that are conducive to the promotion of economic development.

2.1.5 Case study: Civil service of Brazil

In a case study of Brazil's federal civil servants, (Shepherd 2003: 22) concludes that their relatively good performance is the outcome of both public policies and external conditions. The following factors are specified:

- “The *human-resource policies* are strong on promoting merit-based appointments.”
- “*Organizational policies* have not obviously contributed to good performance. ... But certain ministries and agencies have ... created local cultures that have promoted accountability and incentives. Organizational incentives and cultures matter to employee performance.”
- “Brazil has a dynamic *labour market* for skilled people, as well as a developed system of tertiary education.”
- “*Political conditions* determine the relative demand in a country for patronage employment in the civil service versus professionalism. ... Since the return to democracy in the mid-1980s there is some “soft” evidence of the increasing importance of popular demand for honest and effective civil servants.”

While there are analysts who do not regard the relatively good performance of Brazil's federal public service as applicable to all or even most sub-national governments, there are some case studies of successes in some specific state or city governments. Matzuda, Rinne, Shepherd and Wenceslau (2008: 4) conclude, on the basis of two case studies, one of Sao Paulo state and the other of Curitiba city, that it is possible to have an effective sub-national government in the sense of aligning the incentives of staff with the government's broader policy objectives. Every public sector structure at each sub-national level of government must be independently assessed as to its incentive structures and how they facilitate that organisation's capacity to act as an agent for the promotion of economic development.

2.1.6 Case study: Civil service of China

A study of incentives in China's education system and its effect on teacher performance found what the theory would have led one to expect. Karachiwalla (2010: 29) found that promotion incentives do elicit effort in rural schools in China. Promotion is based on evaluation scores in which performance weighs heavily. The author found that when a teacher becomes eligible for promotion, he/she exhibits higher effort in the form of higher evaluation scores.

Echoing the findings of Karachiwalla (2010) a study by Xiaoqi (2006: 276) concludes that: "Despite the tremendous pressures induced by the continual reforms and decentralization, the central leadership has achieved a reasonably high degree of cohesion among cadres by designing effective mechanisms of elite recruitment, promotion and rotation, etc. ... And more importantly, citizens agree that local government performance improved after reforms and they feel satisfied with local governments' performance in our survey."

However, as can be expected, the nature of incentives and its effect on performance is not the same across China. Burns and Xiaoqi (2010: 77) conclude from their study of three cities that civil service reform across a vast country like China is unlikely to be a uniform or problem-free exercise. Xiaoqi (2006: 277) underscores this cautionary note by pointing out that government performance varies across different policy areas and across various bureaus. He nevertheless "finds the following characteristics of local bureaus are crucial in achieving great performance improvement: more financial resources and more committed local leaders to support the reform implementation; and effective leadership that can design and implement countermeasures to mitigate the newly-emerged principal-agent problems during the implementation process."

These views, repeated in many other studies, affirm the lesson drawn from the Brazil case study. Each public organisation in each location must be independently assessed as to the effectiveness of its incentive structure when it comes to the implementation of development policies.

2.1.7 A framework for assessing economic viability

The discussion in the preceding sections had the objective of laying a conceptual foundation for a framework that can guide the assessment of the viability of development projects in regions and settlements.

It needs to be emphasised that economic viability is not necessarily the only or even most important criterion according to which any particular project should be assessed. However, where a project is promoted on the basis of its contribution to economic development, it should be assessed in terms of its economic viability as defined here. As noted in Section 2.1.2, a clear distinction should be drawn between projects aimed at promoting economic development and social service projects. The latter does not have to, and rarely will be, economically viable.

The conceptual framework for the assessment of economic viability of projects is outlined as follows:

- The economic viability is defined in terms of its contribution to economic development.
- Economic development is measured as the extent of direct and indirect job creation and increased production.
- The jobs created and increased production must be sustainable without continued subsidisation which means that it must be private sector or market based.
- Prior existing conditions should not be the basis for prioritising economic development projects and the sole criterion should be economic viability.
- Economic development, i.e. job creation and increased production, as a result of infrastructure spending or other economic development spending, is only likely in a settlement or region if it has or can attract the pre-requisite human capital and innovation.
- An essential ingredient in both the required human capital and the potential for innovation is the incentive structures embedded in the institutions that shape how the people and organisations in a region or town will respond to the 'opening up' of the region due to infrastructure or other development spending.
- In addition to appropriate incentive structures it is also of critical importance that civic leadership and civil servants are of the right quality as a public sector project will not be economically viable if the key role players do not have the required competence and social commitment.
- The support given to local governments by a provincial or central government should be dependent on whether a local government has got the capacity and the resources, i.e. the human capital and the incentive structures that generate innovation, to transform such support into economic development.

The assessment methodology that emanates from this framework can consist of steps along the lines suggested in Table 1 (read from the left). The economic viability of each project must be assessed by estimating or evaluating each of the items in the following columns. The first question that must be answered in the affirmative is whether a proposal under consideration is a project that requires provincial support or funding. The linkage or spin-off effects on employment and production in neighbouring areas or the core town or region must also be estimated, although the rest of the information is required only for the town or region of direct impact.

Table 1 Assessment framework

Is the proposal a project that requires provincial support or funding?	Region or spatial category of immediate impact	Estimate direct sustainable employment creation.	Are the incentive structures in local institutions conducive to the innovation that will be required as a result of the project?	Must be positive.
		Estimate direct sustainable increase in production.	Does the required human capital exist in this spatial category or can it be attracted to it?	Must be positive.
			Does the region or town have the required leadership and quality of civil servants (human capacity)?	Must be positive.
	Neighbouring spatial categories or core that will experience linkage effects	Estimate indirect sustainable employment creation.		Must not be negative.
		Estimate indirect sustainable increase in production.		Must not be negative.

If the net job creation is positive and if net production will increase if a project is implemented, it would have passed the first quantitative test for economic viability. If the assessment of the three more qualitative questions about the incentive structures and institutions, the human capital, and the leadership and quality of civil servants (if applicable) is also positive then a project is deemed to be economically viable. If there is a budget constraint in terms of how many projects can be supported, then the viable projects can be ranked with respect to the extent of job creation and increased production. Finally, other considerations can then be brought to bear on the list of viable projects. These considerations could include any of the following: environmental concerns, social objectives, fiscal considerations, strategic investments or technology sector goals, or issues about fairness or social cohesion.

2.1.8 Focus on projects

Implicit throughout this section was the assumption that economic viability as a concept is only applicable to 'projects' and not to 'programmes'. Again, this is not about spending on social services, but only about infrastructure spending or specific projects intended to promote economic development.

A project implies a clearly defined deliverable and time-frame, a specified budget, an implementing agent that is accountable for the delivery of the project, and the quantification of the impact of the project.

There are projects, especially certain types of infrastructure projects, for which it might be difficult to estimate the sustainable direct and indirect job creation and increased production, or at least difficult to do so with any degree of accuracy. In such cases a greater weight might have to be given to the three qualitative assessment questions in determining the economic viability of a project.

An important implication of this focus on projects is that every project must be assessed on its own merits. If project X was found to be economically viable for town A or region B, then it does not follow that all other projects for town A or region B will also be economically viable. In other words, it will be wrong to classify a specific town or region as 'always economically viable' or 'never economically viable'. If a project is found to be economically viable then, in principle, it could be supported regardless of the prior conditions existing in that town or region.

2.2 Provincial and national policy

2.2.1 Introduction

In South Africa, there is a growing recognition of the importance of a new regionalist planning agenda and the value it can add to creating an effective intergovernmental planning system. The strength of such an approach lies in the role of provincial planning, often considered to be the weak link within the intergovernmental planning system in South Africa. The state has introduced a three-tiered system of integrated planning aimed at ensuring intergovernmental priority setting, resource allocation, implementation, and monitoring and evaluation to achieve sustainable development and service delivery (Makoni, Meikeljohn & Coetzee 2008). The indicative and normative planning instruments which constitute this system include at national level the National Development Plan (NDP) Vision 2030, the Medium-Term Strategic Framework (MTSF) and a proposed new National Spatial Framework (NSF) as suggested by the NDP to replace the National Spatial Development Perspective (NSDP). According to the NDP "the development of the national spatial framework needs to involve the government, business and civil society to create a shared perspective. In identifying key elements of a common vision, lessons can be learnt from an earlier attempt to address such concerns – the National Spatial Development Perspective. It focused on the tough choices facing costly public investments, but it took a narrow view of the development potential of different places (National Planning Commission 2012: 278). At provincial level these instruments include the Provincial Growth and Development Strategies (PGDSs), supported by Provincial Spatial Development Frameworks (PSDFs); and at local level the municipal Integrated Development Plans (IDPs), which include Spatial Development Frameworks (SDFs).

2.2.2 National policy context

The NDP aims to eliminate poverty and reduce inequality by 2030. The National Planning Commission is an advisory body that was appointed by the President in May 2010 to draft a vision and national development plan. The initial work of the Commission was focussed on the preparation of a series of Diagnostic Reports, released during 2011 and set out South Africa's achievements and shortcomings since 1994. It identified a failure to implement policies and an absence of broad partnerships as the main reasons for slow progress, and set out nine primary challenges. The Commission consulted widely on the draft plan and the final National Development Plan was released during 2012. In essence the plan aims to eliminate income poverty by reducing the proportion of households with a monthly income below R419 per person (in 2009 prices) from 39 per cent to zero and reduce inequality as measured by the Gini coefficient from 0.69 to 0.60. To achieve these goals the NDP identified ten critical actions for implementation (National Planning Commission 2012: 24):

- A social compact to reduce poverty and inequality, and raise employment and investment.
- A strategy to address poverty and its impacts by broadening access to employment, strengthening the social wage, improving public transport and raising rural incomes.
- Steps by the state to professionalise the public service, strengthen accountability, improve coordination and prosecute corruption.
- Boost private investment in labour-intensive areas, competitiveness and exports, with adjustments to lower the risk of hiring younger workers.
- An education accountability chain, with lines of responsibility from state to classroom.
- Phase in national health insurance, with a focus on upgrading public health facilities, producing more health professionals and reducing the relative cost of private health care.
- Public infrastructure investment at 10 per cent of gross domestic product (GDP), financed through tariffs, public-private partnerships, taxes and loans and focused on transport, energy and water.
- Interventions to ensure environmental sustainability and resilience to future shocks.
- New spatial norms and standards – densifying cities, improving transport, locating jobs where people live, upgrading informal settlements and fixing housing market gaps.
- Reduce crime by strengthening criminal justice and improving community environments.

The NDP calls for a new NSF as a spatial policy that seeks to coordinate and connect the principal decisions that create and shape places to improve how they function. The NSF is not seen as addressing the details required within provincial and municipal spatial development frameworks, but providing broad principles for provincial and local development. It provides the following normative principles for spatial development (National Planning Commission 2012: 277):

- Spatial justice: The historic policy of confining particular groups to limited space, as in ghettoization and segregation, and the unfair allocation of public resources

between areas, must be reversed to ensure that the needs of the poor are addressed first rather than last.

- Spatial sustainability: Sustainable patterns of consumption and production should be supported, and ways of living promoted that do not damage the natural environment.
- Spatial resilience: Vulnerability to environmental degradation, resource scarcity and climatic shocks must be reduced. Ecological systems should be protected and replenished.
- Spatial quality: The aesthetic and functional features of housing and the built environment need to be improved to create liveable, vibrant and valued places that allow for access and inclusion of people with disabilities.
- Spatial efficiency: Productive activity and jobs should be supported, and burdens on business minimised. Efficient commuting patterns and circulation of goods and services should be encouraged, with regulatory procedures that do not impose unnecessary costs on development.

The overall goal of the Cities Support Programme (CSP) is to link direct technical assistance to fiscal and organisational incentives for improved city performance, with a specific focus on restructuring the system of intergovernmental grants to reward performance and encourage the collection of own revenues by cities (National Treasury 2012). The objective is to support the spatial transformation of South African cities to create more inclusive, productive and sustainable urban built environments, primarily by enabling larger, more capable municipalities to respond to the implementation support needs of cities in four critical areas of the built environment: governance and planning, human settlements management, public transport and climate resilience. This support is provided through technical assistance linked to incentives that are designed to strengthen municipal capacity and performance. The core components of the programme are structured around existing or emerging programmes of government, including transversal support programmes such as the Local Government Municipal Finance Management Act (MFMA) implementation support programme, specific human settlements programmes such as the Urban Settlements Development Grant and the National Upgrading Support Programme (NUSP), and public transport programmes such as the Public Transport Infrastructure and Systems Grant (PTISG) and the Public Transport Operations Grant (PTOG) (National Treasury 2012: 11). This programme is of specific relevance to three non-metropolitan municipalities in the Western Cape with the George local municipality identified for participation in Phase 2 of the programme, and the Drakenstein and Stellenbosch municipalities in Phase 3.

The draft National Urban Development Framework (NUDF) (Republic of South Africa 2009) provides a common national view on how to strengthen the capacity of South Africa's towns, cities and city-regions to realise their potential to support national shared growth, social equity and environmental sustainability. The NUDF recognises that South Africa's settlement structure is more complex than what a single "urban" category allows for. Different kinds of places present distinct challenges for policy and require different responses. And the NUDF thus proposes an urban settlement typology comprising of city-regions, cities, regional service centres, service towns, and local and niche settlements. The NUDF identified a number of important policy implications from the national spatial trends analysis and the typology. These include:

- The pattern of urbanisation combined with growing service backlogs in the major urban growth nodes points to the need for better forward planning and management of urban growth at national, provincial and local sphere.
- The strong regional interdependencies and flows between “urban and urban” and “urban and rural” areas suggest the need for a more integrated approach to economic and settlement planning at multi-jurisdictional regional level to improve linkages and synergies.
- The typology points to the need for a differentiated governmental approach to settlement support given the wide diversity of settlements types with very different needs and capacities.
- The data suggests that there is a national need to prioritise institutional, service delivery and economic development support to two categories of settlement type in particular:
 - The high-growth cities and city-regions whose rapidly growing populations, concentrated poverty and service delivery backlogs combined with their relatively high economic growth rates point to them as areas of strategic importance.
 - The high-density settlement areas of the former homelands with large and growing populations but little economic activity and high rates of poverty. In this regard, it is noted that critical attention should be paid to the relatively underdeveloped Regional Service Centres serving such areas with a view to improving urban management and connectivity as a key element of any rural development approach are linked to such areas.
 - The need for concerted national action to manage environmental risk flowing from the growing natural resource pressures experienced by the major cities and the high-density settlement areas in particular.

At a more local level, Cabinet approved its Local Government Turnaround Strategy (LGTAS) in December 2009. The strategy is underpinned by two important considerations because each municipality faces its own challenges and has its own dynamics. Consequently, a “one-size-fits-all” approach to municipalities would not be useful or acceptable. The twin over-arching aim of the Turnaround Strategy is to: (1) restore the confidence of people in local municipalities as the primary delivery machine of the developmental state at a local level; and (2) rebuild and improve the basic requirements for a functional, responsive, accountable, effective and efficient developmental local government. Two of the five strategic objectives of the LGTAS aim to improve national and provincial policy, support and oversight to local government, and to strengthen partnerships between local government, communities and civil society to ensure that communities and other development partners are mobilised to partner with municipalities in service delivery and development.

The Regional Industrial Development Strategy (RIDS) suggests the creation of a Thematic Fund to support innovative regional development initiatives (Department of Trade and Industry 2005:12). According to (Atkinson 2008:23) –

“... this holds some hope for small towns in regions which can identify a specific niche product or service. But, as yet, this interesting regional approach is aimed at industry, and not at agriculture or the service sector. Whether small enterprises in outlying towns are ever likely to become part of a government export scheme

appears unrealistic, at this stage. For example, interviews conducted in the Western Cape suggest that WESGRO's focus remains predominantly on high-tech sectors found in the coastal areas. There is an urgent need for a meaningful regional strategy, which can delimit regions according to their economic characteristics and potential, and not according to artificial government jurisdictions."

There are other indications that government wishes to extend its business support system to small and medium-sized towns. One is that government wants to create comparable support services in urban/metropolitan and rural areas (Atkinson 2008:21). The DTI's spatial dimension of its business support strategy is aimed at special geographic areas (poor areas with high unemployment) (Department of Trade and Industry 2005:25). In addition, the DTI's strategy aims to stimulate delivery points in specific localities:

At the local level, steps will be taken to co-locate as many small enterprise support agencies as possible, in order to create integrated access points for aspiring and existing entrepreneurs. Special efforts will be made to integrate local municipality and business support initiatives into these access points.

Government's main instrument to provide business support is the SEDA (Small Enterprise Development Agencies) system. However, at present, SEDA offices are only concentrated in the provincial capitals and the main towns, and do not reach the outlying towns. It is hoped that these will gradually decentralise to somewhat smaller towns, usually one or two per district municipality, from where they will provide an outreach service to small towns (Atkinson 2008:22). According to Atkinson (2008), the Implementation Agents (IAs) to be appointed for the outlying small towns, appear to have had some difficulty in finding appropriately skilled and experienced businesses to act as IAs. She concludes by arguing that it "may well be the case that the most important role of the SEDAs would be to assist private investors and government departments or municipalities to outsource effectively to second-economy entrepreneurs".

In line with the above policy directive and shift towards investment in rural areas, the Comprehensive Rural Development Programme. Great emphasis is placed on rural development in three spheres: (1) economic, (2) social, and (3) public amenities and facilities. The challenges include the revitalising, revamping and creation of new economic, social and information communication infrastructure, as well as public amenities and facilities in villages and small rural towns. Among some of the challenges are the "revitalisation and revamping of old, and the creation of new economic, social and information communication infrastructure and public amenities and facilities in villages and small rural towns" (Ministry of Rural Development and Land Reform 2009:3). In the same vein, the White Paper on Ministry of Rural Development and Land Reform (2009) claims that land reform can make a major contribution towards addressing unemployment, particularly in rural areas and small towns.

2.2.3 Provincial policy context

The draft new Western Cape Provincial Spatial Development Framework (PSDF) of 2013 classified the spatial challenges facing the province as legacy challenges, current

challenges, and future risk challenges (Western Cape Government 2013e). The critical remaining legacy challenges include urban settlement patterns characterised by low density dormitory townships usually lacking the normal range of economic and social facilities resulting in inequitable working and living patterns. The PSDF recognises that these patterns are still prevalent after nearly two decades of a democratic era. The primary current urban challenge is identified as transforming apartheid era dormitory townships into integrated and sustainable human settlements, as well as accommodating urban growth more efficiently and equitably. From a rural perspective, the most pressing current challenges include the sustainability of many of the province's small towns in view of their narrow and vulnerable economic base and, in some instances, remote location off the province's infrastructure networks. The future risk challenges to the provincial space-economy that require mitigation or adaptation responses from a spatial planning perspective include (Western Cape Government 2013e: 19):

- climate change and its impact on the province's eco-system services, economic activities (particularly agricultural production), and sea level rise associated with extreme climatic events;
- energy insecurity and high levels of carbon emissions, given an energy intensive provincial economy and spatial patterns that generate high levels of travel;
- water quality and quantity deficits;
- exclusionary land markets and the continued reality of urban informality;
- food insecurity; and the
- sustainability of municipal finances.

The Western Cape's iKapa Elihlumayo Growth and Development Strategy (2008) was built on twelve iKapa strategies of which the PSDF, the Strategic Infrastructure Plan and Micro-Economic Development Strategies were the key spatially-related policies. iKapa was contextualised within the national imperatives.² iKapa (2008:39) is also very clear on its spatial investment focus:

Public investment funds are always limited, which implies the need for prioritisation. The iKapa GDS therefore responds to the NSDP through the focus of infrastructure investment in areas with high poverty levels and high growth potential. Such investment is designed to unlock economic potential through the removal of the binding constraints that block development. This is particularly relevant to investment in transport systems and infrastructure. Areas with significant poverty challenges and limited economic growth potential not prioritized for public-sector infrastructure investment therefore require investment in social and human capital.

The Economic Development Partnership (EDP) was mandated by the WCG to develop a long-term economic vision for the province for the next 30 to 40 years. The outcome represents a deliberate attempt to stimulate a transition towards a more inclusive, resilient

² According to the National Spatial Development Perspective, Vision 2014, the Millennium Development Goals (MDGs), the Medium-Term Strategic Framework (MTSF), the Accelerated and Shared Growth Initiative for South Africa (ASGISA), the National Industrial Policy Framework (NIPF), the National Framework for Local Economic Development (NFLED), the National Framework for Sustainable Development (NFSD) and the anti-poverty strategy.

and competitive regional economy around a common agenda based on six transitions: These transitions include Knowledge (Educated Cape), Economy (Enterprising Cape), Ecological (Green Cape), Connectivity (Connected Cape), Settlement (Living Cape) and Institutional (Leading Cape). The Western Cape Infrastructure Framework (Western Cape Government 2013d) is aligned with OneCape 2040 and sets out the required changes and development agendas relating to infrastructure provision to optimally achieve the OneCape 2040 transitions, including a quantification of the scale and nature of the infrastructure requirements in the province.

The overall aim of the Western Cape Green Economy Strategy Framework is to achieve the double dividend of optimising green economic opportunities and enhancing environmental performance. The core ambition of the framework is defined as "To position the Western Cape as the lowest carbon province in South Africa and the leading green economic hub of the African continent" (Western Cape Government 2013a: 8). The framework is premised on five key principles that drive the areas of focus and choices of action:

- Market focus: Green economic action needs to be based on market dynamics and strong potential market demand from the local to the global sphere.
- Private sector-driven: Investment to support green growth needs to be driven primarily by private enterprise and in particular by entrepreneurial businesses with the foresight and risk appetite for new economic endeavours.
- Public Sector-enabled: The principal value of public entities is to enable the green economy. Through procurement, they can create an important market and in doing so, provide both political and economic leadership through example.
- Collaboration: Innovation and market expansion require new forms of collaboration and partnering as greater uncertainty and complexity emerge in the economic, social and environmental nexus.
- Inclusion: Resource and climate change challenges threaten economic exclusion. Inclusion needs to be integral to growth.

The purpose of the Province of the Western Cape's (2007) Sustainable Human Settlement Strategy (ISIDIMA) is to ensure that human settlement interventions achieve the goal to create an environment that allows the citizens and residents of the Western Cape to engage constructively with the state to access a wide range of services, facilities and benefits that can satisfy their fundamental human needs without degrading the ecosystems they depend on. The policy context to achieve this aim is based on the following (Western Cape Government 2007:44):

1. Provincial Growth and Development Strategy: given that growth targets will be undermined by dysfunctional urban economies, sustainable human settlements will promote integration and greater coherence within and across localities;
2. Provincial Spatial Development Framework: coherent spatial planning targets and sustainable resource use can only be achieved if housing delivery systems serve to dismantle rather than reinforce apartheid spatial forms;
3. Social Capital Formation Strategy: housing is central to participation-based social capital formation;

4. Strategic Infrastructure Plan: provides a framework that can reinforce sustainable human settlements via various subsidies, densification and a sustainable resource use perspective that substantially increases efficiencies;
5. Micro-Economic Development Strategy: a wider integration of housing delivery into market dynamics that support entrepreneurs makes housing a key element of local economic development;
6. Integrated Transport Plan: which makes it clear that a shift to public transportation is key, thus complementing the emphasis in the WCSHSS on access and compactness; and
7. Sustainable Development Implementation Plan: compact human settlements that are configured to reduce resource use significantly in order to contribute significantly to the achievement of the goals and objectives of the SDIP.

Insofar as the release of strategic parcels of state-owned land is concerned, the Province of the Western Cape's (2007) ISIDIMA acknowledges that, although there have been some attempts to use well-located state-owned land for restructuring the apartheid patterns of South African cities and towns, there are still significant parcels of well-located vacant or underused state-owned land. Objective six of ISIDIMA states that state land and other resources should be used for spatial restructuring, with direct and indirect benefits for the poor.

2.3 Development priorities from a municipal perspective

The national and provincial policy framework has to be contextualised within planning and prioritisation processes taking place at municipal sphere. Integrated Development Plans (IDPs) are the primary planning and development instruments in the South African planning system and play a central role in integrating the planning and development intentions of all three spheres of government. These plans are thus intended to integrate the development priorities and proposed interventions emanating from various detailed supporting sector plans (such as LED plans, Housing Chapters, Integrated Transport Plans) and to reflect the development intentions of all three spheres of government. The importance of functional relationships between settlements is also evident in the growing recognition of the importance of a new regionalist planning agenda in South Africa and the value it can add to creating an effective intergovernmental planning system. During the initial stages of the project a modelling process was undertaken to identify potential functional regions within the province that could be used to inform the qualitative analysis procedures and stakeholder consultation process. The inter-relationships between settlements was analysed using the Intramax model available in FlowMap. The approach published by Nel, Krygsman & de Jong (2008) was adopted to generate clusters of towns (also called functional regions). The main source of flow data was be the journey-to-work data available in the 2001 South African Census, using main places as mapping unit. The end result of the Intramax model is a dendrogram grouping towns with strong inter-relationships. This process resulted in the demarcation of nine functional regions (Figure 1) in the province. These functional regions were then used to structure the analysis of the municipal IDP documents.

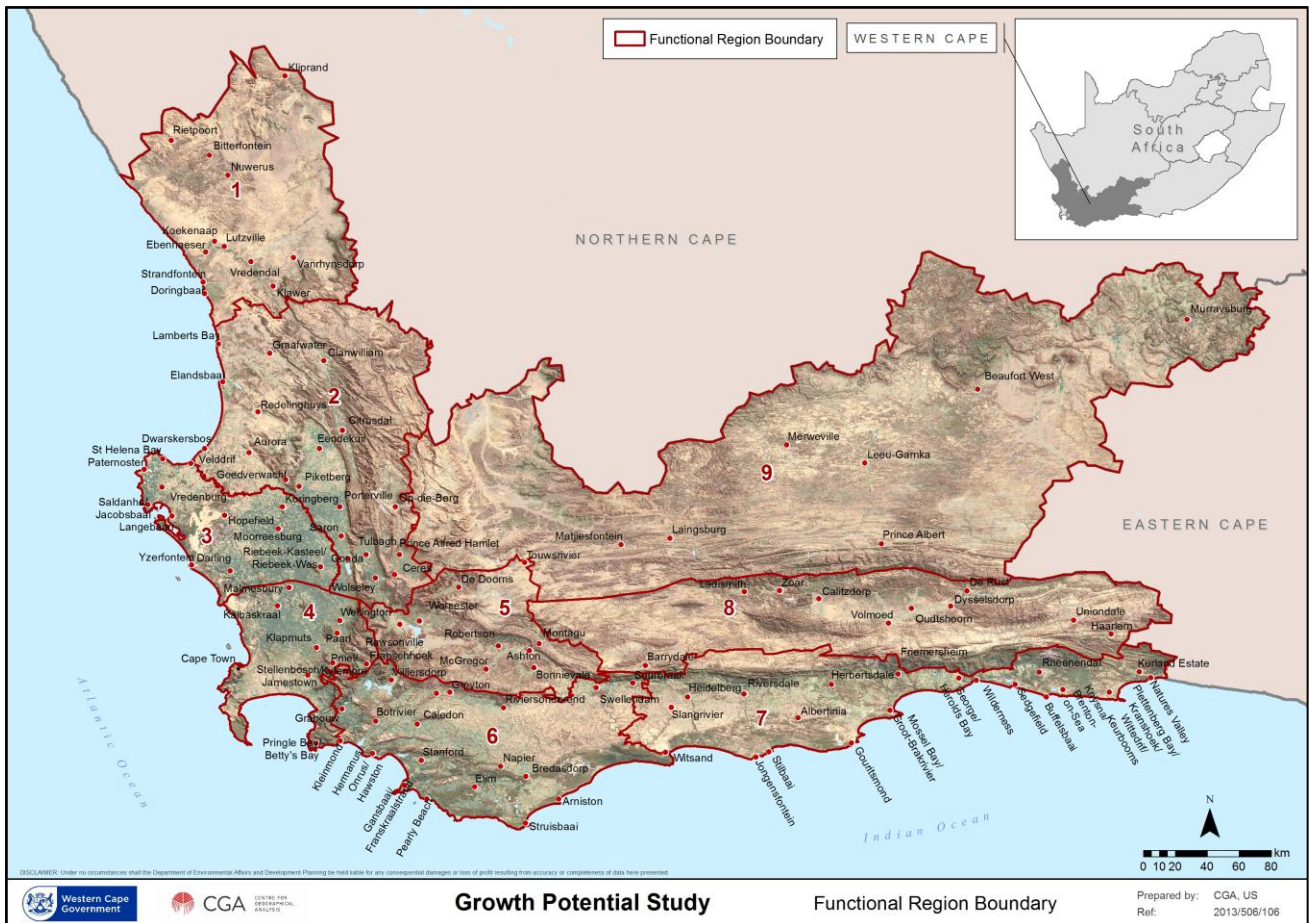


Figure 1 Nine functional regions used to structure the analysis of municipal IDP documents

For the purposes of obtaining a composite view of development priorities at municipal sphere as expressed through the integrated development planning process, the latest approved IDPs of municipalities (2011/12 revisions at the time of analysis) was scrutinised. The purpose was to produce a matrix-based summary (summarised according to the identified nine functional regions) of the development priorities identified by the various local and district municipalities within the province. The results of this process are depicted in Table 2.

Table 2 Provincial wide summary of IDP development priorities (level 1 and 2 priorities)

#	Priority	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6	Reg 7	Reg 8	Reg 9
1	Optimal basic service delivery/effective infrastructure development and maintenance/sustainable service provision	●	●	●		●	●	●	●	●
2	Economic development and employment creation		●	●	●	●	●	●	●	●
3	Efficient governance and accountable administration	●	●	●			●			●
4	Safe and healthy living environment		●		●	●				●
5	Human resource and skills development						●	●	●	
6	Efficient management of the natural environment/biodiversity conservation		●		●					
7	Municipal transformation and organisational development	●						●		
8	Poverty alleviation			●						●
9	Sound municipal financial management					●				
10	Housing provision/address housing backlogs/create sustainable integrated human settlements					●			●	
11	Improved quality of life			●						
12	Promotion of tourism development			●						

These results provide a simplified and condensed overview of municipal level development priorities within the province based on the outcomes of the IDP process. The provision and maintenance of infrastructure and economic development and employment creation are clearly the development priorities of most municipalities within the province and was identified as one of the two top priorities in the majority of the sub- regions. At a second tier the provision of efficient and accountable governance, providing safe and healthy living environments, and human resource and skills development were further identified as top priorities in four or five of the functional regions. Other development priorities common to municipalities of at least two of the functional regions is summarised in Table 2. These priorities provide some indication of the municipal views on critical interventions required in different part of the province and forms an important framework for interpreting the quantitative analysis results presented in the subsequent sections.

3. QUANTITATIVE ANALYSIS

3.1 Introduction

As explained in Section 1.2, a comprehensive quantitative analysis was not in the original scope of the GPS2013. However, the need for such an analysis arose from the availability of updated (2011) census data. This section explains how the census data and other spatial information was used to quantitatively model growth potential and socio-economic needs.

Raw data is seldom meaningful to the general public and decision-makers, and the meaning from the data only emerges through analysis. The value of data for conveying information to various stakeholders widens and becomes increasingly powerful as the data is condensed. Through the application of various forms of analysis and techniques, primary data can be transformed into indicators that reduce complexity and also bring clarity to decision processes. At the apex of this hierarchy, an index can be described as a higher-order indicator which acts as an aggregated or weighted set of combined indicators. Shields et al. (2002) emphasise the importance of indices as having significance in the sense of extending the value of indicators beyond that directly associated with the original measured property of information.

This hierarchy also holds implications for the eventual use of the information emanating from the various levels within this hierarchical structure. As suggested by Shields et al. (2002:158), the key challenge is to provide the most meaningful information to the intended audience. This implies that the appropriate level of condensation of information is a function of the audience of the intended data. This relationship between the total quantity of information and the requirements of the various audiences is graphically depicted in Figure 2. According to Meth (2008), the use of this information usually lies between the two extremes of statistical users at the one end, having as their main focus the information results, and policy makers at the other end of the scale, who need to respond to presented information in the form of formulation, implementation and amendment of policies.

Modelling the growth potential of towns is a complex process that involves multiple factors that are often interrelated and spatial in nature. Geographical information systems (GISs) are ideal to capture, store, manipulate, analyse and communicate spatial information (DeMers 2009). Although many methods exist whereby GISs can be used to analyse multiple factors (Chang 2006), a multi-criteria evaluation (MCE) approach was used in this study. Due to its ability to divide complex problems into smaller understandable parts that are then evaluated independently (Malczewski 1999), MCE has been used in many types of applications including economics (Al-Najjar & Alsyouf 2003), noise pollution (Van der Merwe & Von Holdt 2006), forestry (Varma, Ferguson & Wild 2000; Bruno, Follador, Paegelow, Renno & Villa 2006), conservation (Phua & Minowa 2005; Wood & Dragicevic 2007), flood vulnerability (Yalcin & Akyurek 2004), transportation (Vreeker, Nijkamp & Ter Welle 2002), tourism potential determining (Van der Merwe, Ferreira & Van Niekerk 2008), and land use suitability analysis (Van Niekerk 2008).

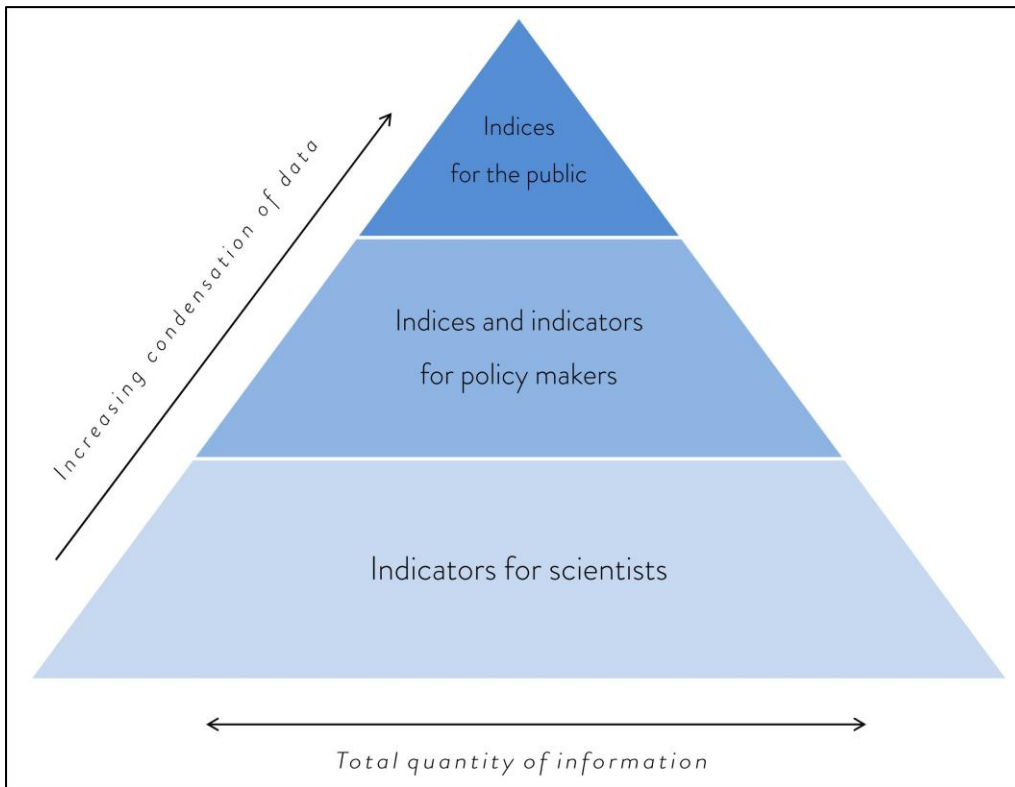


Figure 2 Relationship between data condensation and audience

3.2 Methods

3.2.1 Indicator identification and selection

A pragmatic approach was adopted to arrive at an acceptable set of indicators to be used in the quantification process. The first important task was to identify an appropriate organising framework for the development of indices and the collection of data for the underlying indicators/variables. This structuring framework was approached from both a quantitative and qualitative perspective.

A review of recently published literature that included general urban development research, statistical studies of economic conditions, and specific sectoral studies and policy directives was undertaken. The broad context of the new set of indicator groupings stems mainly from a combination of international indicator guidelines (United Nations Indicators of Sustainable Development) to national governmental policy-driven initiatives (e.g. National Development Plan 2030) and provincial policy (Table 3). It was also informed by the indicator grouping as applied in GPS2004 (Van der Merwe et al. 2004), and the feedback from a number of local municipalities and the project steering committee on the indicators used in GPS2010 (Van Niekerk et al. 2011).

Table 3 Policy framework guiding indicator identification

INTERNATIONAL	UNITED NATIONS INDICATORS OF SUSTAINABLE DEVELOPMENT	Poverty, governance, health, education, demographics, natural hazards, atmosphere, land, oceans, seas, coasts, freshwater, biodiversity, economic development, global economic partnership, consumption and production patterns.
NATIONAL	NATIONAL DEVELOPMENT PLAN 2030	Demographic trends, economy and employment, economy infrastructure, environmental sustainability, rural economy, transforming human settlements and the national space economy, improving education and training, promoting health, social protection, building safer communities, a capable and developmental state, fighting corruption, transforming society and positioning South Africa in the world.
	MTSF STRATEGIC PRIORITIES	Build a developmental state, including improving of public services and strengthening democratic institutions, improve the health profile of society, strengthen the skills and human resource base, a comprehensive rural development strategy linked to land and agrarian reform and food security, speed up economic growth and transform the economy to create decent work and sustainable livelihoods, massive programmes to build economic and social infrastructure, pursue regional development, African advancement and enhanced international cooperation, sustainable resource management and use, intensify the fight against crime and corruption, build cohesive, caring and sustainable communities.
	SA DEVELOPMENT INDICATOR CATEGORIES	Poverty and inequality, good governance, health, education, economic growth and transformation, employment, international relations, safety and security, household and community assets, social cohesion.
PROVINCIAL	IKAPA GROWTH AND DEVELOPMENT STRATEGY	Broadening of economic base and reduction of poverty, effective governance, enhancement of Human capital, broadening of economic base and reduction of poverty, sustainable resource use, effective public and non-motorised transport, efficient infrastructure, greater spatial integration, liveable communities/integrated human settlements, social transformation.

The resulting structuring framework (Table 4) consists of five main themes, namely human capital, economic, physical-environmental, infrastructural, and governance/institutional and are consistently present in many of the documentation studied. There is a striking similarity between the five identified themes and those used in the internationally recognised Environmental Sustainability Index: Social/Cultural, Economic, Environmental, Political, and Institutional/Technological. Infrastructure was identified as a stand-alone factor (even though it can be regarded as a cross-cutting factor), but the focus here was to apply infrastructure as the add-on fixed production factors to a physical space to enhance its development value and potential (Wong 2002). These indicators also cover the four main aspects of sustainable development in all the chapters of Agenda 21, therefore ensuring that the most significant aspects of sustainable development are monitored by the indicators.

Table 4 Structuring framework for indicator selection

#	THEME	SUB-THEMES	MODELLING PURPOSE
1	Economic	Extent and diversity of retail and services sector Tourism potential Economic size and growth Economic diversity Market potential Change in labour force Property market	Preconditions for Growth
2	Physical environment	Availability and quality of water Natural potential	
3	Infrastructure	Land availability and use Transport and communication Availability of municipal infrastructure	
4	Human Capital	Poverty and inequality Human resources Population structure and growth	Innovation Potential
5	Institutional	Quality of governance Safety and security Administrative and institutional function Availability of community and public institutions	

These themes were consequently used as main indices of growth potential and as a framework for indicator collection (Figure 3). Each index in turn consists of two or more categories, each including a number of indicators.

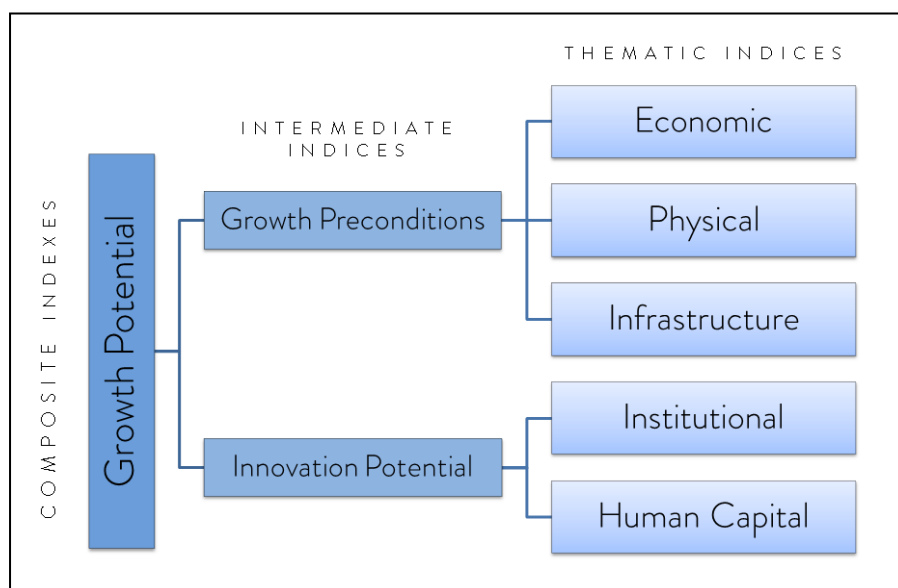


Figure 3 Growth Potential Index construction

A total of 85 potential indicators were subsequently identified according to this structuring framework. The basic criteria that were applied in the identification and selection of indicators appropriate to each category within this structuring framework included:

- simplicity – the final indicators had to be as simple as possible;
- robustness – an indicator had to be robust and statistically validated;
- responsive – an indicator had to be responsive to policy interventions but not subject to manipulation;

- scope – the indicators had to cover the whole spectrum of human and economic activities and bio-physical functions relating the subject matter (in this instance non-metropolitan towns in the Western Cape), while having minimal overlap with other indicators;
- quantification – the elements had to be readily measurable;
- assessment – the elements had to be capable of being monitored to establish performance trends;
- sensitivity – the chosen indicators had to be sensitive enough to reflect important changes in characteristics; and
- timeliness – frequency and coverage of the elements had to be sufficient to enable timely identification of the performance trends.

A complete list of indicators in the context of the structuring framework (Table 4) is included as Appendix A.

The analysis of growth potential must however also be framed within the context of the socio-economic needs within settlements and municipalities. A socio-economic needs index based on the methodology and criteria of a similar index developed by the Western Cape Department of Social Development (Miller 2013) at municipal and ward level was implemented at settlement level. This index is based on four thematic indices (i.e. *Household Services, Education Level, Housing Needs, and Economic Characteristics*). For a detailed explanation of this index, please consult Appendix B. Two variants of this index were developed for this purpose and based on both real values (number of households in need) and proportional values (proportion of households in need).

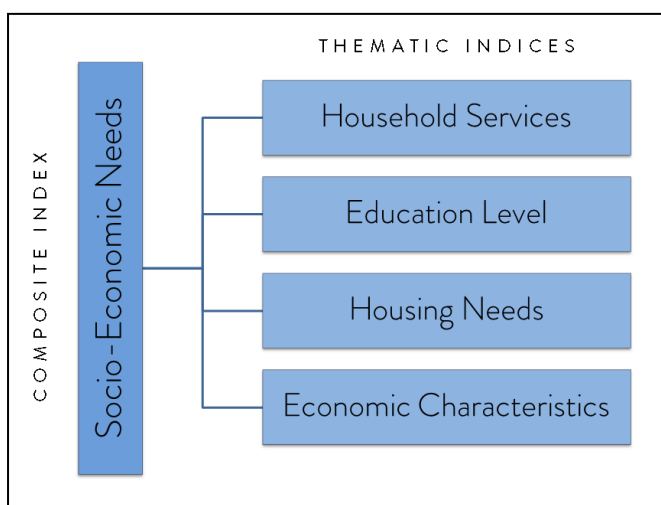


Figure 4 Socio-economic Index construction

3.2.2 Parameters of analysis

As explained in the previous section, the quantitative analysis for this report was carried out at both settlement and municipal levels. A total of 131 settlements (as defined in GPS2004) and all the Western Cape local municipalities apart from the Cape Town metropolitan area were included. However, during the data preparation and analysis phase it became clear that the physical and functional linkages between some of these towns necessitate an alternative approach to defining individual settlements, where clusters of towns/settlements should be regarded as single entities for the purposes of informing policy

development. Consequently, each individual town was considered within the context of its proximity to and physical linkages with its nearest adjacent towns. A combination of quantitative (e.g. population size, physical size and proximity) and qualitative (e.g. functional role) methods were used to identify settlements to be merged. Based on this approach the following towns were regarded as single entities for the purposes of data analysis:

- Betty's Bay & Pringle Bay;
- Gansbaai & Franskraalstrand;
- George & Herolds Bay;
- Hermanus, Onrus & Hawston;
- Knysna & Brenton-on-Sea;
- Mosselbaai, Groot Brakrivier & Klein Brakrivier;
- Plettenbergbaai & Keurboomsrivierstrand;
- Pniel & Kylemore;
- Riebeek-Kasteel & Riebeek-Wes;
- Saldanha & Jacobsbaai; and
- Stellenbosch & Jamestown.

An important point of departure prior to commencement of the quantitative analysis; was to define the appropriate parameters of analysis. Depending on the mapping scale, a town can be represented by a point (i.e. its centre) or a polygon (i.e. its urban edge). In addition, because a town is influenced by its surrounding hinterland activities, a town can also be defined as a Voronoi (Thiessen) polygon. The latter ensures that any point within the polygon is closest to its centre (i.e. town centre). Due to the nature of the data that was expected to influence the growth potential and human needs of towns, it was recognised that a combination of spatial entities (i.e. centre of town, urban edge and Thiessen polygon) had to be used to represent towns. For instance, to calculate a town's distance from major roads, the town had to be represented by its centroid (i.e. point). Thiessen polygons are preferred when the influence of the surrounding hinterland, for instance when relating its surrounding agricultural activities, needs to be calculated. Consequently, it was decided that the data would dictate the spatial entities used during data preparation, but that all polygons would be converted to points (i.e. centroids) to enable easier comparison of the different attributes.

For many regional planning and geography applications the capacity or functional extent of a settlement should be taken into account when generating Thiessen polygons. Dong (2008) and Gong, Li, Tian, Lin and Liu (2012) developed a methodology whereby the size and shape of a Thiessen polygon can be manipulated (weighted) according to an attribute of the source dataset (usually points). This approach was followed to generate the Thiessen polygons (see Figure 5) used in this project. The polygons were weighted according to the population sizes of the settlements in the Western Cape, thereby generating a much more realistic sphere of influence for each settlement.

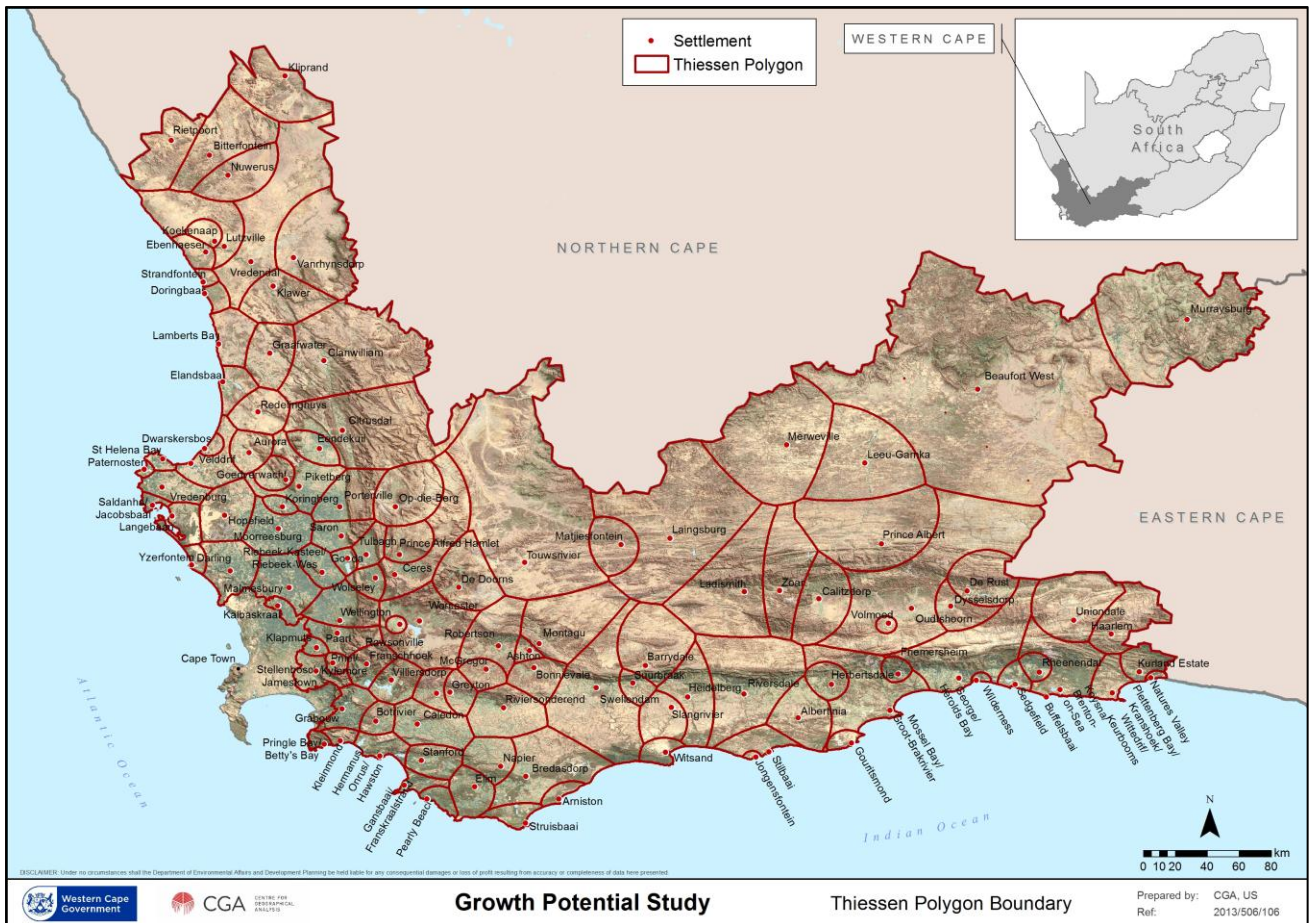


Figure 5 Weighted Thiessen polygons used as basis for data collection and analysis at settlement level

3.2.3 GIS data collection

The GIS data collection and analysis was largely focussed within the Western Cape's provincial boundaries. It is however recognised that factors outside the extent of the Western Cape (e.g. inter-provincial, national and international factors) may impact on the growth potential of towns and municipalities and data from outside the provincial boundary was thus used in some instances (e.g. to calculate the distance of a town from Port Elizabeth). Data for most of the 85 indicators was collected from secondary data sources such as the Census 2001 and 2011 results, existing maps, documents and GIS databases. In many cases, the data had to be edited, reformatted and/or converted in preparation for analysis. The bulk of these manipulations were carried out in ArcGIS 10.1. The data source(s) of each indicator, as well as a description of the manipulations that were performed on each, are shown in the metadata table (see Appendix C).

3.2.4 Sensitivity analysis

The most prominent methodological factors that could influence the analysis outcome of growth potential include the selection of indicators and the application of data reduction techniques, the method applied to normalise the raw data, determining the relative importance (weights) of different criteria, and the method of classification of results. Sensitivity analysis is a common approach to determining how sensitive a statistical model is to input and model variations (Levine & Renelt 1991). It essentially involves the systematic

modification of input variables and/or procedures to see how such changes will affect the output. This section describes the approach used in carrying out the sensitivity analysis to illustrate the impact that variations in methodology has on the classifications of municipalities.

Models

The variables that were considered in the sensitivity analysis as different combinations of models were:

- The type of normalisation method applied to raw data (either linear or z-score transformation);
- The application of data reduction techniques to identify “core indicators” as opposed to using a full set of indicators (bivariate correlation analysis or principle component analysis);
- Either using equal weights for all indicators or introducing the use of a weighting system to reflect the relative importance of different criteria;
- The application of alternative classification methods to resulting index values (either natural breaks or quintiles).

Table 5 describes the twelve “models” that were included in the sensitivity analysis based on various combinations of these factors. Each model represents one combination of different variables.

Indicator reduction

One of the potential dangers of using large numbers of indicators in composite indices such as growth potential is the inherent risk of “compensability”. This refers to the possibility of trading off a poor result in one component against a strong performance or positive result in another component. The most commonly used approach to overcome this challenge is the application of multivariate techniques such as principal component or factor analysis (Booyesen 2002; Grasso & Canova 2008). In a nutshell, the purpose of these techniques is to determine the number of latent variables underlying the data, to condense the data, and to define the content and meaning of the factors accounting for the variation in the data. The benefits of using a statistically selected and reduced set of indicators are threefold. Firstly, there are fewer data sets that need to be collected to run a follow-up analysis of the growth potential of small towns. Secondly, fewer data sets make it easier for constant monitoring and evaluation of the growth potential in towns. Thirdly, the impact of specific interventions to unlock growth potential in towns can be measured in order to gauge the success of interventions.

Table 5 Models included in the sensitivity analysis

Model	Redundancy removal	Weights	Normalisation method	Classification method
AELN	Correlation analysis	No	Linear	Natural breaks
AEZN	Correlation analysis	No	Z-score	Natural breaks
AULN	Correlation analysis	Yes	Linear	Natural breaks
AUZN	PCA	Yes	Z-score	Natural breaks
CELN	PCA	No	Linear	Natural breaks
CEZN	PCA	No	Z-score	Natural breaks
CULN	PCA	Yes	Linear	Natural breaks
CUZN	PCA	Yes	Z-score	Natural breaks
AELQ	Correlation analysis	No	Linear	Quintiles
AEZQ	Correlation analysis	No	Z-score	Quintiles
AULQ	Correlation analysis	Yes	Linear	Quintiles
AUZQ	Correlation analysis	Yes	Z-score	Quintiles
CELQ	PCA	No	Linear	Quintiles
CEZQ	PCA	No	Z-score	Quintiles
CULQ	PCA	Yes	Linear	Quintiles
CUZQ	PCA	Yes	Z-score	Quintiles

Factor analysis is a technique that enables the identification of patterns that underlie the correlations between a number of variables and can thus be described as a data reduction technique. It is based on the premise that the variation observed in a variety of individual variables reflects the patterns of a smaller number of some deeper or more fundamental features (also referred to as the "factors"). Factor analysis provides a reliable means of simplifying the relationships and identifying within them which factors, or common components of association between groups of variables, underlie the relationships (Acton, Miller, Fullerton & Maltby 2009).

A separate factor analysis was performed on each of the individual sets of potential indicators forming part of the five sub-indices (human capital, economic, physical, infrastructure, and institutional). For the purposes of developing the composite indices, the indicators with the highest loading on the components with Eigenvalues larger than 1 were selected for inclusion in each index. The 85 potential indicators were thus reduced to 25 core indicators for the settlement level analysis and 23 indicators for the municipal level analysis. This approach was used for models CELN, CEZN, CULN, CUZN, CELQ, CEZQ, CULQ, and CUZQ.

A potential drawback of multivariate data reduction techniques is the fact that it allows no control over the selection of components and thus it introduces conceptual rigidity in composite indexing. There is often also a general perception that indices derived from a larger set of indicators must be "better" or "more reliable" than those based on a reduced set of indicators (derived from statistical data reduction techniques).

A second approach to removing data redundancy is to carry out a bivariate correlation analysis. Essentially this approach allows for the identification of indicators that are very similar (i.e. have a high statistical correlation to each other). Based on this approach, indicators that were highly correlated ($R^2 > 0.7$) were removed from further analyses, and the original set of 85 indicators was reduced to 50 indicators on settlement level and 56 on municipal level. This approach was used for models AELN, AEZN, AULN, AUZN, AELQ, AEZQ, AULQ, and AUZQ.

Weights

Weighting entails the process of attributing a greater value or contribution to one indicator or index than another, thus reflecting the relative importance of each of the variables. By nature different indicators do not have equal importance for determining growth potential. The number of businesses in a settlement, for instance, be considered more important for measuring economic growth potential than property tax value. There are generally two alternative approaches to the weighting of variables, i.e. through consultation with experts and through empirical techniques. These two approaches can also be applied in combination.

The conventional practice of selecting weights is following consultation with experts which may also involve a questionnaire survey (Xing, Horner, El-Haram & Bebbington 2009). Participants are often asked to indicate the relative importance of each of the variables on a scale of 1 to 5 (where 1 = of little importance and 5 = of great importance). This approach is often seen as subjective. Multivariate techniques present an empirical and relatively more objective approach for weight selection (Booyesen 2002:127). In the case of principal component analysis, components can be weighted with the proportion of variance in the original set of variables explained by the first principal component of that particular component. The advantage of this technique is that it produces a set of weights that explain the largest variation in the original variables. However, as indicated above, a potential drawback is that multivariate techniques allow no control over the weighting of components and thus introduce a measure of conceptual rigidity in composite indexing. An alternative approach would be to combine the use of a variety of weighting techniques and compare results across these techniques before selecting either one or a combination of techniques in deriving index estimates. Research has, however, shown that the different indices remained fairly well correlated, even with the use of different weighting systems (Morris, 1979)

For the purpose of the sensitivity analysis, the indicators were weighted for some of the models using the principle component analysis approach. Two alternative weighting schemes were applied. In the case of models CULN, CUZN, CULQ, and CUZQ only the indicator with the highest loading on each principle component (or factor) was used and allocated a weight in accordance to the proportion of the overall variance explained by the particular component (or factor). In the case of models CELN, CEZN, CELQ, and CEZQ a weight in accordance to the proportion of the overall variance explained by the particular component (or factor) was assigned to all the indicators in the principle component. For all the other models, equal weights were applied to all indicators in each index.

Classification method

The resulting growth potential values were grouped into five classes (labelled very high, high, medium, low and very low) using two alternative approaches. The first approach involves the use of natural breaks, also known as Jenks' algorithm (Jenks 1967), while the second approach was the use of quintile classification. Jenks' algorithm uses statistical

analyses to detect natural breaks in the histograms of the raw index values, while quintile classification creates groups that are equal in size. The former approach was taken for models AELN, AEZN, AULN, AUZN, CELN, CEZN, CULN and CUZN, while quintile classification was applied in models AELQ, AEZQ, AULQ, AUZQ, CELQ, CEZQ, CULQ and CUZQ.

Normalisation method

Indicators are often measured in different scales (i.e. nominal, ordinal, interval and ratio) and must, therefore, be reformatted (normalised) to a common scale before they can be combined into an index. Two normalisation models, namely linear and z-score scaling, were included in the sensitivity analysis. Linear scaling (Equation 1) uses the range of a variable as basis for standardization. The main advantage of linear scaling is that it normalises values to a range between 0 and 1. This is especially useful when different variables are combined using weights (levels of importance) as the range of the outcome can be determined prior to the evaluation (Malczewski 1999). The drawback of linear scaling is that it is very sensitive to outliers. Z-score scaling (Equation 2) is more resilient to outliers because it is based on the mean and standard deviation of a variable, but produces values with unpredictable ranges. The effect of this was tested in the sensitivity analysis.

$$X_i = \frac{R_i - R_{\min}}{(R_{\max} - R_{\min})} \times m \quad \text{Equation 1}$$

where:

- X_i is the standardised score;
- R_i is the raw score;
- R_{\min} represents the minimum score;
- R_{\max} is the maximum score; and
- m is an arbitrary multiplier representing the upper standardised range value.

$$z_{ik} = (x_{ik} - \bar{x}_k) / sd_k \quad \text{Equation 2}$$

where

- z_{ik} is the standardised score (also called z-score);
- x_{ik} is the raw value of variable k for settlement i ;
- \bar{x}_k is the mean value of variable k for all settlements in the province;
and
- sd_k is the standard deviation of variable k .

Linear scaling was applied to models AELN, CELN, CULN, AELQ, CELQ and CULQ, while z-score normalisation was used in models AEZN, CEZN, CUZN, AEZQ, CEZQ and CUZQ.

Indicator aggregation

The indicator values and weights were combined to produce aggregated values for each of the five indices. This was done using weighted linear combination (WLC) (see Equation 3). In contrast to high-risk Boolean intersect (AND) and union (OR) operations, WLC produces a risk-averse (Eastman 2000) and full trade-off solution (Mahini & Gholamalifard 2006). The result is an aggregated value ranging from 0 to 1 for each index. These values were converted to percentages for easier interpretation. For the combined *Growth Potential Index*, the average aggregated value of the *Human Capital*, *Economic*, *Physical*, *Infrastructure* and *Institutional* indices were calculated.

$$P = \sum w_i x_i \quad \text{Equation 3}$$

where:

- P is the aggregated value;
- w_i is the weight of indicator i ; and
- x_i is the standardised score of indicator i .

The calculation of aggregated values for the individual and combined indices was automated in ArcView GIS to allow rapid recalculation in the event of a change in the underlying data, indicators or indices. This automation proved to be invaluable during the course of the study as it allowed for index updating as new data was received.

Sensitivity analysis results

The results of the sensitivity analysis, through the application of the 16 different models described in Table 5, are shown below at municipal level (Table 6). The settlement level results are available in Appendix F. Columns labelled AELN to CUZQ represent the growth potential classification per model tested, where 1 = Very Low, 2 = Low, 3 = Medium, 4 = High, and 5 = Very High. For the purposes of comparing and interpreting the results in Table 6, a number of basic statistical indicators were applied. These include the mean classification (MEAN) value and the standard deviation (SD) which shows the variation or dispersion from the mean. The sensitivity of the results is best reflected by the standard deviation values and may serve as a measure of uncertainty. A larger standard deviation indicates that the results from the various models deviated more from the mean while smaller standard deviation values indicates that they are clustered closely around the mean value. These standard deviation values can be interpreted as follows:

- A SD of 0 implies that all the growth potential values resulting from the different models are exactly the same, hence a SD of 0. A total of 24 settlements and 6 municipalities fall into this category.
- A SD of larger than 0 and 0.50 or less implies limited variation of the values resulting from the different models, and that they are mainly clustered closely around the mean value. In these cases it effectively means that the growth potential class will not change regardless of the method applied. A total of 47 settlements and 15 municipalities fall into this category.

- A SD larger than 0.5 and smaller than 1 is indicative of cases that are more sensitive to alternative methods and where the growth potential class may vary by 1 category depending on the methodology applied. A total of 46 settlements and 3 municipalities fall into this category.
- A SD larger than 1 reflects cases where the results from the different models are scattered further away from the mean and where the growth potential results are likely to be different for various models. None of the settlement or municipalities falls into this category.

Table 6 Growth potential sensitivity analysis results at municipal level

Municipality	MEAN	SD	AELN*	AEZN	AULN	AUZN	CELN	CEZN	CULN	CUZN	AELQ	AEZQ	AULQ	AUZQ	CELQ	CEZQ	CULQ	CUZQ
Matzikama	2.13	0.34	2	3	2	2	2	3	2	2	2	2	2	2	2	2	2	2
Cederberg	2	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Bergrivier	3.13	0.34	3	4	3	3	3	4	3	3	3	3	3	3	3	3	3	3
Saldanha Bay	3.94	0.25	4	4	4	4	4	4	3	4	4	4	4	4	4	4	4	4
Swartland	4.06	0.25	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5
Witzenberg	1.94	0.77	1	2	1	1	1	2	3	3	2	2	2	1	2	2	3	3
Drakenstein	5	0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Stellenbosch	5	0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Breede Valley	2.94	0.25	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3
Langeberg	2.38	0.5	3	3	2	3	3	3	2	3	2	2	2	2	2	2	2	2
Theewaterskloof	4	0.37	4	4	4	4	4	4	4	4	4	4	4	3	4	4	5	4
Overstrand	4.25	0.45	4	5	5	5	4	5	4	4	4	4	4	4	4	4	4	4
Cape Agulhas	2.94	0.25	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3
Swellendam	3.13	0.34	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4
Kannaland	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hessequa	2.88	0.62	3	3	4	4	3	3	2	2	3	3	3	3	3	3	2	2
Mosselbaai	4.88	0.34	5	5	5	5	5	5	4	4	5	5	5	5	5	5	5	5
George	5	0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Oudtshoorn	2.06	0.25	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2
Bitou	4	0.73	4	5	5	5	4	5	3	3	4	4	4	4	4	4	3	3
Knysna	4.75	0.45	5	5	5	5	5	5	4	4	5	5	5	5	5	5	4	4
Laingsburg	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Prince Albert	1.13	0.34	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1
Beaufort West	1.25	0.45	1	2	1	2	1	2	1	1	1	1	1	2	1	1	1	1

* Selected model (see next section)

It is clear from the settlement level results that George/Heroldsbaai, Knysna/Brenton-on-sea, Mosselbaai/Groot Brak, Paarl & Stellenbosch/Jamestown were classified by all sixteen models as having a very high growth potential. Consequently, the standard deviation (SD) of the growth potential classifications is zero for these settlements, indicating that there is no variation in the growth potential classification (i.e. that no matter what methodology is used, these settlements are always classified as having a Very High growth potential). Conversely, Bitterfontein, Calitzdorp, De Rust, Doringbaai, Dysseldorp, Leeu Gamka,

Kliprand, Merweville, Murraysburg, Nuwerus, Rietpoort and Zoar were classified by all models as having a very low growth potential. None of the settlements registered a standard deviation of more than one, indicating that the overall variation between the methodologies is low and the risk of using different methodologies to model growth potential at settlement level is not significant. A similar observation can be made at municipal level, where only three municipalities, namely Hessequa (0.62), Bitou (0.73) and Witzenberg (0.77), registered standard deviations of more than 0.5 in the growth potential classifications (Table 6).

Model selection

Given the low variation between classifications resulting from different methodologies (models), the selection of the most appropriate method seems less important. However, Van Niekerk et al. (2011) argued that (from a strictly technical point of view) the use of indicator reduction techniques such as principle component analysis is the most robust approach to modelling growth potential as it reduces the effect of data duplication and compensability. Van Niekerk et al. (2011) also recommended that some form of weighting of indicators should be undertaken according to their relative importance in (or contribution towards) a specific index. In addition, the natural breaks classification method was proposed as the best-suited for the task at hand as it groups cases (settlements and municipalities) with similar scores together, rather than by their ordinal numbers. When all of these factors are taken into consideration, models CULN and CUZN are theoretically the most appropriate as they meet all these requirements.

However, the benefits of using complex statistical techniques to remove duplication and to establish weights has to be traded off against the added complexity and associated perceived lack of transparency of such techniques. There is a general perception that the use of a large number of indicators yields indices of a "better quality" (i.e. "more is better"); a perception that is difficult to change. Given that many of the end users of the GPS2013 results might not have the necessary level of technical understanding of (or trust in) statistical procedures such as principle component analyses and given that the results of the CULN and CUZN models do not significantly differ from the other models (the mean square difference between these models and the AELN model is 0.003 and 0.0006 respectively), it was thus proposed that the results of the AELN model be used in this study. This model is very simple to implement as it uses most of the indicators (simple bivariate correlation is used to remove obvious duplications instead of principle correlation analysis) and allocates equal weights to each indicator within an index. The methodology uses linear scaling and natural breaks classification (see Section 3.2.4). It was however recommend that z-scores be used in combination with linear scoring when studying individual indicators as it is useful to highlight deviations from the norm. It was also recommended that the standard deviations of individual settlements and municipalities be considered when the GPS2013 results are used to inform decision making processes. The outcome of the implementation of the AELN model at settlement and municipal level is provided in the next section.

4. GPS2013 AS DECISION SUPPORT TOOL

4.1 Introduction

As discussed in Section 3.1, the primary objective of the quantitative analysis component of the GPS2013 was to determine the growth potential of settlements (outside the City of Cape Town) in terms of potential future economic, population and physical growth. The analysis of growth potential is based on two fundamental and related concepts: inherent preconditions for growth and innovation potential. Five thematic indices formed the basis for modelling the growth preconditions and innovation potential within each settlement and municipality. For this purpose 85 spatial indicators (e.g. availability and quality of infrastructure, level of education, crime statistics) were collected for 131 settlements and 24 local municipalities. A similar approach was used in previous versions of the GPS (GPS2004 and GPS2010).

From interactions with users of the previous GPS products it became clear that the results were not always applied in the most effective and appropriate manner. Many users simply used the overall composite *Growth Potential Index* for various and widely differing decision support requirements and ignored the other more targeted indices and indicators that the GPS provides. It is critical for users to understand that the thematic and composite indices provide an overall perspective of growth potential and socio-economic needs in the Western Cape, with its primary application to inform and guide strategic and cross-cutting decisions at a provincial level (see Table 7). These composite indices should however be used in conjunction with a broader range of decision support tools when informing specific programmes within individual departments.

Table 7 Application levels of GPS2013 indices, indicator bundles and individual indicators

	Provincial Strategic Level Guidance	Cross-cutting Strategic Objectives	Individual Departmental Programmes & Objectives	Programme or Project-Specific
Composite Indices	●	○	○	○
Thematic Indices	○	●	○	○
Indicator Bundles	○	○	●	○
Individual Indicators	○	○	○	●

● Primary application

○ Secondary application

In addition to the composite and thematic indices, the GPS2013 also provides "indicator bundles" that can more effectively inform decisions relating to specific departmental programmes and objectives. For example, by applying four GPS2013 indicators that directly relate to housing (% Households living in informal housing, Level of overcrowding, Population growth rate and In-migrants) a geographical perspective can be created of the spatial distribution of housing need and influencing factors. At a fourth level of application, individual indicators may in some cases also be appropriate for guiding specific interventions, programmes and projects.

The following sections provide the results of the quantitative analysis at all four application levels. Given the large number of possible permutations of individual indicators, only a selection of indicator bundles and individual indicators is discussed to demonstrate how these products can be applied to inform decisions.

4.2 Composite indices

4.2.1 Growth potential

A comparison between the settlement and municipal level growth potential classifications is provided in this section as a set of figures, tables and maps. The growth potential results at municipal level are shown in Figure 6. Knysna (100), Stellenbosch (99) and Drakenstein (95) performed the best in this composite index, while Kannaland (0), Laingsburg (1) and Prince Albert (4) achieved the lowest overall scores. Figure 7 provides a graphical view of the ordered raw scores of the preferred model (AELN) at settlement level. The colours of the bars indicate the settlement classification into Very High (blue), High (green), Medium (yellow), Low (orange) and Very Low (red) growth potential. At the high end of the growth potential spectrum are towns Paarl (100) and George/Heroldsbaai (100), followed by Stellenbosch/Jamestown (91) and Knysna/Brenton-on-Sea (89). Conversely, the towns of Kliprand (0), Murraysburg (12), Rietpoort (15), and Bitterfontein (18) represent the lower end of the *Composite Growth Potential Index*.

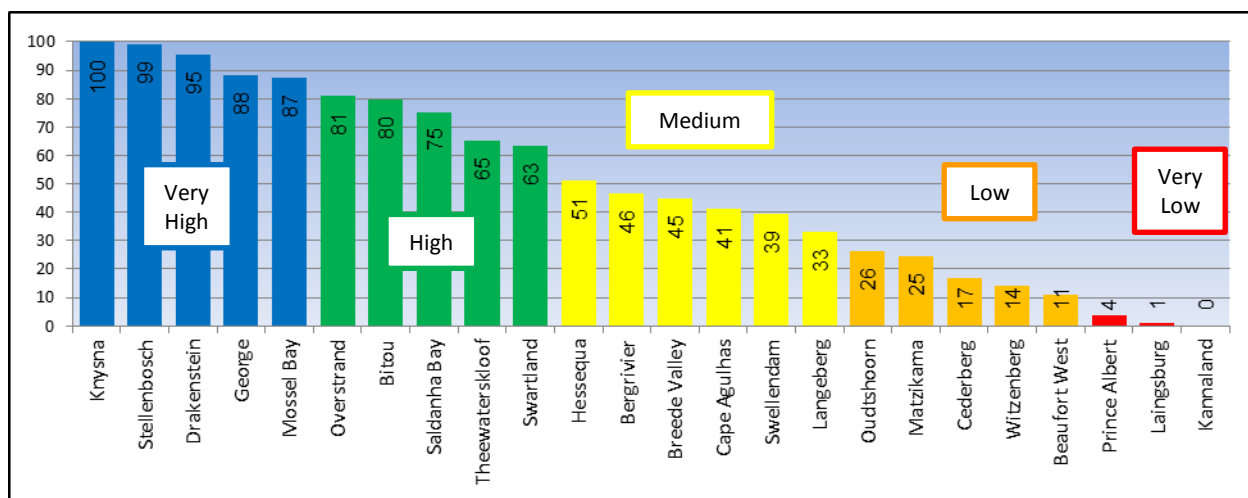


Figure 6 Growth potential at municipal level

It is clear that there is significant variation between the results at settlement level and those at municipal level. Examples include George municipality in which the settlement George performs well in most indices, while Uniondale scored low in almost all of the indices. The index values at municipal level thus represent an aggregate value of a range of individual settlements, often characterised by widely varying characteristics. The index values at municipal level should consequently be interpreted and used with caution and never in isolation from the individual settlement level indices.

Table 8 provides a cross-tabulation of the composite *Growth Potential Index* classification results at settlement and municipal level. The results indicate a general tendency of very high growth potential settlements that are located in very high growth potential

municipalities (e.g. Paarl, George, Stellenbosch) as well as the very low growth potential settlements that are located in very low growth potential municipalities (e.g. Calitzdorp, Merweville, Zoar). There seems to be a strong relationship between the municipal level classification and the settlement level classification, with no very high growth potential settlements occurring in very low, low or medium growth potential municipalities. Conversely, none of the very low growth potential settlements are located within municipalities with high or very high growth potential. There are however a few exceptions to this general trend. For instance, Haarlem, Uniondale and Herbertsdale are classified as having a low growth potential, but are all located in municipalities with very high growth potential (George and Mosselbaai). Ceres and Prince Alfred Hamlet are classified as having a medium growth potential in spite of being located in a low potential municipality (Witzenberg).

When the composite *Growth Potential Index* results are mapped at provincial level (Figure 8) a number of spatial trends becomes apparent. The first observation is that many of the settlements that were classified as having a high or very high growth potential are clustered around the City of Cape Town. All of the municipalities adjacent to the metropolitan area were classified as having either a high or very high growth potential, most likely influenced by their proximity to Cape Town. This cluster includes individual towns such as Malmesbury, Paarl, Stellenbosch, and Betty's Bay which were all classified as having a very high growth potential. A second cluster of very high and high potential settlements occurs in the Saldanha Bay region, with Vredenburg (very high growth potential) acting as the main node. The third cluster of towns with high and very high growth potential is located along the coast of the Overstrand municipal area, in particular Betty's Bay, Pringle Bay, Kleinmond, Hermanus and Gansbaai. A fourth cluster of high potential municipalities and settlements are located along the Garden Route, with Mosselbaai, George and Knysna being classified as having a very high growth potential and Plettenberg Bay as high potential. Most of the settlements and municipalities in the interior, specifically the Karoo region, were classified as having a limited (i.e. very low or low) growth potential.

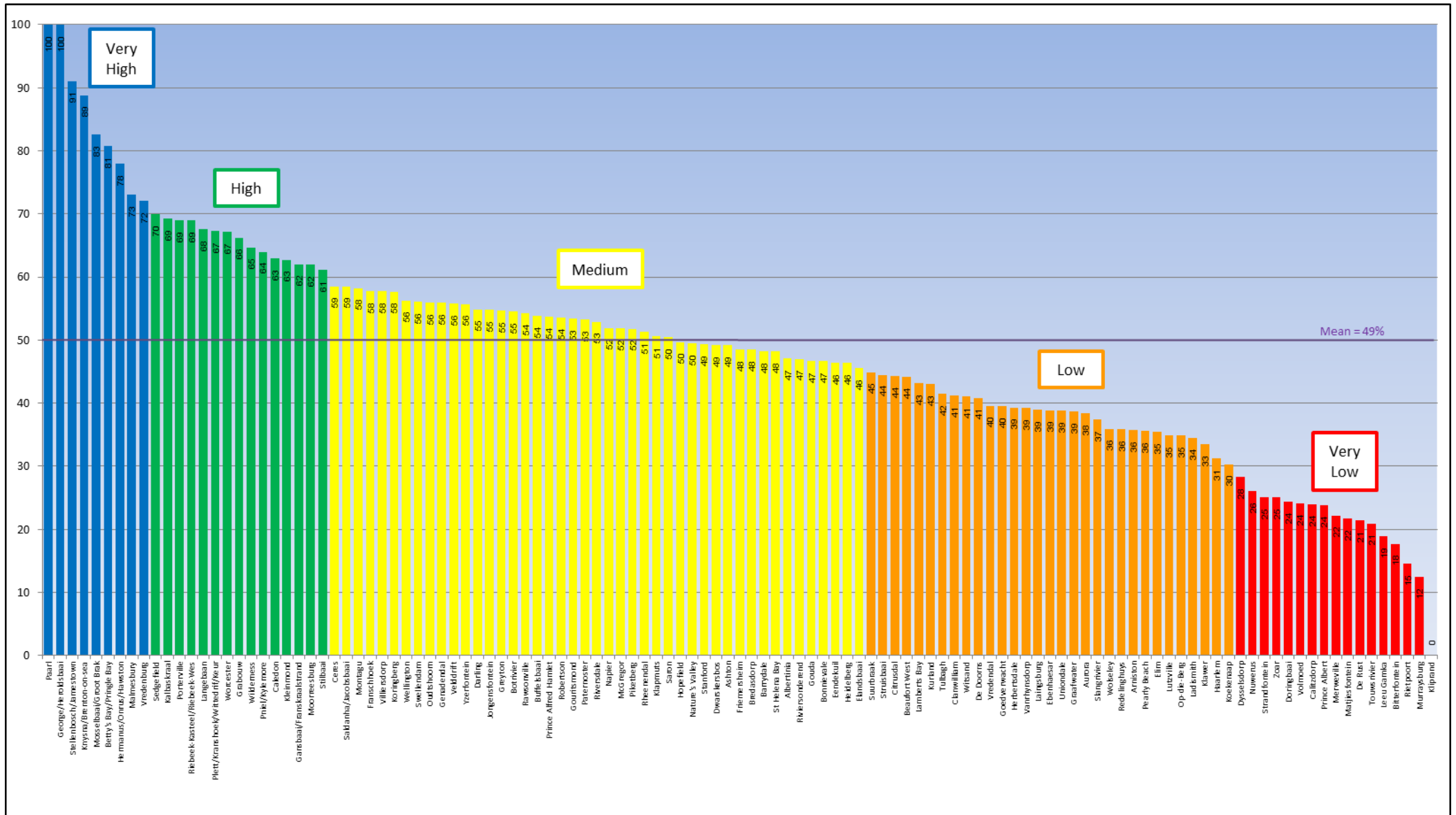


Figure 7 Growth potential at settlement level

Table 8 Composite Growth Potential Index classification for settlements and municipalities

		Municipality level classification (the municipality of each settlement is shown in parenthesis)				
		Very low	Low	Medium	High	Very high
Settlement level classification (the municipality of each settlement is shown in parenthesis)	Very low	Calitzdorp (Kannaland) Leeu Gamka (Prince Albert) Matjiesfontein (Laingsburg) Prince Albert (Prince Albert) Zoar (Kannaland)	Bitterfontein (Matzikama) De Rust (Oudtshoorn) Doringbaai (Matzikama) Dysselsdorp (Oudtshoorn) Kliprand (Matzikama) Nuwerus (Matzikama) Rietpoort (Matzikama) Strandfontein (Matzikama) Volmoed (Oudtshoorn) Merweville (Beaufort West) Murraysburg (Beaufort West)	Touwsrivier (Breede Valley)		
	Low	Ladismith (Kannaland) Laingsburg (Laingsburg)	Citrusdal (Cederberg) Clanwilliam (Cederberg) Ebenhaesar (Matzikama) Graafwater (Cederberg) Klaver (Matzikama) Koekenaap (Matzikama) Lamberts Bay (Cederberg) Lutzville (Matzikama) Vanrhynsdorp (Matzikama) Vredendal (Matzikama) Op-die-Berg (Witzenberg) Tulbagh (Witzenberg) Wolseley (Witzenberg) Beaufort West (Beaufort West)	Arniston (Cape Agulhas) Aurora (Bergrivier) De Doorns (Breede Valley) Elim (Cape Agulhas) Goedverwacht (Bergrivier) Redelinghuys (Bergrivier) Slangrivier (Hessequa) Struisbaai (Cape Agulhas) Suurbraak (Swellendam) Witsand (Hessequa)	Kurland (Bitou) Pearly Beach (Overstrand)	Haarlem (George) Herbertsdale (Mosselbaai) Uniondale (George)
	Medium	Elandsbaai (Cederberg) Oudtshoorn (Oudtshoorn) Prince Alfred Hamlet (Witzenberg) Ceres (Witzenberg)	Albertinia (Hessequa) Ashton (Langeberg) Barrydale (Swellendam) Bonnievale (Langeberg) Bredasdorp (Cape Agulhas) Dwarskersbos (Bergrivier) Eendekuil (Bergrivier) Gouritsmond (Hessequa) Jongensfontein (Hessequa) Heidelberg (Hessequa) McGregor (Langeberg) Montagu (Langeberg) Napier (Cape Agulhas) Piketberg (Bergrivier) Rawsonville (Breede Valley) Riversdale (Hessequa) Robertson (Langeberg) Swellendam (Swellendam) Velddrift (Bergrivier)	Botrivier (Theewaterskloof) Darling (Swartland) Genadendal (Theewaterskloof) Greyton (Theewaterskloof) Hopefield (Saldanha Bay) Koringberg (Swartland) Nature's Valley (Bitou) Patemoster (Saldanha Bay) Riviersonderend (Theewaterskloof) Saldanha/Jacobsbaai (Saldanha Bay) St Helena Bay (Saldanha Bay) Stanford (Overstrand) Villiersdorp (Theewaterskloof) Yzerfontein (Swartland)	Buffelsbaai (Knysna) Franschhoek (Stellenbosch) Friemersheim (Mosselbaai) Gouda (Drakenstein) Klapmuts (Stellenbosch) Rheenendal (Knysna) Saron (Drakenstein) Wellington (Drakenstein)	
	High	Porterville (Bergrivier) Stilbaai (Hessequa) Worcester (Breede Valley)	Caledon (Theewaterskloof) Gansbaai/Franskraalstrand (Overstrand) Grabouw (Theewaterskloof) Kalbaskraal (Swartland) Kleinmond (Overstrand) Langebaan (Saldanha Bay) Moorreesburg (Swartland) Plettenberg Bay/Kranshoek/Wittedrif/Keurboomsrivier (Bitou) Riebeek-Kasteel/Riebeek-Wes (Swartland)	Pniel/Kylemore (Stellenbosch) Sedgefield (Knysna) Wilderness (George)		
	Very high	Betty's Bay/Pringle Bay (Overstrand) Hermanus/Onrus/Hawston (Overstrand) Malmesbury (Swartland) Vredenburg (Saldanha Bay)	George/Heroldsbaai (George) Knysna/Brenton-on-sea (Knysna) Mosselbaai/Groot Brak (Mosselbaai) Paarl (Drakenstein) Stellenbosch/Jamestown (Stellenbosch)			

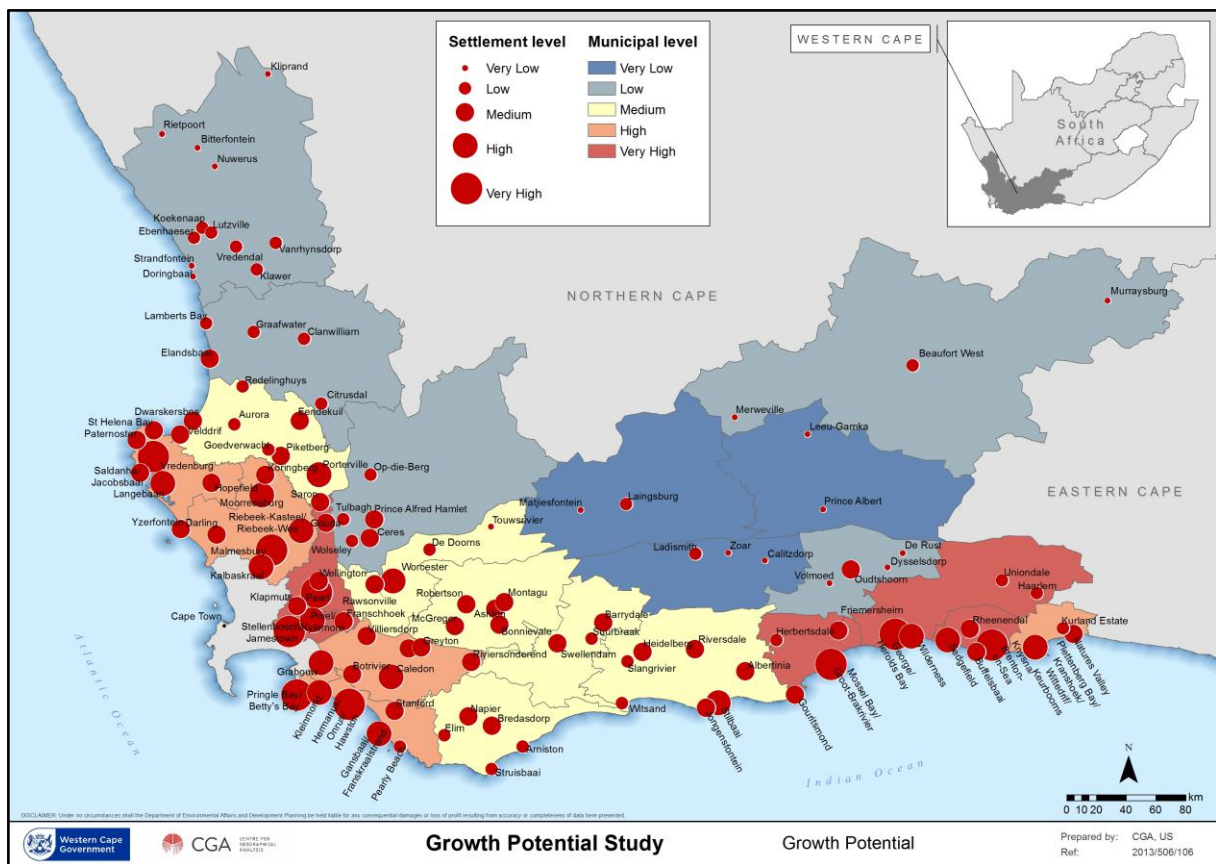


Figure 8 Spatial representation of the Growth Potential Index at settlement and municipal level

The overall growth potential of individual towns must also be interpreted within the context of their population sizes. The results do not imply that a relatively small town such as Pringle Bay and Betty's Bay will necessarily grow to the same size as other towns or similar growth potential (e.g. George or Paarl). What it does imply is that Pringle Bay and Betty's Bay have a much higher potential for growth compared to other towns of a similar size (Figure 10c). Conversely, it also implies that not all large towns necessarily have a high or very high growth potential (Figure 10a). However, overall, the towns with larger population sizes generally performed better in the *Growth Potential Index*. It is important to note that this trend is despite the fact that the *Growth Potential Index* does not include indicators relating to the population or physical size (see Appendix A for a full list of indicators used in the *Growth Potential Index*).

This relationship between the size of settlements and the growth potential holds some important potential implications. As illustrated in Figure 9 the 29 towns with the highest growth potential within the province represents 56% of the total provincial population outside the Cape Town metropolitan area. At the other end of the scale, the 53 towns with the lowest growth potential represent less than 20% of the total provincial population (excluding Cape Town metropolitan area).

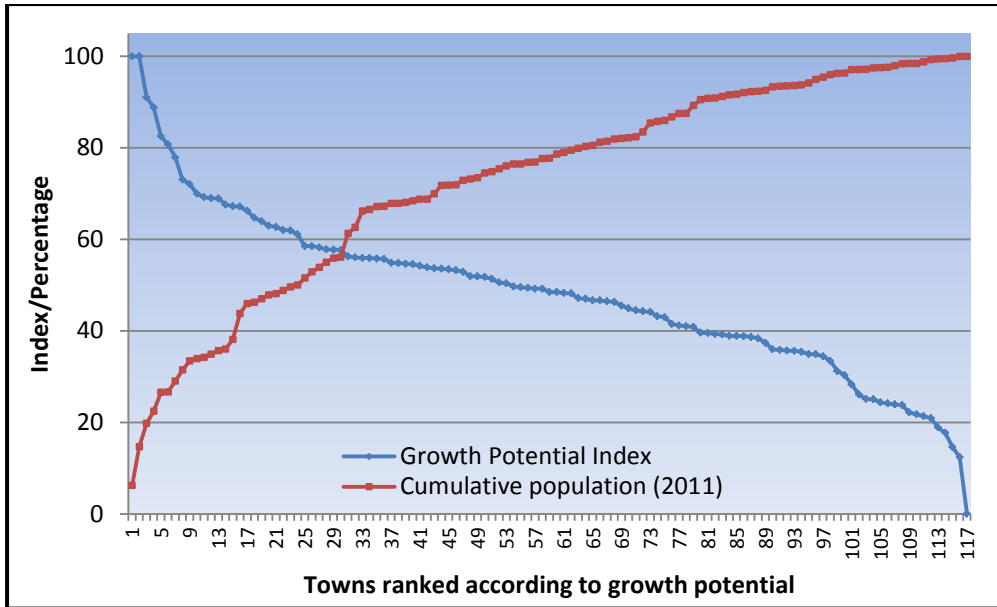


Figure 9 Cumulative population according to descending growth potential

As discussed in Section 3.1, the overall *Growth Potential Index* is meant to guide provincial level strategic decisions and is not intended to be used on its own to inform more operational level or programme-specific interventions or to support decisions relating to individual departmental activities. As noted, the GPS2013 provides a suite of tools at different levels of aggregation that can be applied at different levels of decision-making. Some of these indices are described in the following sections.

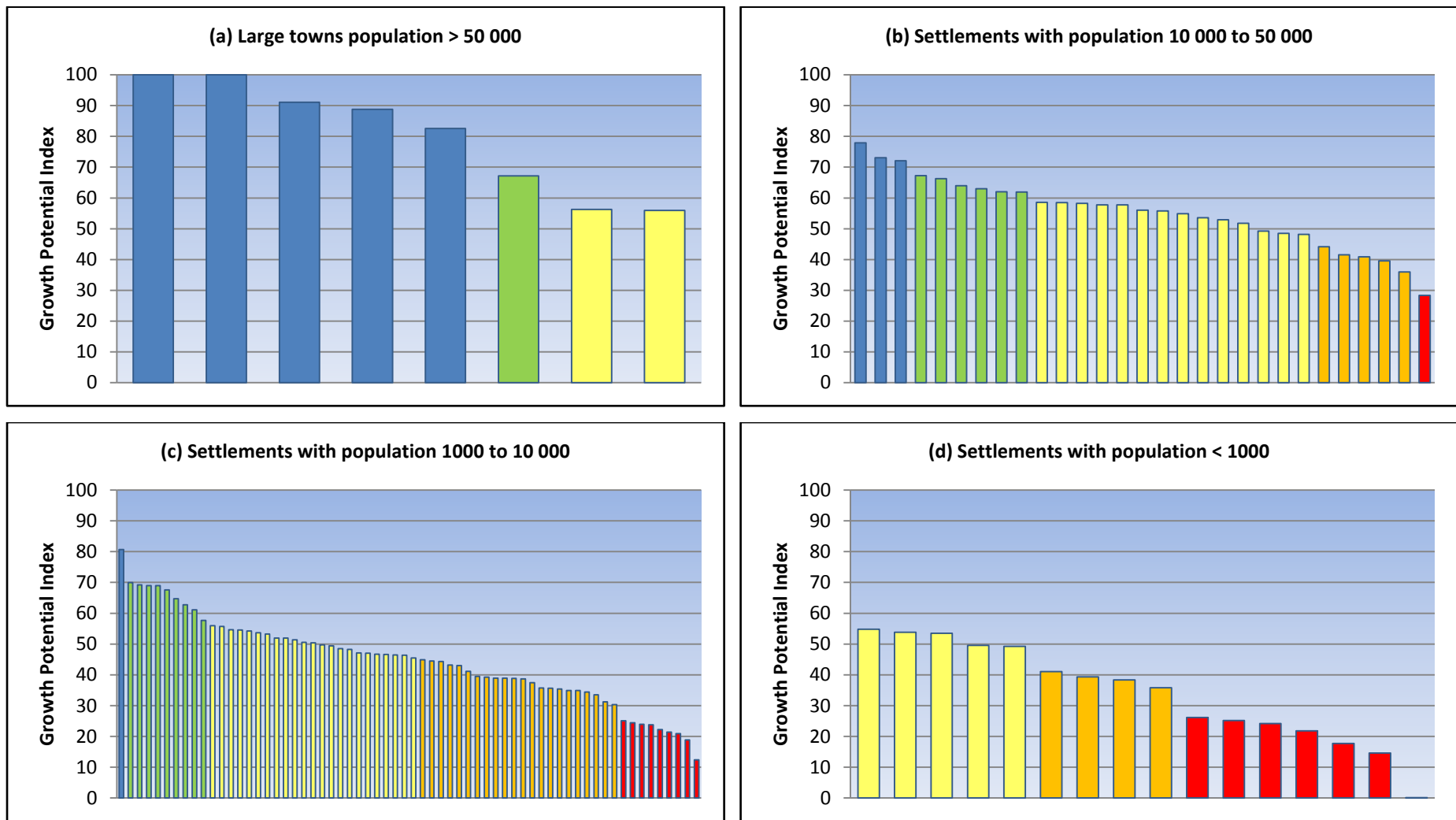


Figure 10 Comparative growth potential of settlements with population (a) larger than 50000, (b) 10 000 to 50 000, (c) 1 000 to 10 000 and (d) smaller than 1 000

4.2.2 Socio-economic Needs Index

Instead of developing a new social needs index, the provincial *Socio-economic Needs Index* (Miller 2013) was adopted in the GPS2013. The indicators used in the index are listed in Table 9. Appendix B provides more detail about how each indicator was developed and weighted.

Table 9 Indicators considered in the Socio-economic Needs Index

#	Indicator name	Municipal level	Settlement level
1	Energy source for lighting [+]	●	●
2	Main water supply [+]	●	●
3	Refuse Disposal [+]	●	●
4	Toilet facilities [+]	●	●
5	Illiteracy (15 years and older) [+]	●	●
6	No schooling (15 years and older) [+]	●	●
7	Adults (20 years and older) without Grade [+]	●	●
8	Adults (25 years and older) without Tertiary qualifications [+]	●	●
9	Dwelling Type [+]	●	●
10	Room Density [+]	●	●
11	Employment [+]	●	●
12	Income [+]	●	●
13	Economic Dependency Ratio [+]	●	●

[+] and [-] indicates whether an indicator had a positive or negative influence on the index respectively
 ● and ○ indicates whether an indicator was respectively included or excluded at a particular level

Figure 11 shows the results when the Socio-economic Needs Index is applied at municipal and settlement level using proportional values (i.e. percentages instead of absolute values). It is clear that, when socio-economic need is defined in proportional values, the towns and municipalities along the West coast and in the interior has the highest socio-economic needs. However, when absolute values are used (i.e. actual number of households and individuals in need) the pattern is significantly different (Figure 12), with many of the high growth potential towns also being classified as having a very high socio-economic need. These results clearly indicate that both the proportional and absolute needs should be considered in decision making processes influencing socio-economic interventions. This aspect is illustrated in Table 10 that provides a cross tabulation of social economic needs expressed in both absolute and proportional terms.

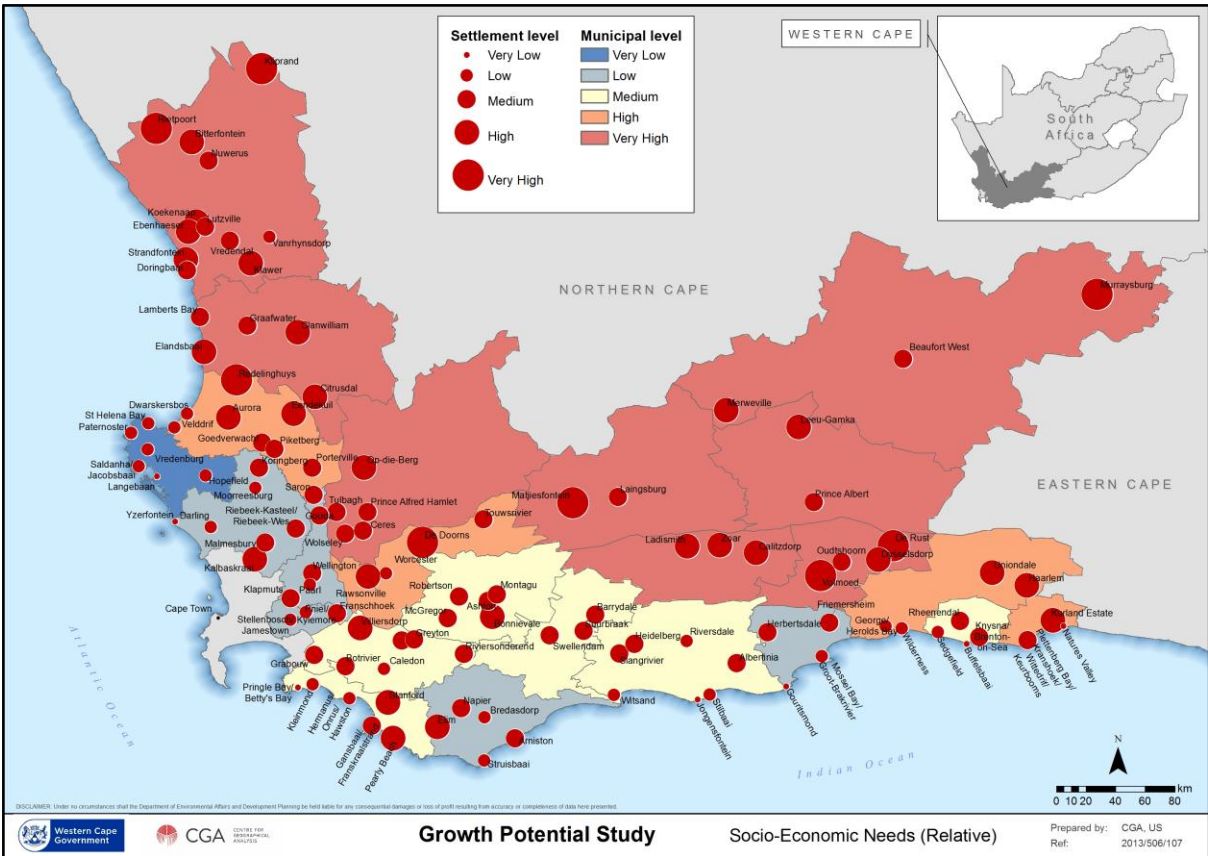


Figure 11 Spatial representation of the Socio-economic Needs Index (proportional) results

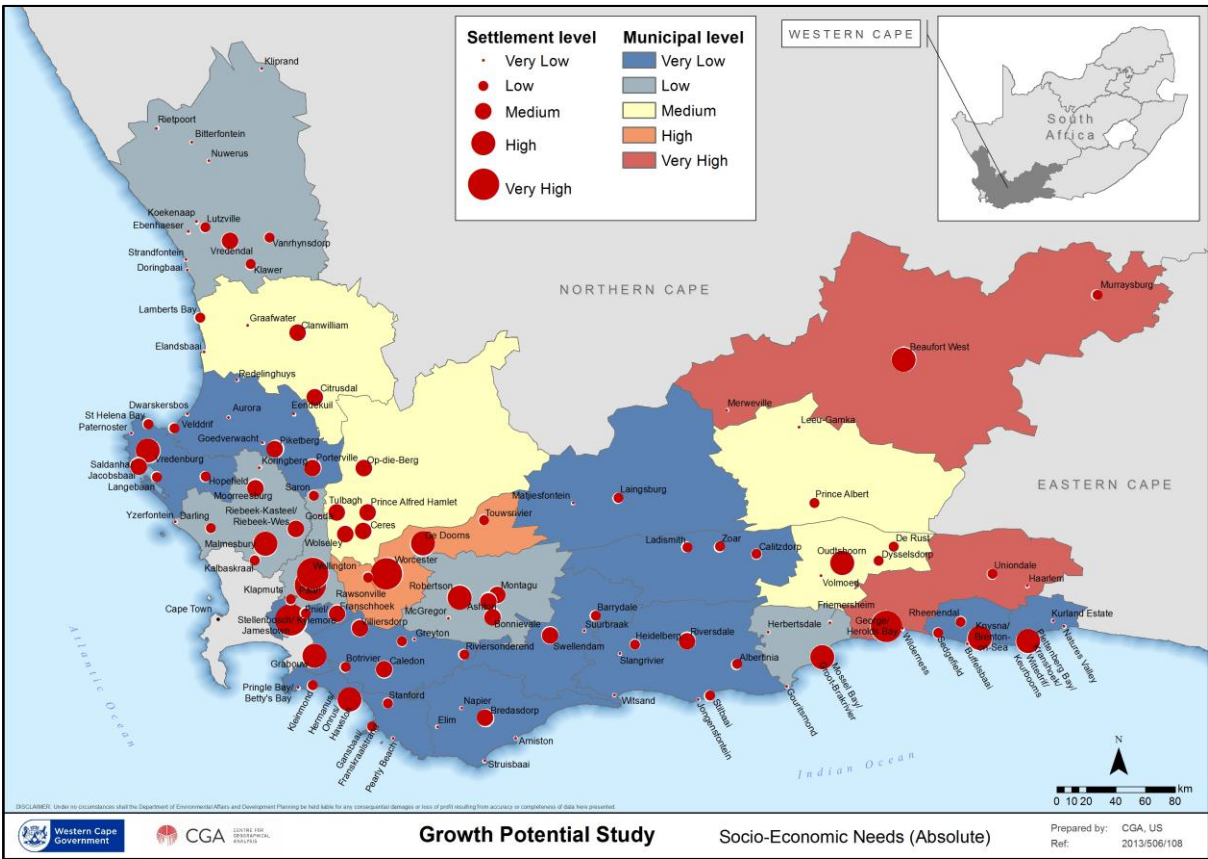


Figure 12 Spatial representation of the Socio-economic Needs Index (absolute) results

Table 10 Comparison of absolute and proportional socio-economic needs at settlement level

		Absolute socio-economic needs				
		Very low	Low	Medium	High	Very high
Proportional socio-economic needs	Very low	Betty's Bay/Pringle Bay Buffelsbaai Gouritsmond Jongensfontein Yzerfontein	Langebaan			
	Low	Dwarskersbos Nature's Valley Paternoster Struisbaai Wilderness Witsand	Darling Hopefield Kleinmond Pniel/Kylemore St Helena Bay Stilbaai Vanrhynsdorp Veldrift	Bredasdorp Caledon Moorreesburg Saldanha/Jacobsbaai	Hermanus/Onrus/Hawst on Vredenburg	George/Heroldsbaai Mosselbaai/Groot Brak Paarl Stellenbosch/Jamestown Worcester
	Medium	Amiston Bitterfontein Doringbaai Elim Friemersheim Gouda Graafwater Greyton Herbertsdale Koringberg McGregor Napier Nuwerus Slangrivier Suurbraak	Albertinia Barrydale Botrivier Genadendal Goedverwacht Heidelberg Klapmuts Laingsburg Lamberts Bay Lutzville Prince Albert Rheenendal Riviersonderend Saron Sedgefield Touwsrivier	Ashton Franschhoek Gansbaai/Franskraalstrand Montagu Piketberg Porterville Prince Alfred Hamlet Riebeek- Kasteel/Riebeek-Wes Riversdale Swellendam Tulbagh Vredendal Wolseley	Beaufort West Ceres Grabouw Knysna/Brenton-on-sea Malmesbury Oudtshoorn Plettenberg Bay/Kranshoek/Wittedrif /Keurboomsrivier Robertson	Wellington
	High	Aurora Ebenhaesar Eendekuil Elandsbaai Haarlem Koekenaap Kurland Leeu Gamka Merweville Pearly Beach Strandfontein	Calitzdorp Dysselsdorp Kalbaskraal Klaver Ladismith Rawsonville Stanford Uniondale Zoar	Bonnievale Citrusdal Clanwilliam Op-die-Berg Villiersdorp		
	Very high	Kliprand Matjiesfontein Redelinghuys Rietpoort Volmoed	De Rust Murraysburg		De Doorns	

When the socio-economic needs are cross-tabulated with growth potential (Table 11) a number of important observations can be made. The settlements located in the bottom right cell of Table 11 shaded in dark blue (George, Mosselbaai, Paarl and Stellenbosch), as well as the three adjacent cells shaded in light blue represent areas of both high or very high growth potential and high or very high socio economic needs expressed in absolute terms. Development and investment in these areas will thus support both economic growth and development, as well as socio-economic development imperatives. Towns and settlements in the bottom left quadrant of the table (e.g. Betty's Bay/Pringle Bay and Wilderness) are characterised by a high or very high growth potential but very low socio-economic needs expressed in absolute terms. The type of investment and development in these areas are thus likely to be very different from those in the bottom right part of the table. Settlements in the top right section of the table represent areas with high

or very high socio-economic needs expressed in absolute terms but with limited growth potential. Beaufort West and De Doorns falls within this category and would again require a different type of development and investment response than the former two examples.

Table 11 Settlement-level socio-economic needs (absolute) cross-tabulated with growth potential

		Socio-economic needs				
		Very low	Low	Medium	High	Very high
Growth potential	Very low	Bitterfontein Doringbaai Kliprand Leeu Gamka Matjiesfontein Merweville Nuwerus Rietpoort Strandfontein Volmoed	Calitzdorp De Rust Dysselsdorp Murraysburg Prince Albert Touwsrivier Zoar			
	Low	Arniston Aurora Ebenhaesar Elim Graafwater Haarlem Herbertsdale Koekenaap Kurland Pearly Beach Redelinghuys Slangrivier Struisbaai Suurbraak Witsand	Goedverwacht Klaver Ladismith Laingsburg Lamberts Bay Lutzville Uniondale Vanrhynsdorp	Citrusdal Clanwilliam Op-die-Berg Tulbagh Vredendal Wolseley	Beaufort West De Doorns	
	Medium	Buffelsbaai Dwarskersbos Eendekuil Elandsbaai Friemersheim Gouda Gouritsmond Greyton Jongensfontein Koringberg McGregor Napier Nature's Valley Paternoster Yzerfontein	Albertinia Barydale Botrivier Darling Genadendal Heidelberg Hopfield Klapmuts Rawsonville Rheenendal Riviersonderend Saron St Helena Bay Stanford Velddrift	Ashton Bonnievale Bredasdorp Franschhoek Montagu Piketberg Prince Alfred Hamlet Riversdale Saldanha/Jacobsbaai Swellendam Villiersdorp	Ceres Oudtshoorn Robertson	Wellington
	High	Wilderness	Kalbaskraal Kleinmond Langebaan Pniel/Kylemore Sedgefield Stilbaai	Caledon Gansbaai/Franskraalstrand Moorreesburg Porterville Riebeek-Kasteel/Riebeek-Wes	Grabouw Plettenberg Bay/Kranshoek/Wittedrif/Keurboomsrivier	Worcester
	Very high	Betty's Bay/Pringle Bay			Hermanus/Onrus/Hawst on Knysna/Brenton-on-sea Malmesbury Vredenburg	George/Heroldsbaai Mosselbaai/Groot Brak Paarl Stellenbosch/Jamestown

4.3 Thematic indices

The *Growth Potential Index* is a combination of five thematic indices reflecting inherent preconditions for growth expressed by economic, physical-natural, and infrastructure aspects and innovation potential expressed by human capital and institutional aspects. The indicators within these indices were analysed and the resulting index values were classified to produce settlement and municipal level ratings per theme. The results of this classification are presented in the following subsections.

4.3.1 Human capital

The indicators that were considered in the *Human Capital Index* are listed in Table 12, while the settlement and municipal classification of the *Human Capital Index* is provided in Table 13. Figure 13 shows that, with the exception of Porterville, all settlements classified as having a very high human capacity are coastal resorts with a large proportion of well-educated residents with relatively high income levels (often retirees). In Betty's Bay/Pringle Bay, for instance, more than 70% of the population of ages 20 - 65 years have at least grade 12 and higher qualifications. The settlements with the lowest human capital capacity include De Rust, Dysseisdorp, Leeu Gamka, Nuwerus, Touwsrivier and Murraysburg. The only coastal settlement in this category is Arniston, with a comparatively large proportion of its community unemployed (21%) and with relatively low education levels (only 23.6% of 20 - 65 year olds have grade 12 or higher qualifications).

Table 12 Indicators considered in the Human Capital Index

#	Indicator name	Municipal level	Settlement level
1	Average per capita income 2011 (Rands) [+]	●	●
2	% change in economic empowerment 2001 - 2011 [+]	●	●
3	% Unemployment 2011 [-]	●	●
4	Human Development Index 2005 [+]	●	○
5	Matric pass rate 2012 (%) [+]	●	●
6	% 20 - 65 year olds with at least grade 12 and higher [+]	●	●
7	Ratio non-economically active population age 2011 [-]	●	●

[+] and [-] indicates whether an indicator had a positive or negative influence on the index respectively
 ● and ○ indicates whether an indicator was respectively included or excluded at a particular level

Table 13 Human Capital Index classification for settlements and municipalities

		Municipality level classification (the municipality of each settlement is shown in parenthesis)				
		Very low	Low	Medium	High	Very high
Settlement level classification (the municipality of each settlement is shown in parenthesis)	Very low		De Rust (Oudtshoorn) Dysselsdorp (Oudtshoorn) Leeu Gamka (Prince Albert) Murraysburg (Beaufort West)	Amiston (Cape Agulhas) Nuwerus (Matzikama) Touwsrivier (Breede Valley)		
	Low	Calitzdorp (Kannaland) Zoar (Kannaland)	Ashton (Langeberg) Beaufort West (Beaufort West) Matjiesfontein (Laingsburg) Merweville (Beaufort West) Prince Albert (Prince Albert)	Bitterfontein (Matzikama) Doringbaai (Matzikama) Genadendal (Theewaterskloof) Rietpoort (Matzikama) Riversonderend (Theewaterskloof) Wolseley (Witzenberg)	Slangrivier (Hessequa) St Helena Bay (Saldanha Bay) Wellington (Drakenstein)	Franschhoek (Stellenbosch) Friemersheim (Mosselbaai) Haarlem (George) Klapmuts (Stellenbosch)
	Medium		Citrusdal (Cederberg) Clanwilliam (Cederberg) Elandsbaai (Cederberg) Laingsburg (Laingsburg) Lamberts Bay (Cederberg) McGregor (Langeberg) Oudtshoorn (Oudtshoorn) Robertson (Langeberg)	Aurora (Bergrivier) Botrivier (Theewaterskloof) Bredasdorp (Cape Agulhas) Caledon (Theewaterskloof) Ceres (Witzenberg) De Doorns (Breede Valley) Eendekuil (Bergrivier) Goedverwacht (Bergrivier) Grabouw (Theewaterskloof) Greyton (Theewaterskloof) Kliprand (Matzikama) Koekenaap (Matzikama) Lutzville (Matzikama) Op-die-Berg (Witzenberg) Prince Alfred Hamlet (Witzenberg) Strandfontein (Matzikama) Suurbraak (Swellendam) Tulbagh (Witzenberg) Vanrhynsdorp (Matzikama) Vredendal (Matzikama) Worcester (Breede Valley)	Albertinia (Hessequa) Darling (Swartland) Gouda (Drakenstein) Heidelberg (Hessequa) Hopefield (Saldanha Bay) Kurland (Bitou) Malmesbury (Swartland) Plettenberg Bay/Kranshoek/Wittedrif /Keurboomsrivier (Bitou) Rheenendal (Knysna) Riversdale (Hessequa) Saldanha/Jacobsbaai (Saldanha Bay) Saron (Drakenstein) Vredenburg (Saldanha Bay)	Gansbaai/Franskralstrand (Overstrand) Herbertsdale (Mosselbaai) Kleinmond (Overstrand) Mosselbaai/Groot Brak (Mosselbaai) Pearly Beach (Overstrand) Pniel/Kylemore (Stellenbosch) Stanford (Overstrand) Uniondale (George)
	High	Ladismith (Kannaland)	Bonnievale (Langeberg) Graafwater (Cederberg) Montagu (Langeberg) Volmoed (Oudtshoorn)	Barrydale (Swellendam) Dwarskersbos (Bergrivier) Ebenhaesar (Matzikama) Elim (Cape Agulhas) Klawer (Matzikama) Napier (Cape Agulhas) Piketberg (Bergrivier) Rawsonville (Breede Valley) Redelinghuys (Bergrivier) Struisbaai (Cape Agulhas) Swellendam (Swellendam) Velddrift (Bergrivier) Villiersdorp (Theewaterskloof)	Kalbaskraal (Swartland) Koringberg (Swartland) Mooreesburg (Swartland) Paarl (Drakenstein) Paternoster (Saldanha Bay) Riebeek-Kasteel/Riebeek-Wes (Swartland)	George/Heroldsbaai (George) Hermanus/Onrus/Hawston (Overstrand) Stellenbosch/Jamestown (Stellenbosch)
	Very high			Porterville (Bergrivier)	Buffelsbaai (Knysna) Gouritsmond (Hessequa) Jongensfontein (Hessequa) Knysna/Brenton-on-sea (Knysna) Langebaan (Saldanha Bay) Nature's Valley (Bitou) Sedgefield (Knysna) Stilbaai (Hessequa) Witsand (Hessequa) Yzerfontein (Swartland)	Betty's Bay/Pringle Bay (Overstrand) Wilderness (George)

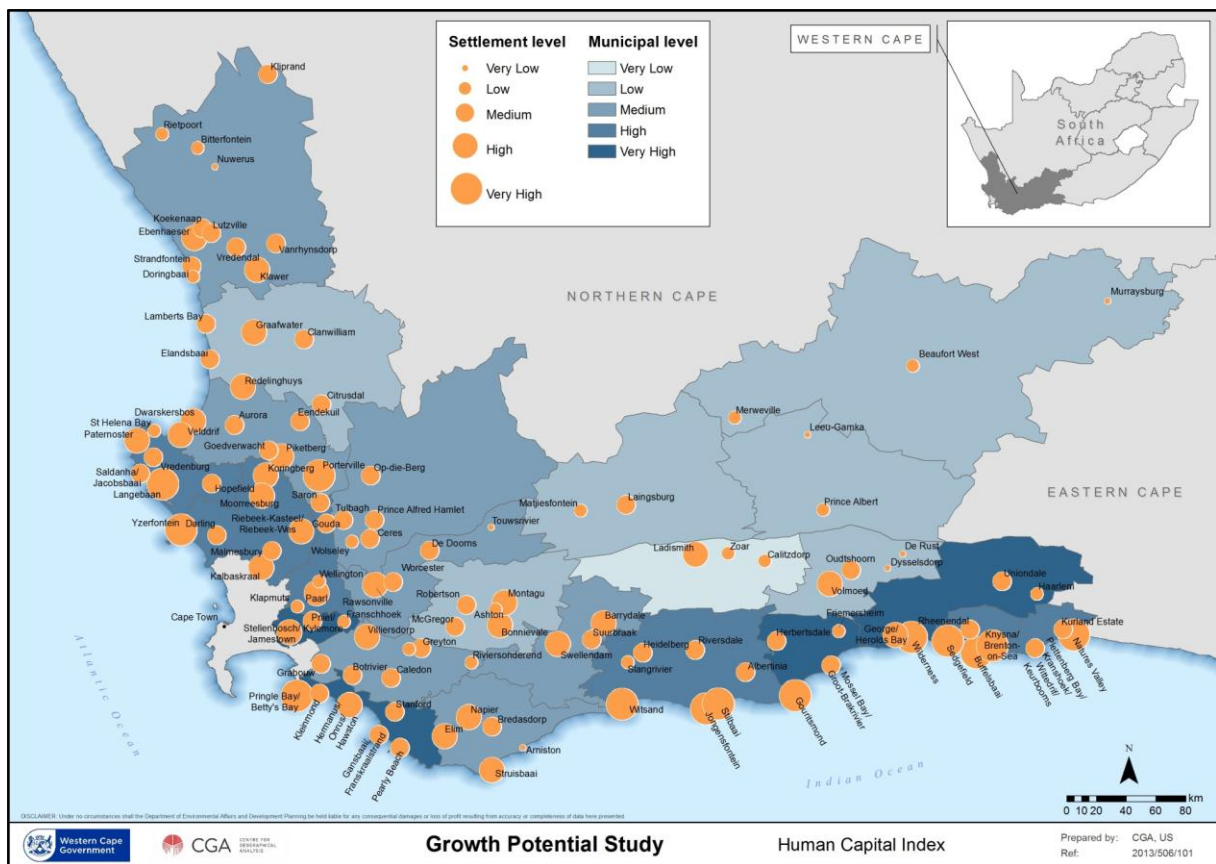


Figure 13 Human Capital Index at settlement and municipal level

4.3.2 Economic

A total of fourteen indicators were considered in the *Economic Index* (Table 14). The quantitative analysis revealed that Paarl, George, Stellenbosch and Worcester have the strongest economic resource base, scoring very high in the *Economic Index* (Table 15). The municipalities within which these settlements are located are also classified as having a high or very high value on the economic index. A total of 19 settlements received a very low classification in this index. Examples include Aurora, Bitterfontein, Doringbaai and Dwarskersbos. From these results it is clear that smaller settlements generally performed poorly in the *Economic Index*, while the leader towns received higher scores.

Figure 14 shows that there are two main clusters of settlements with high values in the *Economic Index*. The first cluster is in the Cape Winelands region, while the second cluster is in the Garden Route area.

Table 14 Indicators considered in the Economic Index

#	Indicator name	Municipal level	Settlement level
1	Average per capita income 2011 (Rands) [+]	●	●
2	Tourism potential 2008 [+]	●	●
3	% Growth of economically active population 2001 - 2011 [+]	●	●
4	Gross Value Added 2011 (current prices R million) [+]	●	○
5	Medium term annual % GVA growth 2001 to 2011 [+]	●	○
6	Diversity of economic activities (2011) [+]	●	○
7	Change in diversity index (2001-2011) [+]	●	○
8	Distance to Port Elizabeth, Cape Town and 6 leader towns [-]	●	●
9	Total personal income 2011 (Rands million) [+]	●	●
10	% Growth in highly skilled labour 2001 - 2011 [+]	●	●
11	Value of property transactions 2010 [+]	●	●
12	Property tax revenue 2010 [-]	●	●
13	Number of formal retail outlets and service sector businesses 2010 [+]	●	●
14	Number of formal retail outlets and service sector businesses per person 2010 [+]	●	○

[+] and [-] indicates whether an indicator had a positive or negative influence on the index respectively
 ● and ○ indicates whether an indicator was respectively included or excluded at a particular level

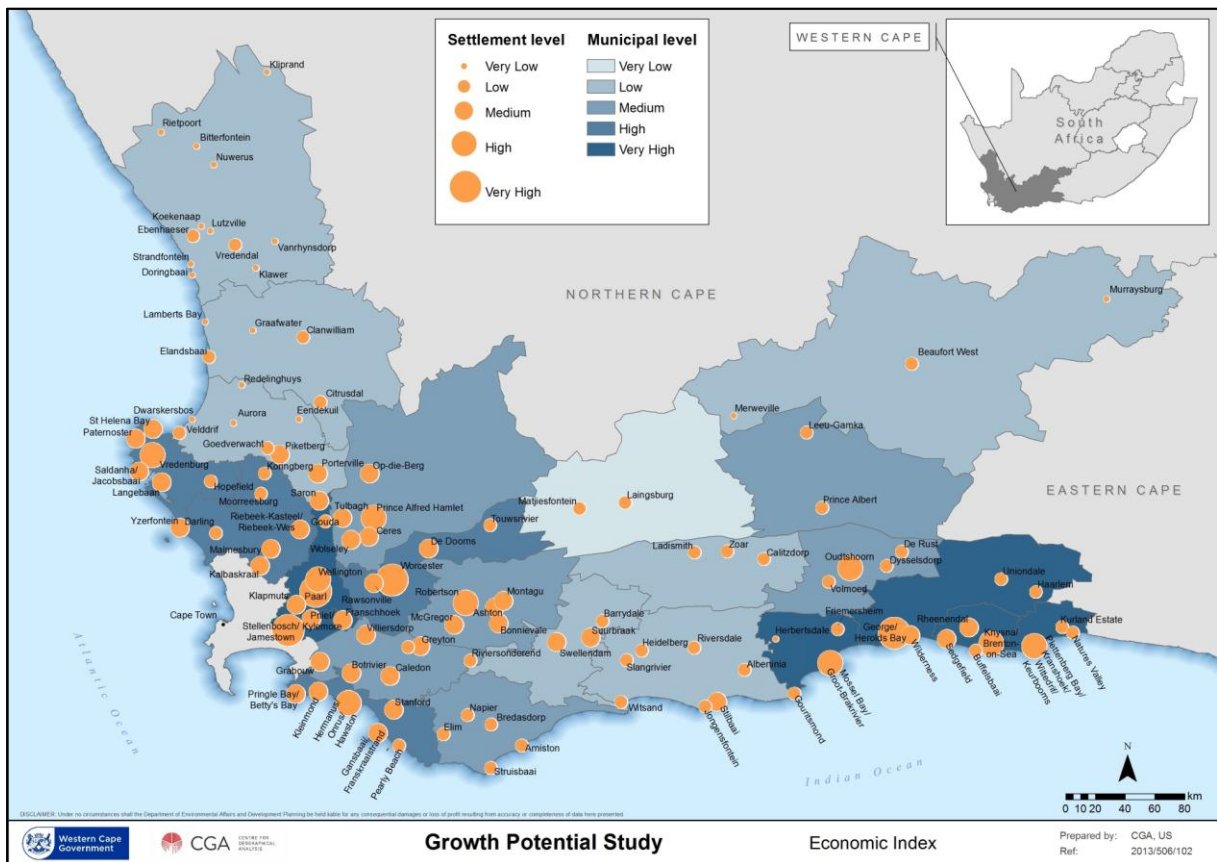


Figure 14 Spatial representation of the Economic Index at settlement and municipal level

Table 15 Economic Index classification for settlements and municipalities

		Municipality level classification (the municipality of each settlement is shown in parenthesis)					
		Very low	Low	Medium	High	Very high	
Settlement level classification (the municipality of each settlement is shown in parenthesis)	Very low		Aurora (Bergrivier) Bitterfontein (Matzikama) Doringbaai (Matzikama) Dwarskersbos (Bergrivier) Eendekuil (Bergrivier) Graafwater (Cederberg) Klawer (Matzikama) Kliprand (Matzikama) Koekenaap (Matzikama) Lamberts Bay (Cederberg) Lutzville (Matzikama) Merweville (Beaufort West) Murraysburg (Beaufort West) Nuwerus (Matzikama) Redelinghuys (Bergrivier) Rietpoort (Matzikama) Strandfontein (Matzikama) Vanrhynsdorp (Matzikama)				Herbertsdale (Mosselbaai)
	Low	Laingsburg (Laingsburg) Matjiesfontein (Laingsburg)	Albertinia (Hessequa) Barydale (Swellendam) Beaufort West (Beaufort West) Calitzdorp (Kannaland) Citrusdal (Cederberg) Clanwilliam (Cederberg) Ebenhaeser (Matzikama) Elandsbaai (Cederberg) Goedverwacht (Bergrivier) Gouritsmond (Hessequa) Jongensfontein (Hessequa) Heidelberg (Hessequa) Ladismith (Kannaland) Riversdale (Hessequa) Slangrivier (Hessequa) Veldrift (Bergrivier) Vredendal (Matzikama) Witsand (Hessequa) Zoar (Kannaland)	Arniston (Cape Agulhas) Bredasdorp (Cape Agulhas) De Rust (Oudtshoorn) Dysseldorp (Oudtshoorn) Elim (Cape Agulhas) Genadendal (Theewaterskloof) Leeu Gamka (Prince Albert) Napier (Cape Agulhas) Prince Albert (Prince Albert) Riviersonderend (Theewaterskloof) Struisbaai (Cape Agulhas) Volmoed (Oudtshoorn)	Darling (Swartland) Hopefield (Saldanha Bay) Koringberg (Swartland) Moorreesburg (Swartland) Pearly Beach (Overstrand) Touwsrivier (Breede Valley)	Buffelsbaai (Knysna) Friemersheim (Mosselbaai) Gouda (Drakenstein) Haarlem (George) Kurland (Bitou) Nature's Valley (Bitou) Uniondale (George)	
	Medium	Piketberg (Bergrivier) Porterville (Bergrivier) Stilbaai (Hessequa) Suurbraak (Swellendam) Swellendam (Swellendam)	Ashton (Langeberg) Bonnievale (Langeberg) Botrivier (Theewaterskloof) Caledon (Theewaterskloof) Ceres (Witzenberg) Grabouw (Theewaterskloof) Greyton (Theewaterskloof) McGregor (Langeberg) Montagu (Langeberg) Op-die-Berg (Witzenberg) Tulbagh (Witzenberg) Villiersdorp (Theewaterskloof) Wolseley (Witzenberg)	Betty's Bay/Pringle Bay (Overstrand) De Doorns (Breede Valley) Gansbaai/Franskraalstrand (Overstrand) Kalbaskraal (Swartland) Kleinmond (Overstrand) Langebaan (Saldanha Bay) Malmesbury (Swartland) Paternoster (Saldanha Bay) Rawsonville (Breede Valley) Riebeeck-Kasteel/Riebeeck-Wes (Swartland) Saldanha/Jacobsbaai (Saldanha Bay) St Helena Bay (Saldanha Bay) Stanford (Overstrand) Yzerfontein (Swartland)	Franschhoek (Stellenbosch) Klapmuts (Stellenbosch) Pniel/Kylemore (Stellenbosch) Rheenendal (Knysna) Saron (Drakenstein) Sedgefield (Knysna) Wilderness (George)		
	High		Oudtshoorn (Oudtshoorn) Prince Alfred Hamlet (Witzenberg) Robertson (Langeberg)	Hermanus/Onrus/Hawston (Overstrand) Vredenburg (Saldanha Bay)	Knysna/Brenton-on-sea (Knysna) Mosselbaai/Groot Brak (Mosselbaai) Plettenberg Bay/Kranshoek/Witte drif/Keurboomsrivier (Bitou) Wellington (Drakenstein)		
	Very high				Worcester (Breede Valley)	George/Heroldsbaai (George) Paarl (Drakenstein) Stellenbosch/Jamestown (Stellenbosch)	

4.3.3 Physical index

The *Physical Index* consisted of the nine indicators listed in Table 16. Table 17 shows that none of the settlements that were classified very high in the *Physical Index* (e.g. Caledon, Grabouw and Villiersdorp), are located in municipalities very low or low classifications in this index, indicating that access to natural resources has regional implications and are not limited to individual settlements. It is also clear that many of the settlements located in the drier regions of the province performed poorly in this index. This pattern is also apparent in Figure 15, which shows that almost all of the settlements with high natural resources are located in or near mountain catchment areas.

Table 16 Indicators considered in the Physical Index

#	Indicator name	Municipal level	Settlement level
1	Mean annual precipitation [+]	●	●
2	Projected short term (2020) surplus/shortfalls of peak summer GAADD considering internal reticulation storage 2011 (mcm/a) [+]	●	●
3	Groundwater availability 2011 (mcm/a) [+]	●	●
4	Groundwater quality 2011 [-]	●	●
5	Potential evaporation (mm) [-]	●	●
6	Grazing capacity [+]	●	●
7	% Area cultivated 2012 [+]	●	●
8	Growth in % area cultivated (2007 - 2012) [+]	●	●
9	Size and status of unexploited minerals 2010 [+]	●	●

[+] and [-] indicates whether an indicator had a positive or negative influence on the index respectively
 ● and ○ indicates whether an indicator was respectively included or excluded at a particular level

Table 17 Physical Index classification for settlements and municipalities

		Municipality level classification (the municipality of each settlement is shown in parenthesis)				
		Very low	Low	Medium	High	Very high
Settlement level classification (the municipality of each settlement is shown in parenthesis)	Very low	Beaufort West (Beaufort West) Bitterfontein (Matzikama) Doringbaai (Matzikama) Klawer (Matzikama) Kliprand (Matzikama) Koekenaap (Matzikama) Lutzville (Matzikama) Matjiesfontein (Laingsburg) Murraysburg (Beaufort West) Nuwerus (Matzikama) Rietpoort (Matzikama) Strandfontein (Matzikama) Vredendal (Matzikama)	Lamberts Bay (Cederberg) Touwsrivier (Breede Valley)	Yzerfontein (Swartland)		
	Low	Calitzdorp (Kannaland) Ebenhaesar (Matzikama) Ladismith (Kannaland) Laingsburg (Laingsburg) Merweville (Beaufort West) Oudtshoorn (Oudtshoorn) Vanrhynsdorp (Matzikama) Volmoed (Oudtshoorn) Zoar (Kannaland)	Graafwater (Cederberg) Jongensfontein (Hessequa) Kurland (Bitou) Nature's Valley (Bitou) Prince Albert (Prince Albert) Slangrivier (Hessequa)	Darling (Swartland) Langebaan (Saldanha Bay) Redelinghuys (Bergrivier) Saldanha/Jacobsbaai (Saldanha Bay)		
	Medium	De Rust (Oudtshoorn) Dysselsdorp (Oudtshoorn)	Albertinia (Hessequa) Clanwilliam (Cederberg) Elandsbaai (Cederberg) Gouritsmond (Hessequa) Heidelberg (Hessequa) Leeu Gamka (Prince Albert) Stilbaai (Hessequa) Witsand (Hessequa) Worcester (Breede Valley)	Arniston (Cape Agulhas) Aurora (Bergrivier) Betty's Bay/Pringle Bay (Overstrand) Bredasdorp (Cape Agulhas) Dwarskersbos (Bergrivier) Elim (Cape Agulhas) Goedverwacht (Bergrivier) Hermanus/Onrus/Hawston (Overstrand) Hopefield (Saldanha Bay) Moorreesburg (Swartland) Mosselbaai/Groot Brak (Mosselbaai) Patemoster (Saldanha Bay) Pearly Beach (Overstrand) Piketberg (Bergrivier) St Helena Bay (Saldanha Bay) Stanford (Overstrand) Stellenbosch/Jamestown (Stellenbosch) Struisbaai (Cape Agulhas) Velldriff (Bergrivier) Vredenburg (Saldanha Bay) Wolseley (Witzenberg)	Ashton (Langeberg) Barydale (Swellendam) Bonnievale (Langeberg) Haarlem (George) Robertson (Langeberg) Uniondale (George)	Buffelsbaai (Knysna) Wellington (Drakenstein)
	High		Citrusdal (Cederberg) De Doorns (Breede Valley) Plettenberg Bay/Kranshoek/Witdrif/Keurboomsvier (Bitou) Rawsonville (Breede Valley) Riversdale (Hessequa)	Eendekuil (Bergrivier) Gansbaai/Franskraalstrand (Overstrand) Herbertsdale (Mosselbaai) Klapmuts (Stellenbosch) Kleinmond (Overstrand) Koringberg (Swartland) Napier (Cape Agulhas) Op-die-Berg (Witzenberg) Tulbagh (Witzenberg)	George/Heroldsbaai (George) McGregor (Langeberg) Montagu (Langeberg) Suurbrak (Swellendam) Wilderness (George)	Botrivier (Theewaterskloof) Gouda (Drakenstein) Knysna/Brenton-on-sea (Knysna) Paarl (Drakenstein) Riviersonderend (Theewaterskloof)
	Very high			Ceres (Witzenberg) Franschoek (Stellenbosch) Friemersheim (Mosselbaai) Kalbaskraal (Swartland) Malmesbury (Swartland) Pniel/Kylemore (Stellenbosch) Porterville (Bergrivier) Prince Alfred Hamlet (Witzenberg) Riebeeck-Kasteel/Riebeeck-Wes (Swartland)	Swellendam (Swellendam)	Caledon (Theewaterskloof) Genadendal (Theewaterskloof) Grabouw (Theewaterskloof) Greyton (Theewaterskloof) Rheenedal (Knysna) Saron (Drakenstein) Sedgefield (Knysna) Villiersdorp (Theewaterskloof)

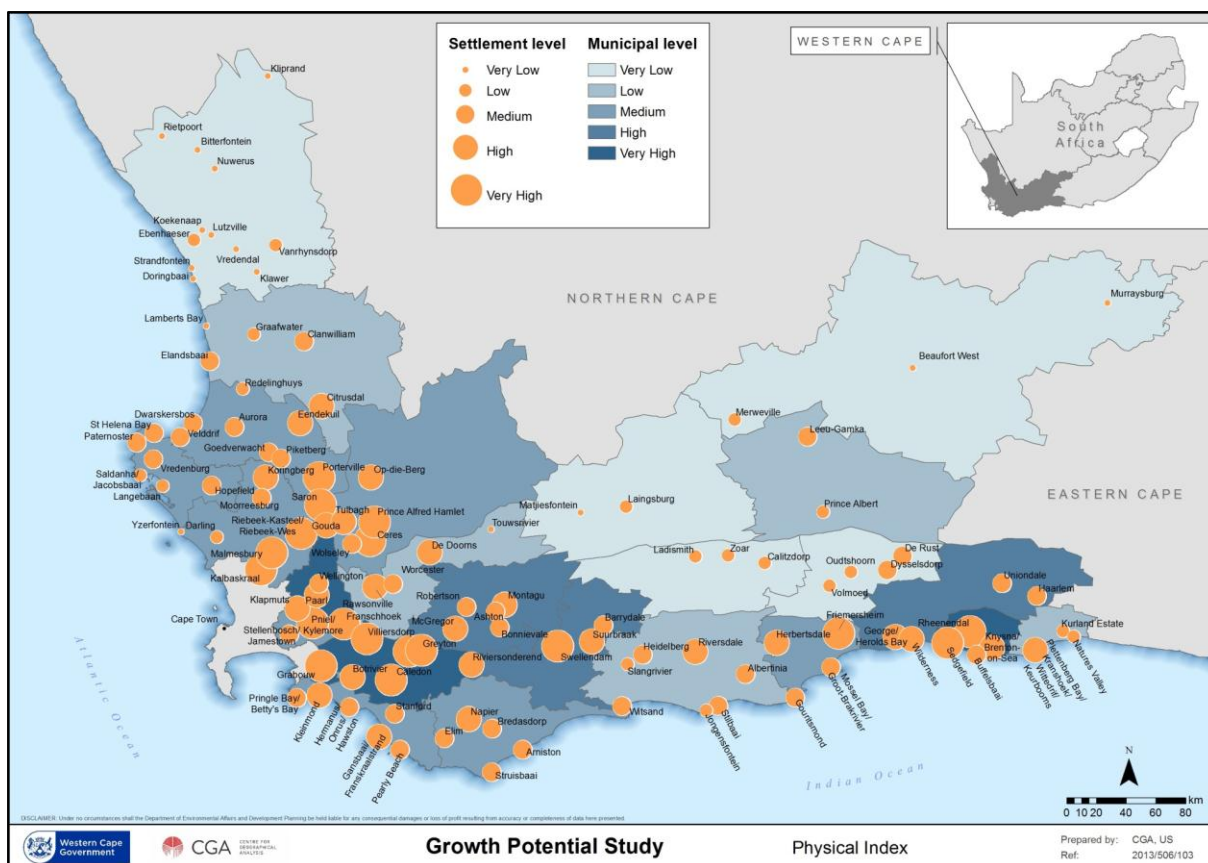


Figure 15 Spatial representation of the Physical Index at settlement and municipal level

4.3.4 Infrastructure

The *Infrastructure Index* consists of fourteen indicators (Table 18). Most of the indicators measure access to municipal services and transport infrastructure. The resulting classification (Table 19) shows that there is a strong relationship between the municipal and settlement level results. The settlements located in the Overstrand, Stellenbosch, Drakenstein, Mosselbaai and Saldanha Bay municipalities generally performed well. There are however also some notable exceptions such as Herbertsdale (Mosselbaai) and Pearly Beach (Overstrand), which were classified as having poor (classified low) infrastructure in spite of being located in municipalities that were classified in the very high category. Kliprand (Matzikama), Rietpoort (Matzikama) and Murraysburg (Beaufort West) were rated as having very low access to infrastructure. Settlements and municipalities located in the south-western parts of the province generally performed better in this index (Figure 16).

Table 18 Indicators considered in the Infrastructure Index

#	Indicator name	Municipal level	Settlement level
1	% households with access to the Internet 2011 [+]	●	●
2	Distance to nearest scheduled airport [-]	●	●
3	Distance to nearest commercial harbour [-]	●	●
4	Distance to nearest small harbour and slipways [-]	●	●
5	Access to main and national roads [+]	●	●
6	Access to railways [+]	●	●
7	% households with access to cellphone 2011 [+]	●	●
8	% households with access to sanitation (flush) 2011 [+]	●	●
9	% households with access to water (in house) 2011 [+]	●	●
10	% households with access to electricity (lighting) 2011 [+]	●	●
11	% households with access to waste removal 2011 [+]	●	●
12	WWTW spare capacity per person 2011 (l/day/pop) [+]	●	●
13	State of WWTW infrastructure 2011 [+]	●	●
14	% households with access to the Internet 2011 [+]	●	●

[+] and [-] indicates whether an indicator had a positive or negative influence on the index respectively
 ● and ○ indicates whether an indicator was respectively included or excluded at a particular level

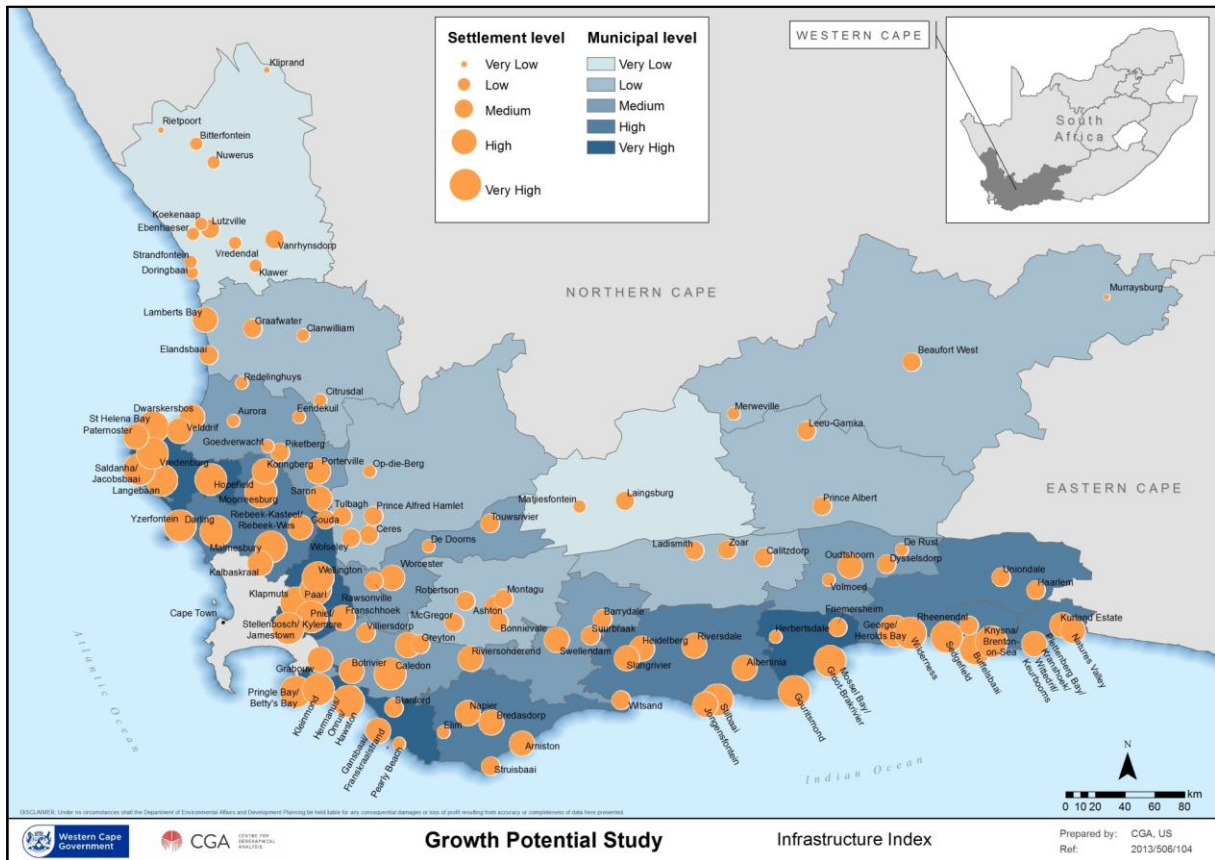


Figure 16 Spatial representation of the Infrastructure Index at settlement and municipal level

Table 19 Infrastructure Index classification for settlements and municipalities

		Municipality level classification (the municipality of each settlement is shown in parenthesis)				
		Very low	Low	Medium	High	Very high
Settlement level classification (the municipality of each settlement is shown in parenthesis)	Very low	Kliprand (Matzikama) Rietpoort (Matzikama)	Murraysburg (Beaufort West)			
	Low	Bitterfontein (Matzikama) Doringbaai (Matzikama) Ebenhaesar (Matzikama) Klaver (Matzikama) Koekenaap (Matzikama) Matjiesfontein (Laingsburg) Nuwerus (Matzikama) Strandfontein (Matzikama) Vredendal (Matzikama)	Citrusdal (Cederberg) Clanwilliam (Cederberg) Merweville (Beaufort West) Op-die-Berg (Witzenberg)	Aurora (Bergrivier) De Doorns (Breede Valley) De Rust (Oudtshoorn) Eendekuil (Bergrivier) Goedverwacht (Bergrivier) Redelinghuys (Bergrivier) Volmoed (Oudtshoorn)	Elim (Cape Agulhas)	Herbertsdale (Mosselbaai) Pearly Beach (Overstrand)
	Medium	Laingsburg (Laingsburg) Lutzville (Matzikama) Vanrhynsdorp (Matzikama)	Ashton (Langeberg) Beaufort West (Beaufort West) Bonnievale (Langeberg) Calitzdorp (Kannaland) Ceres (Witzenberg) Elandsbaai (Cederberg) Graafwater (Cederberg) Ladismith (Kannaland) Leeu Gamka (Prince Albert) McGregor (Langeberg) Montagu (Langeberg) Prince Albert (Prince Albert) Prince Alfred Hamlet (Witzenberg) Robertson (Langeberg) Tulbagh (Witzenberg) Wolseley (Witzenberg) Zoar (Kannaland)	Barrydale (Swellendam) Dysselsdorp (Oudtshoorn) Greyton (Theewaterskloof) Piketberg (Bergrivier) Rawsonville (Breede Valley) Suurbraak (Swellendam) Touwsrivier (Breede Valley) Villiersdorp (Theewaterskloof)	Haarlem (George) Rheenendal (Knysna) Struisbaai (Cape Agulhas) Uniondale (George) Witsand (Hessequa)	Friemersheim (Mosselbaai) Gouda (Drakenstein) Stanford (Overstrand)
	High		Lamberts Bay (Cederberg)	Botrivier (Theewaterskloof) Dwarskersbos (Bergrivier) Genadendal (Theewaterskloof) Grabouw (Theewaterskloof) Oudtshoorn (Oudtshoorn) Porterville (Bergrivier) Riviersonderend (Theewaterskloof) Swellendam (Swellendam) Velddrift (Bergrivier) Worcester (Breede Valley)	Albertinia (Hessequa) Arniston (Cape Agulhas) Bredasdorp (Cape Agulhas) Jongensfontein (Hessequa) Heidelberg (Hessequa) Kalbaskraal (Swartland) Koringberg (Swartland) Kurland (Bitou) Napier (Cape Agulhas) Nature's Valley (Bitou) Plettenberg Bay/Kranshoek/Wittedrif/Keurboomsrivier (Bitou) Riebeek-Kasteel/Riebeek-Wes (Swartland) Riversdale (Hessequa) Slangrivier (Hessequa)	Franschhoek (Stellenbosch) Gansbaai/Franskraalstrand (Overstrand) Paternoster (Saldanha Bay) Saron (Drakenstein)
	Very high			Caledon (Theewaterskloof)	Buffelsbaai (Knysna) Darling (Swartland) George/Heroldsbaai (George) Gouritsmond (Hessequa) Knysna/Brenton-on-sea (Knysna) Malmesbury (Swartland) Moorreesburg (Swartland) Sedgefield (Knysna) Stilbaai (Hessequa) Wilderness (George) Yzerfontein (Swartland)	Betty's Bay/Pringle Bay (Overstrand) Hermanus/Onrus/Hawston (Overstrand) Hopefield (Saldanha Bay) Klapmuts (Stellenbosch) Kleinmond (Overstrand) Langebaan (Saldanha Bay) Mosselbaai/Groot Brak (Mosselbaai) Paarl (Drakenstein) Pniel/Kylemore (Stellenbosch) Saldanha/Jacobsbaai (Saldanha Bay) St Helena Bay (Saldanha Bay) Stellenbosch/Jamestown (Stellenbosch) Vredenburg (Saldanha Bay) Wellington (Drakenstein)

4.3.5 Institutional

As explained in Section 3.2.1, the *Institutional Index* is meant to (in combination with the *Human Capital Index*) represent the innovation potential of a settlement or municipality. Most of the indicators in Table 20 consequently relate to governance (including safety and security) and institutional capacity. Although many of the indicators in this index were only measured at municipal level (e.g. qualified audits, staff per capita ratio, % posts filled), they were also considered at settlement level as it was assumed that the institutional quality at municipal level will also to some extent influence the growth potential of towns. Table 21 shows that (in spite of a number of indicators with similar values at settlement and municipal level), there is a clear distinction between the settlement and municipal level results. For instance, Saldanha and Vredenburg are rated very high at settlement level while the municipality (Saldanha Bay) was rated in the low category. The differentiating factors in these cases were mainly the relatively low crime rates and good institutional support offered in these centres. Other municipalities that performed poorly in this index include Witzenberg, Kannaland, Prince Albert, and Cape Agulhas. In contrast to most of the other thematic indices described in the previous sections, Figure 17 shows that some of the rural areas performed relatively well in the *Institutional Index*. Matzikama and Bergrivier municipalities for example were both classified in the very high category. Cederberg and Beaufort West municipalities also performed well, with the Beaufort West (town) being classified in the very high category. The main factors contributing to the good performance of these rural areas is the relatively low crime rates (e.g. 0.13 cases per year per 100 000 population in Beaufort West).

Table 20 Indicators considered in the Institutional Index

#	Indicator name	Municipal level	Settlement level
1	Management experience and capacity 2010 [+]	●	●
2	Qualified audits 2012 [+]	●	●
3	Infrastructure backlog reduction 2010 [+]	●	●
4	Staff per cap ratio 2010 [-]	●	●
5	% Posts filled 2010 [+]	●	●
6	% Crime (all) occurrences change 2009 - 2012 [-]	●	●
7	Crime (all) occurrences (09 - 12) per 100 000 population [-]	●	●
8	Small business support 2010 [+]	○	●
9	Voter turnout 2010 [+]	●	○
10	Amenities 2010 [+]	●	●
11	Social service organisations 2010 [+]	●	●

[+] and [-] indicates whether an indicator had a positive or negative influence on the index respectively
 ● and ○ indicates whether an indicator was respectively included or excluded at a particular level

Table 21 Institutional Index classification for settlements and municipalities

		Municipality level classification (the municipality of each settlement is shown in parenthesis)				
		Very low	Low	Medium	High	Very high
Settlement level classification (the municipality of each settlement is shown in parenthesis)	Very low	Calitzdorp (Kannaland) Ceres (Witzenberg) Ladismith (Kannaland) Leeu Gamka (Prince Albert) Op-die-Berg (Witzenberg) Prince Albert (Prince Albert) Prince Alfred Hamlet (Witzenberg) Tulbagh (Witzenberg) Wolseley (Witzenberg) Zoar (Kannaland)	De Rust (Oudtshoorn) Volmoed (Oudtshoorn)		Witsand (Hessequa)	
	Low	Elim (Cape Agulhas) Napier (Cape Agulhas) Struisbaai (Cape Agulhas)	Dysselsdorp (Oudtshoorn) Klapmuts (Stellenbosch) Matjiesfontein (Laingsburg) Riviersonderend (Theewaterskloof) Suurbraak (Swellendam) Swellendam (Swellendam)		Albertinia (Hessequa) De Doorns (Breede Valley) Gouda (Drakenstein) Gouritsmond (Hessequa) Jongensfontein (Hessequa) Haarlem (George) Saron (Drakenstein) Slangrivier (Hessequa) Touwsrivier (Breede Valley) Uniondale (George) Wilderness (George)	Buffelsbaai (Knysna) Friemersheim (Mosselbaai) Herbertsdale (Mosselbaai) Rheenendal (Knysna) Sedgefield (Knysna)
	Medium	Arniston (Cape Agulhas) Bredasdorp (Cape Agulhas) Hopefield (Saldanha Bay) Langebaan (Saldanha Bay) Paternoster (Saldanha Bay) St Helena Bay (Saldanha Bay)	Ashton (Langeberg) Barrydale (Swellendam) Bonnievale (Langeberg) Botrivier (Theewaterskloof) Caledon (Theewaterskloof) Franschhoek (Stellenbosch) Greyton (Theewaterskloof) Laingsburg (Laingsburg) Pniel/Kylemore (Stellenbosch) Villiersdorp (Theewaterskloof)		Graafwater (Cederberg) Heidelberg (Hessequa) Merweville (Beaufort West) Pearly Beach (Overstrand) Rawsonville (Breede Valley) Riversdale (Hessequa) Stilbaai (Hessequa) Wellington (Drakenstein)	Klawer (Matzikama) Kliprand (Matzikama) Kurland (Bitou) Nature's Valley (Bitou)
	High		Genadendal (Theewaterskloof) Grabouw (Theewaterskloof) McGregor (Langeberg) Montagu (Langeberg) Oudtshoorn (Oudtshoorn) Robertson (Langeberg)		Betty's Bay/Pringle Bay (Overstrand) Citrusdal (Cederberg) Clanwilliam (Cederberg) Darling (Swartland) Elandsbaai (Cederberg) Gansbaai/Franskraalstrand (Overstrand) Kalbaskraal (Swartland) Kleinmond (Overstrand) Koringberg (Swartland) Lamberts Bay (Cederberg) Malmesbury (Swartland) Moorreesburg (Swartland) Murraysburg (Beaufort West) Stanford (Overstrand) Worcester (Breede Valley) Yzerfontein (Swartland)	Aurora (Bergrivier) Bitterfontein (Matzikama) Doringbaai (Matzikama) Dwarskersbos (Bergrivier) Ebenhaesar (Matzikama) Eendekuil (Bergrivier) Goedverwacht (Bergrivier) Koekenaap (Matzikama) Lutzville (Matzikama) Nuwerus (Matzikama) Piketberg (Bergrivier) Plettenberg Bay/Kranshoek/Wittedrif/Keurboomsrivier (Bitou) Porterville (Bergrivier) Redelinghuys (Bergrivier) Rietpoort (Matzikama) Strandfontein (Matzikama) Vanrhynsdorp (Matzikama) Velddrift (Bergrivier) Vredendal (Matzikama)
	Very high	Saldanha/Jacobsbaai (Saldanha Bay) Vredenburg (Saldanha Bay)	Stellenbosch/Jamestown (Stellenbosch)		Beaufort West (Beaufort West) George/Heroldsbaai (George) Hermanus/Onrus/Hawston (Overstrand) Paarl (Drakenstein) Riebeeck-Kasteel/Riebeeck-Wes (Swartland)	Knysna/Brenton-on-sea (Knysna) Mosselbaai/Groot Brak (Mosselbaai)

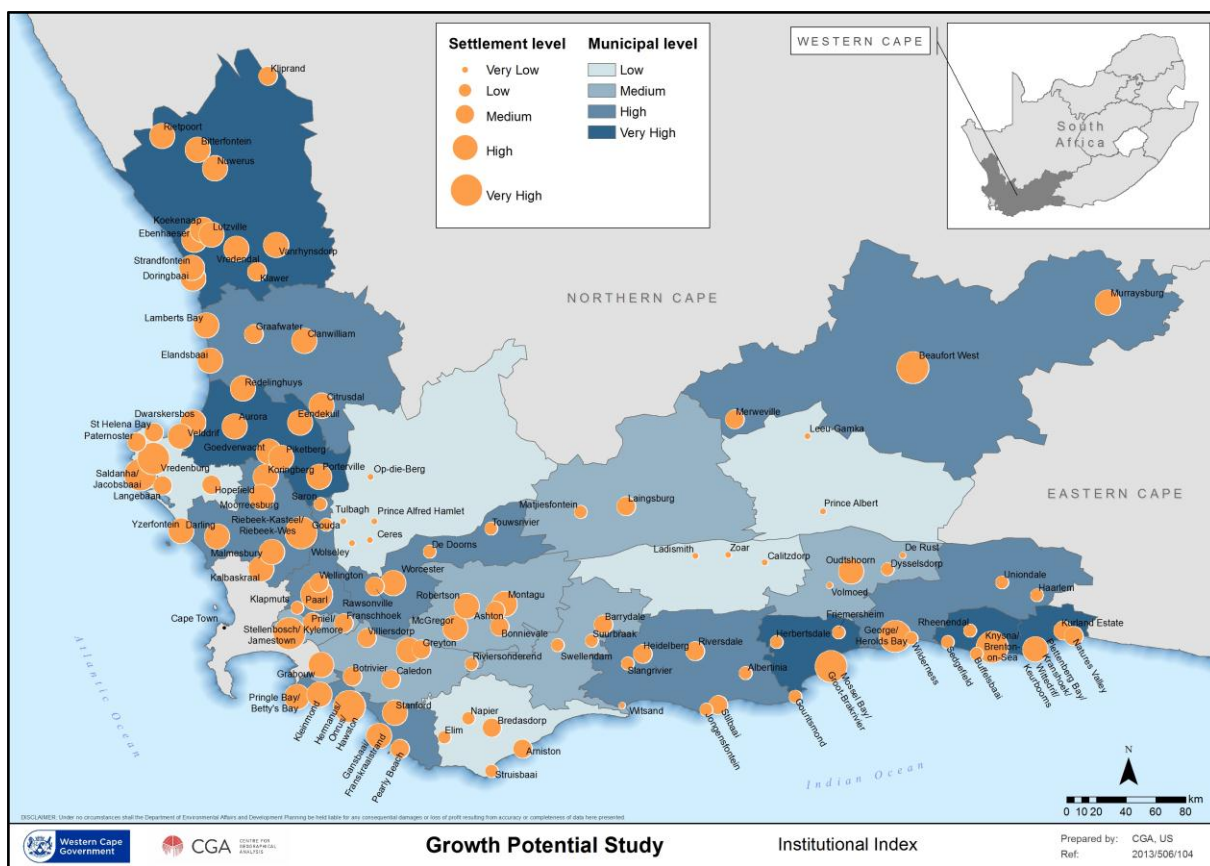


Figure 17 Spatial representation of the Institutional Index at settlement and municipal level

4.4 Indicator bundles

The thematic and composite indices as described above provide an overall perspective of growth potential and socio-economic needs in the Western Cape, with its primary application to inform and guide strategic and cross-cutting decisions at a provincial level (see Table 7). Although these indices offer a practical and useful solution, combining the range of indicators into a summary value also reduces the analytical potential of the original individual indicators. These composite indices are thus not necessarily ideal for more detailed applications such as informing specific programmes within individual departments.

Wong et al (2006) argued that under these circumstances it is more appropriate to identify the key signals or messages that emerge from the analysis of the indicator set. They thus suggest an indicator bundle approach where different indicators within the bundle should be used in conjunction with each other to explain a specific set of circumstances. The aim is thus to obtain robust interpretations of the spatial patterns emerging from the indicator values within the bundle, rather than having a single summary value (Wong, Baker & Kidd 2006: 544). As a further dimension in the range of measuring instruments, the GPS2013 thus also includes "indicator bundles" that can inform decision making relating to specific departmental programmes and objectives. For this purpose the Annual Performance Plans of the respective provincial departments were scrutinised to provide a comparative summary for each department focussing on the following aspects:

- Departmental programmes and sub-programmes
- Strategic objectives
- Performance measure indicators

These programmes and objectives were then evaluated to determine for which departmental programmes and objectives the GPS2013 indicators could be used individually or jointly (as indicator bundles) to provide some spatially targeted guidance to these departmental objectives and programmes. This process considered both the potential use of the composite indices of the GPS2013, as well as the use of the individual indicators that can be used as indicator bundles for specific objectives or programmes. The results of this analysis are available in Appendix D.

Figure 18 provides an illustrative example of the application of bundling four indicators relating to housing needs (Table 22). These results provide a combined view of indicators of potential housing need (percentage of households living in informal housing), the qualitative dimension of housing (level of crowding), and contextual impacting factors such as population growth and migration. Each of these four indicators individually provides robust interpretations of the spatial patterns associated with housing need (see maps I4, I6, I4, and I5 in Appendix E). Figure 18 also illustrates how the four indicators in this indicator bundle can be combined to provide a spatial perspective relating to housing challenges.

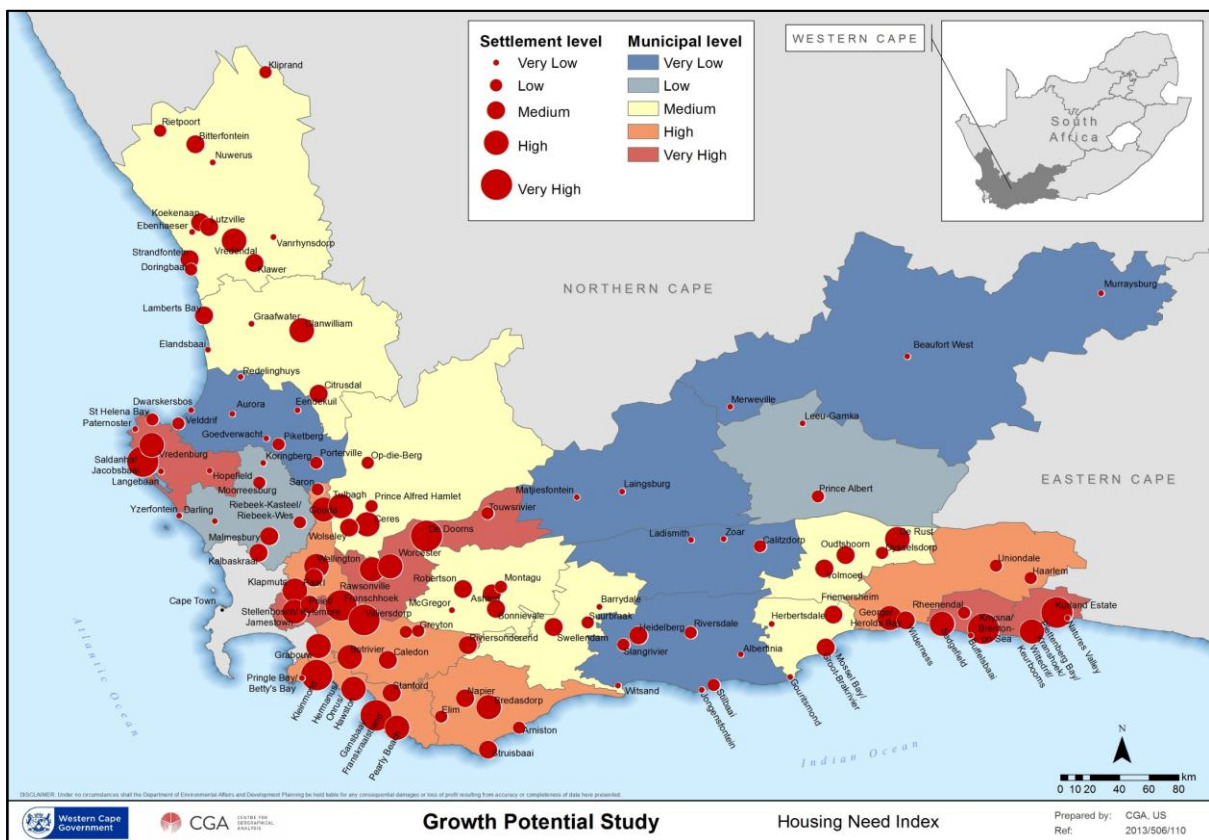


Figure 18 Housing Needs Index

Table 22 Housing-related indicators

#	Indicator name	Municipal level	Settlement level
1	% of households living in informal housing 2011 [+]	●	●
2	Overcrowding 2011 [+]	●	●
3	% Population growth rate 2001 - 2011 [+]	●	●
4	% In-migrants past 10 years 2011 [+]	●	○

[+] and [-] indicates whether an indicator had a positive or negative influence on the index respectively
 ● and ○ indicates whether an indicator was respectively included or excluded at a particular level

Another example of how individual indicators can be bundled to support specific decisions is shown in Figure 19. In this case two indicators, namely % *Crime (all) occurrences change 2009 - 2012* and *Crime (all) occurrences (09 - 12) per 100,000 population*, were used to produce a *Crime Index*. This map illustrates the comparative intensity of crime of settlements expressed relative to the size of its population.

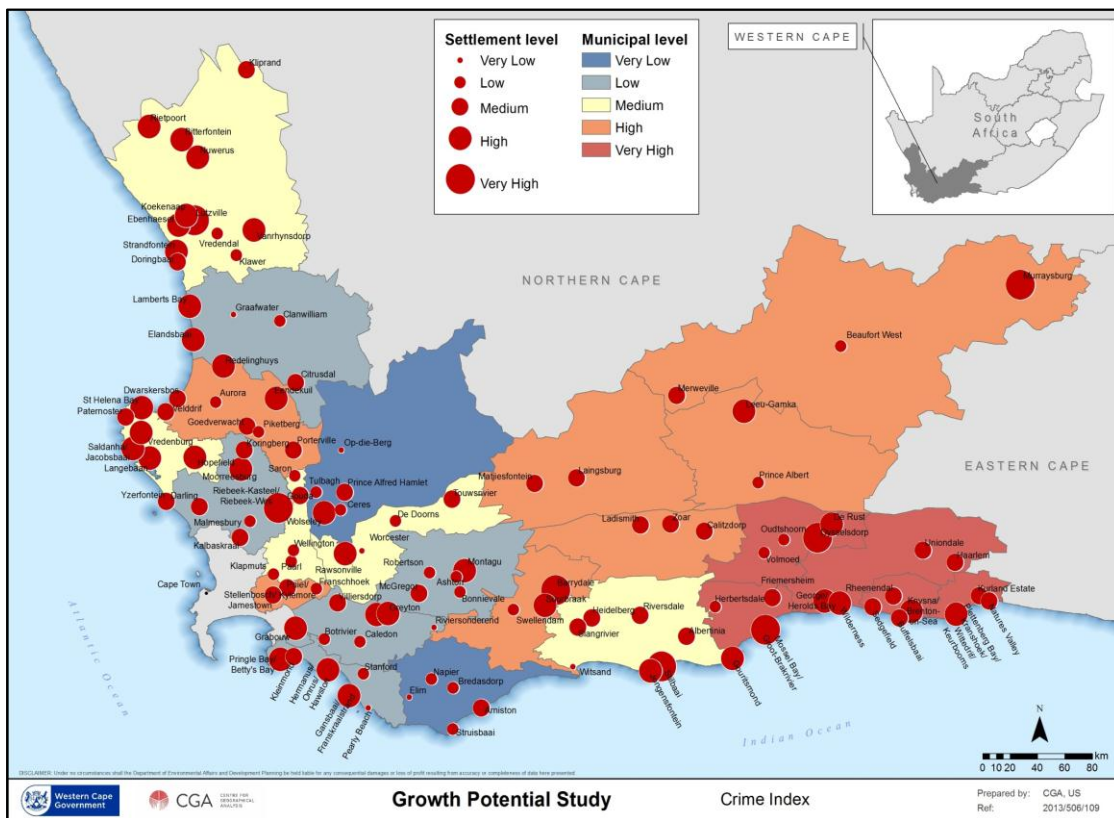


Figure 19 Crime Index

4.5 Individual indicators

The individual GPS2013 indicators can also provide important guidance for specific decision making purposes. For instance, the % *matric pass rate indicator* (Figure 20) may be invaluable in supporting decisions concerned with educational programmes, while *Crime (all) occurrences (09 - 12) per 100 000 population* indicator (Figure 21) can be used to identify areas in the province where safety and security interventions are needed. See Appendix E for a complete list of indicator maps.

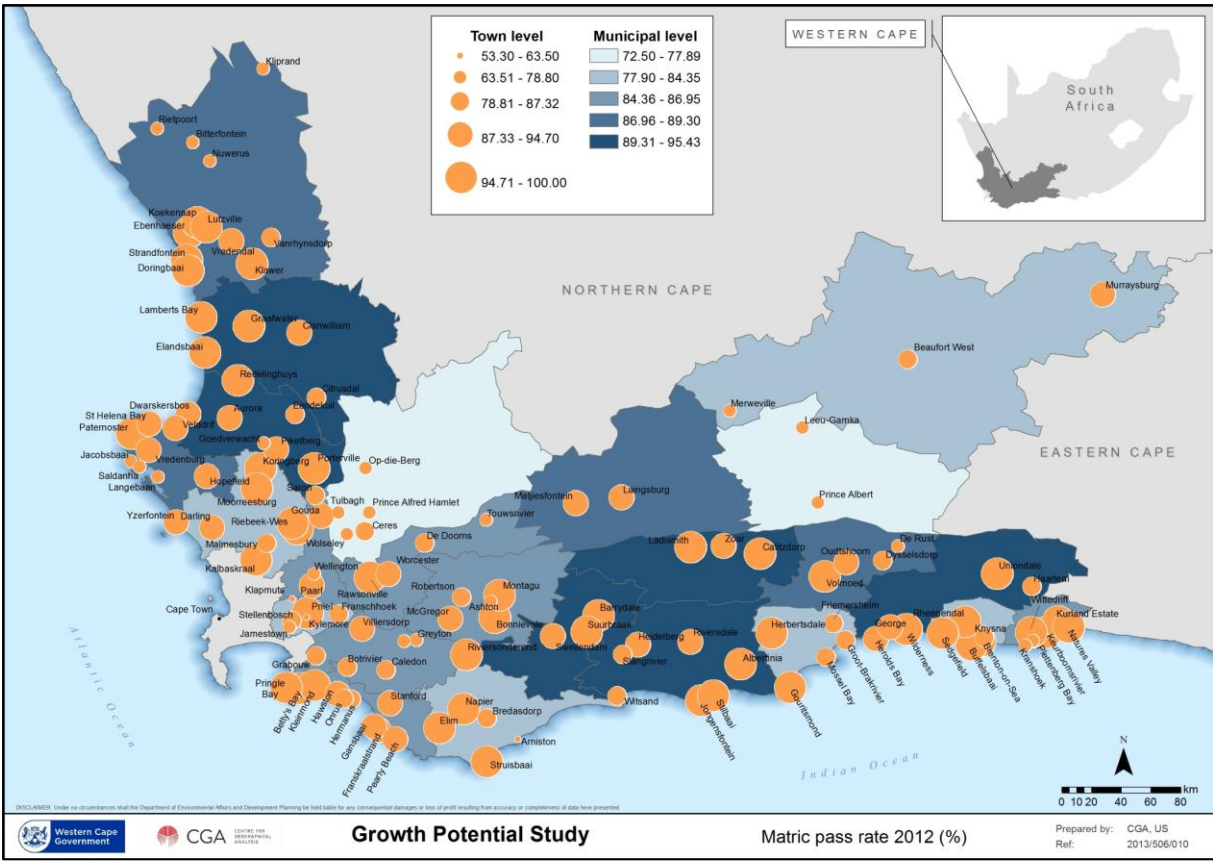


Figure 20 Matric pass rate

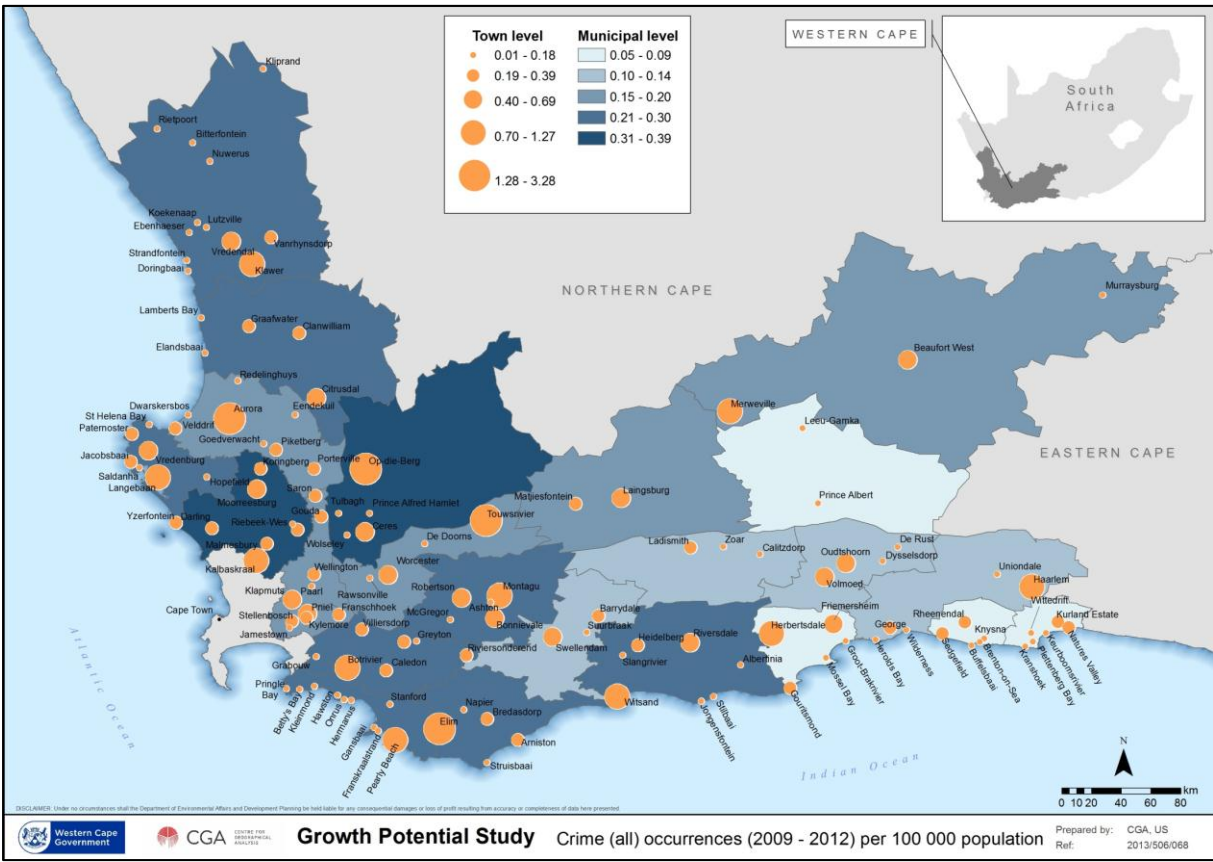


Figure 21 Crime (all) occurrences (09 - 12) per 100 000 population

4.6 Using and interpreting the GPS2013 results with ecological infrastructure data

Not all aspects contributing to growth potential or socio-economic needs can be quantified (e.g. attitude and work ethic of human resources). Some factors may also have both a positive and negative impact on development potential. For example, the inclusion of biodiversity as an indicator for growth potential is challenging as high biodiversity values can have a positive impact on tourism, which can stimulate growth, but can also place a physical and environmental limitation on the growth of a settlement. Prime examples are Betty's Bay and Pringle Bay, which were identified as having a very high growth potential. However, from an environmental perspective there are many constraints to future growth of these settlements as they occur in an area with sensitive wetlands. Existing development is having severe impacts on these wetlands and further expansion into them would not be advisable. Similar unique constraints to urban expansion occur in other settlements. During the analysis process the possibility of including biodiversity indicators (e.g. NBA 2011 Ecosystem Threat Status) as inhibiting factors in the *Physical Index* was considered. However, due to the "compensability" problem in the development of composite indices (as described in Section 3) the inclusion of this indicator (even with the use of a weighting system) only had a limited effect on the overall growth potential. It was thus decided to deliberately exclude this indicator in order to prevent the impression that the growth potential index fully considered all aspects relating to environmental sensitivity. A more appropriate approach is deemed to be the interpretation of the quantitative GPS2013 results in combination with existing environmental data. This is illustrated in Figure 22 where the *Growth Potential Index* results are superimposed onto the NBA 2011 Ecosystem Threat Status data. It must be emphasized that the information reflected in Figure 22 is merely a symbolised representation of various categories of growth potential and in no way resembles the extent of physical expansion envisaged. It is clear from this map that some settlements with a high growth potential are located in sensitive areas and will require careful management of future growth and expansion. The GPS2013 results can and should thus in no way be used to motivate any individual development applications or to circumvent appropriate and efficient environmental authorization processes. All individual development applications (whether located in a town with low or very high potential) remain subject to the normal environmental authorisation processes.

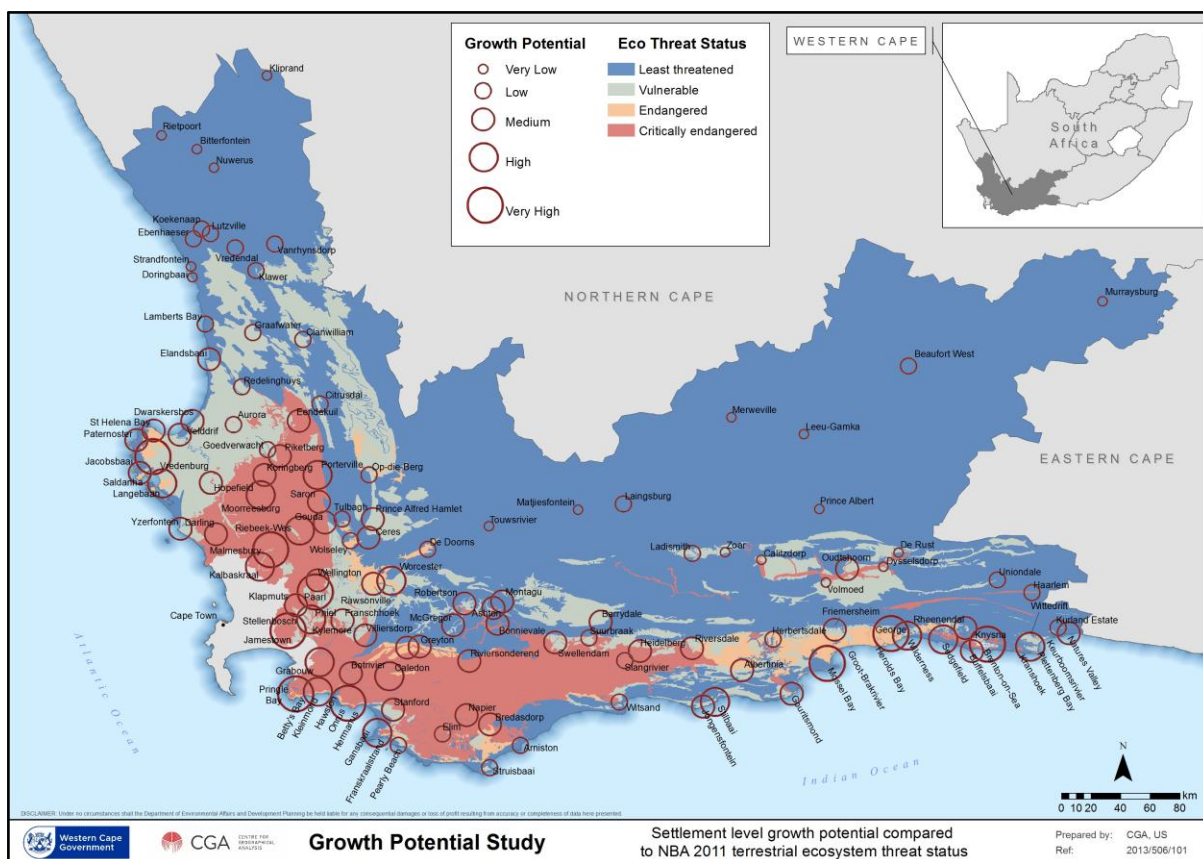


Figure 22 Settlement growth potential compared to ecosystem threat status

5. PROPOSED INTERVENTIONS TO UNLOCK LATENT DEVELOPMENT POTENTIAL

The quantitative analysis described in the previous section made use of a range of indicators and indices to model growth potential. However, all aspects that contribute to growth potential can not necessarily be incorporated in a quantitative analysis as some factors are not measurable (e.g. attitude and work ethic of human resources, potential initiatives and project suggestions not known to state institutions, etc.). The study thus also included a qualitative component to supplement the quantitative analysis and to incorporate aspects that could not be measured in the indices.

The qualitative component of the GPS2013 consisted of two phases: round-table discussions with specific stakeholders, and a broader public-participation process. Key stakeholders were identified and invited to join in these round-table discussions which were conducted within each Functional Region (FR), from 29 March 2012 to 19 April 2012. These stakeholders included local and district municipality officials, NGOs, small-scale farmers and commercial agricultural associations, business chambers, tourism agencies, development agencies, arts and cultural forums, educational institutions, etc. These discussions were a platform for functional regions to start thinking about regional interventions that would unlock latent development potential, and assist or influence the provincial government in making crucial and

informed decisions on where to invest in the future. The round-table discussions were guided by the following questions:

- What development potential in the region and towns has not yet been unlocked?
- What are the main blockages or constraints to unlocking this potential and how do we overcome these?
- Regions should invest in their own growth by mobilising local assets and resources to capitalise on their specific competitive advantages, rather than depending on national transfers and subsidies to help them grow. How, and in what, will your region invest, and how will you convince a private preferred investor to invest in your region, and in what?
- What are the downstream and upstream economic and development linkages?
- How do IDP priorities relate to our identified interventions and strategies?

The expected outcomes of the workshops were as follows:

- Stakeholders were to strive for consensus at the end of the meeting on those specific interventions necessary for stimulating new growth in the region – ideally stakeholders should have identified and prioritise up to five strategies.
- Stakeholders were to provide qualitative arguments in support, or rejection of, the GPS2010's categorisations.

5.1 “Big ideas” to unlock latent development potential in functional regions

It was the main aim of the qualitative component of this the GPS2010 was to identify latent development potential in the province's nine functional regions . Figure 23 to Figure 27 show the big idea initiatives per district municipality. For a discussion on each of the suggested 'big ideas' please see Appendix G.

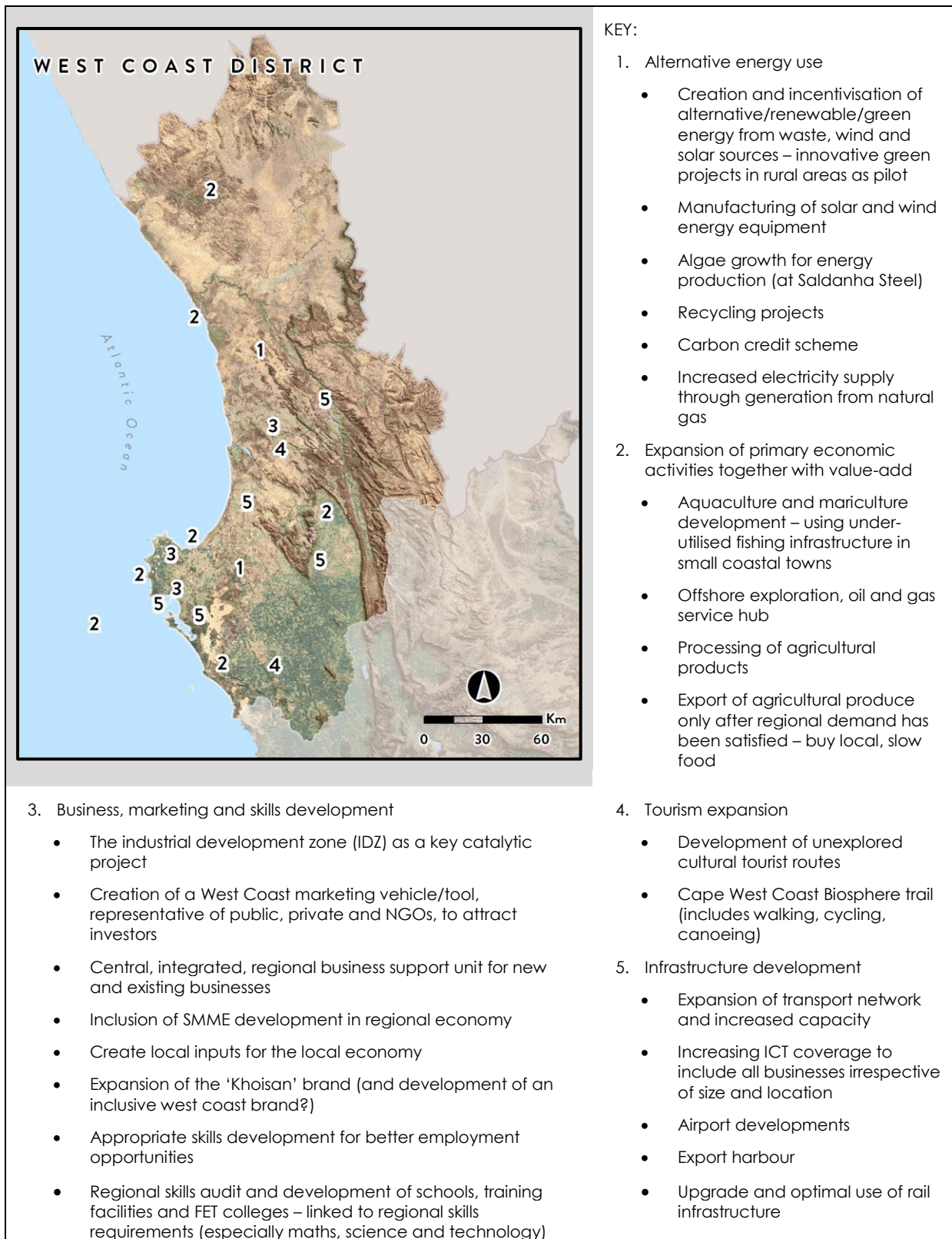


Figure 23 West Coast District Municipality 'big ideas'

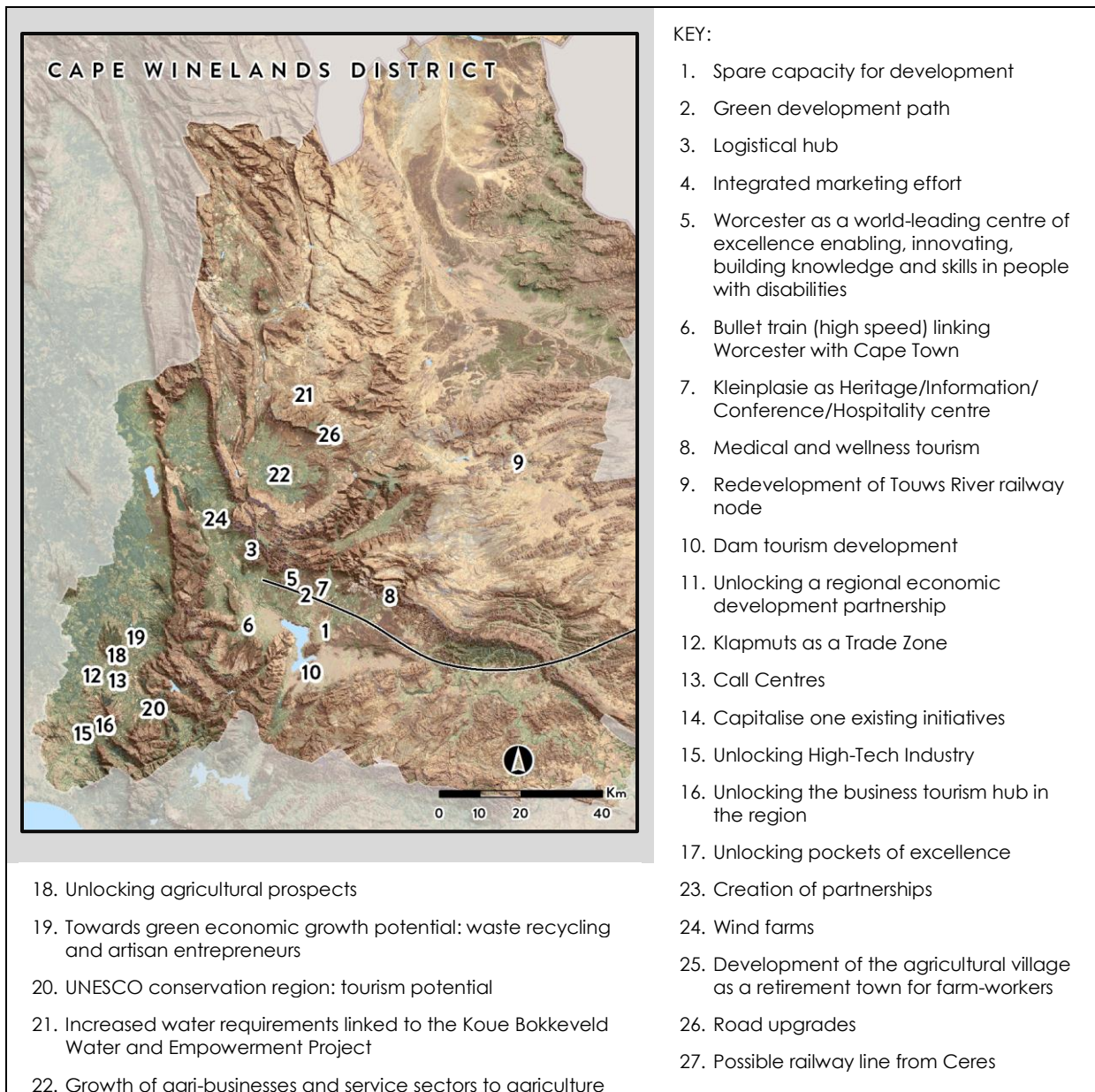


Figure 24 Cape Winelands District Municipality 'big ideas'

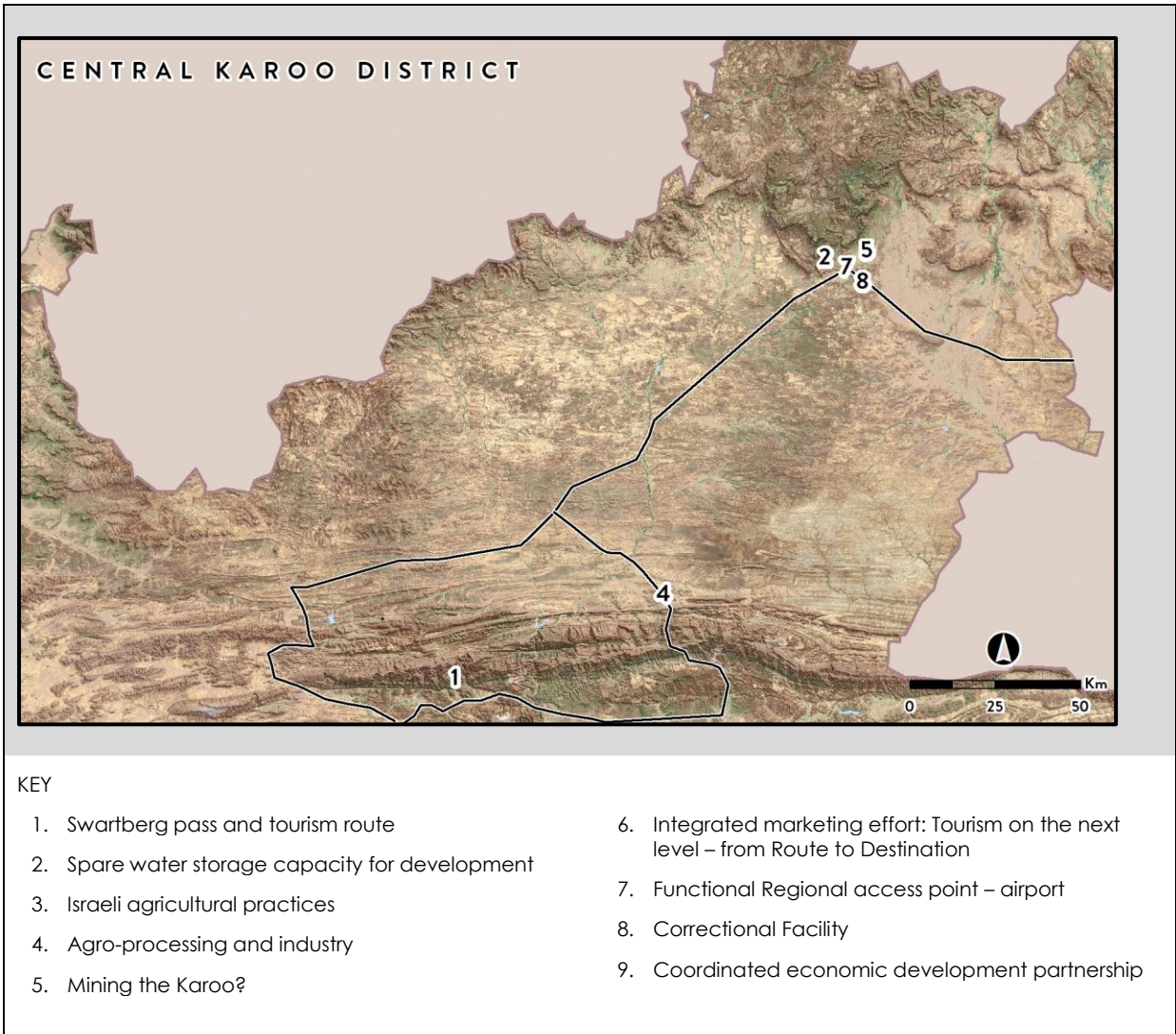


Figure 25 Central Karoo District Municipality 'big ideas'

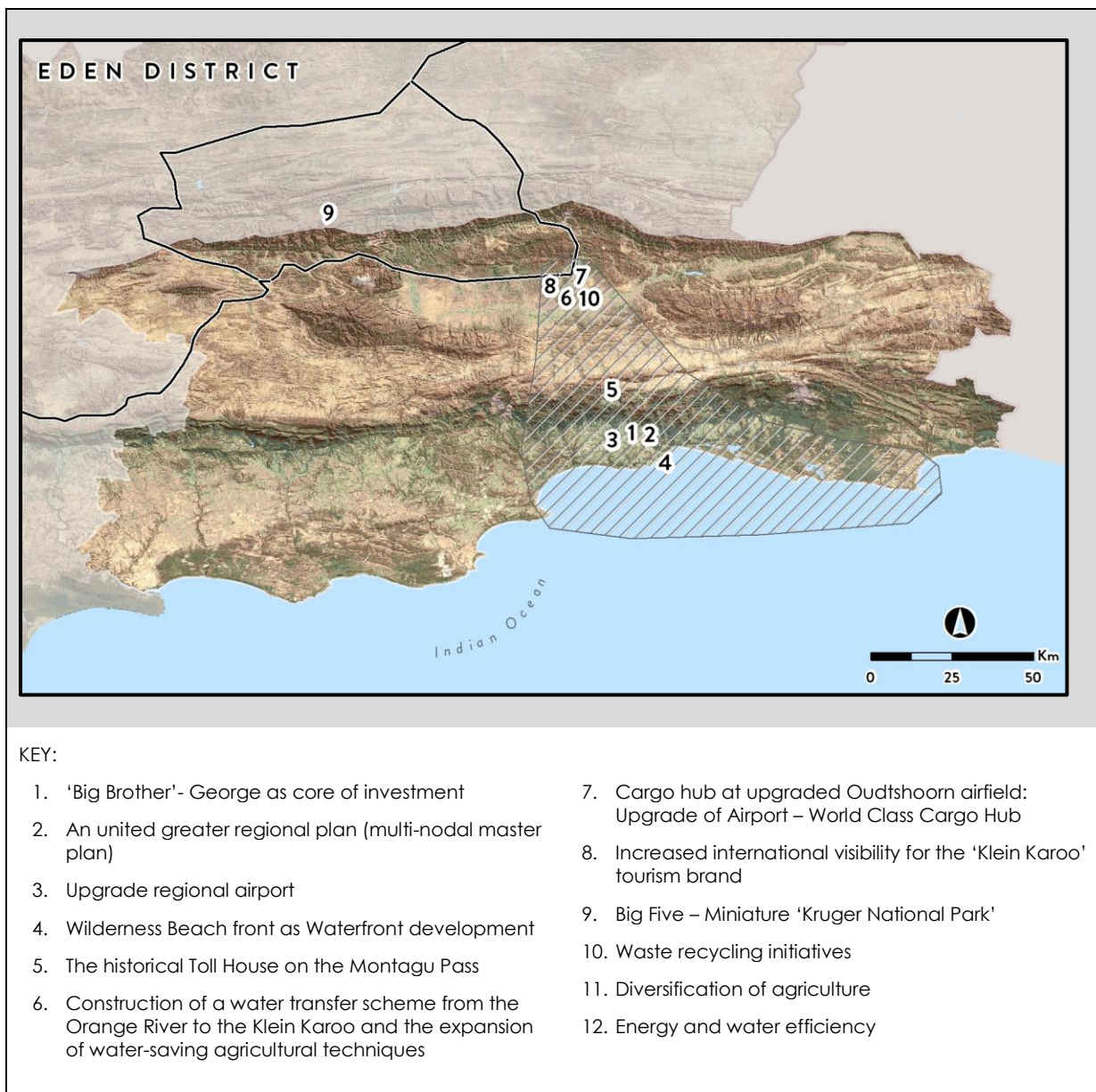


Figure 26 Eden District Municipality 'big ideas'

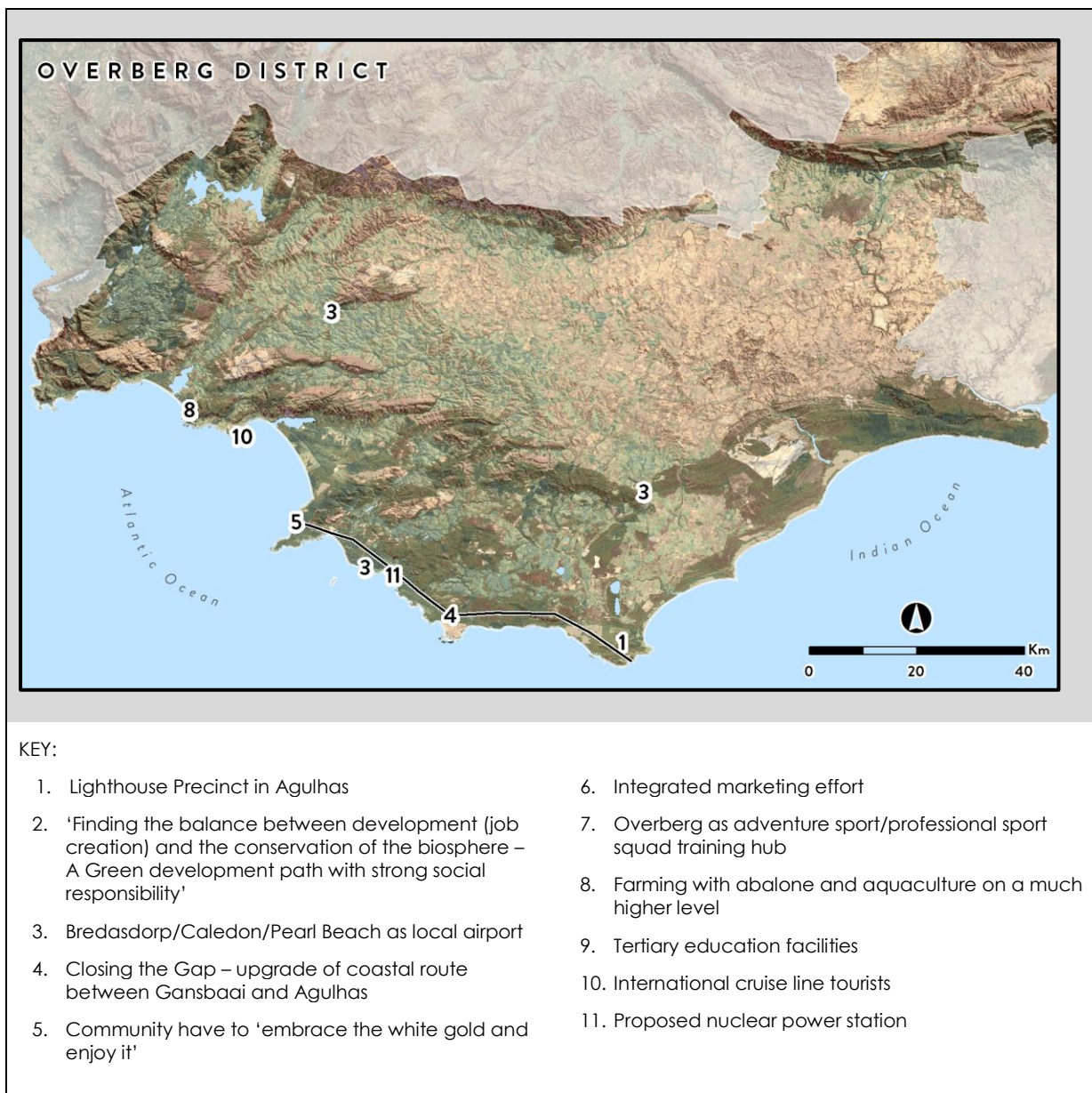


Figure 27 Overberg District Municipality 'big ideas'

5.2 Main factors inhibiting growth

It became evident during the round-table discussions that there are some generic issues faced by all regions. A brief discussion of eight of these is provided in the following subsections.

5.2.1 Scepticism towards the proposed outcomes of suggested intervention

It seems that many of participants was under the impression that the previous GPS reports suggested that investment should be prioritised in regions with high growth potential only as opposed to areas with low potential. This principle was viewed with great scepticism. Hence GPS2013 developed a range of tools to support decision making at various scales and emphasizing that the results do not imply that development and investment will only take place in certain areas and not in others. What it does imply is differentiation in scale and intensity and support tailored

according to the governing circumstances in each area. Although the general response to the qualitative assessment was positive, some of the participants were less enthusiastic about whether any of the 'big ideas' identified will materialise. The question was also raised on how this component relates to the IDP process, which was viewed by some observers to be ineffective. Some participants mentioned 'research, consultation and engagement fatigue'.

5.2.2 Bureaucracy and red tape

Bureaucracy and red tape was identified as a possible impediment to growth. The authorisation processes in some departments are seen to be too lengthy and time-consuming with over-regulation, and local municipalities are commonly seen to be behaving like gate-keepers, preventing development. Whether this is a reality or perception needs to be assessed – but the problems are exacerbated by changes in personnel and regimes at local and provincial level; the appointment of consultants and the drainage of funds through professional fees creates a decision-making vacuum, where officials are unwilling to make decisions perceived to be risky, jeopardising their careers.

The poor dissemination of information on all spheres of governance is hampering knowledge flows, and is likely to have a negative impact on development. The notion of an 'infopreneur', a person solely tasked with the collection, collation, sorting and distribution of government reports needs to be considered. Ideally, local municipalities should be compelled to design a state of the art information management system, something seriously lacking at present.

5.2.3 Social grant system and poor education

Throughout the province there is the firm belief that the social grant system is creating a culture of 'voluntary unemployment', leading to a sense of dependency, working against inculcating an entrepreneurial mind-set and creating numerous social issues. Further, the lack of post-school training centres compounded by the decline in school standards results in youth unemployment, especially for those from settlements with low potential. The despair that sets in amongst unemployed youth may lead to a host of problems such as substance abuse, crime, etc.

Although the social grant system is a national governmental issue the provincial government has to start thinking about how to deal with this complex reality.

5.2.4 Parallel processes of 'governance'

Many of the stakeholders viewed the local municipalities in a number of regions as weak, with little competence in dealing with developmental challenges – let alone the everyday management of administrative structures. One answer to this is the establishment of parallel structures of 'governance' where private sector and NGOs work together to 'make things happen'. There is an urgent need for bringing these parallel processes together in partnerships and there is an overwhelming enthusiasm province-wide for the establishment of an Economic Development Partnership

(EDP). However, according to the EDP, the regional partnership formations must come from the regions themselves, and this parallel process should now be steered appropriately.

5.2.5 Water

Most participants agreed that the main resource worthy of investment is water. The building of dams, raising dam walls, alternative sources of water (desalination, fog harvesting, grey-water) and water transfer schemes linked to the Orange River and elsewhere is an absolute necessity for regions to unlock potential, especially in the agricultural sector. The National Development Plan (NDP) compiled by the National Planning Commission (2012) recognises that agriculture is the primary economic activity in rural areas with the potential to contribute a significant proportion of jobs to the overall employment target. The NDP identifies the following interventions to achieve increased employment opportunities in the sector:

- Expansion of irrigated agriculture through improved utilisation of existing water resources and development of new water schemes;
- Conversion of under-utilised communal land and land reform projects into commercial production;
- Support commercial agriculture sectors and regions that have the highest potential for employment and growth;
- Support job-creation in upstream and downstream industries with potential for employment coming from the growth in output from the three aforementioned strategies;
- Finding creative combinations between opportunities. For example, land could benefit from irrigation infrastructure, priority can be given to successful communal farmers, support given to industries and regions with a high potential to create jobs, and there could be increased collaboration between existing farmers and land reform beneficiaries; and
- Strategies for new entrants in the market to access product value-chains and support from better-resourced farmers.

The dominance of the metropolis impacts on the resource-base of the hinterland and beyond: the regions should invest in water demand management systems. The importance of improving the capacity and processing of applications by key departments such as Water Affairs was also raised. .

5.2.6 Think regionally

It was anticipated that towns would adopt a silo approach to regional development. There is however an awareness amongst the participants that different towns within a region have to start thinking about their neighbours and how these can work together to direct and stimulate growth in specific nodes. This cooperative ethos is more apparent in regions where the settlement systems are currently much more integrated (e.g. Garden Route region), and in close proximity to each other, compared to the vast region of the Central Karoo.

5.2.7 Big Brothers

During the discussions with stakeholders it became clear that there is a perception that resources are mainly channelled to Cape Town, and the leader towns. The regional approach requires that larger towns undergo a change in mind-set to recognise that they have to partner with smaller towns in order to grow each regional economy. Given the economic, social and other flows between settlements, the partnership idea seems to be a feasible and cohesive way to unlock development potential.

5.2.8 Champions (government)

Each of the ideas for interventions requires 'champions' at the regional level to drive these projects. The LED managers within each local and district municipality are ideally placed to take the lead in many of these recommended projects. Unfortunately, many LED managers and LED officers did not attend the round-table discussions within their regions. Furthermore, upon request for stakeholder lists, many officials indicated that such a list does not exist, nor a database of economic stakeholders. It is clear that officials need to be instructed and sensitised to the importance of these key ideas in order to work towards their successful implementation.

5.3 Conclusion

The stakeholder engagements facilitated the identification of some imaginative initiatives for unlocking latent potential. It also highlighted frustration with all levels of governance. The imaginative ideas that were presented in Section 5.1 come from individuals and organisations who work at the coalface and who know what is required to unlock economic potential. There is however a danger in creating expectations among stakeholders to identify 'big ideas' that would unlock potential. There is a need to develop the awareness amongst communities that active participation and ownership by well-linked stakeholders is a prerequisite to demand-led development. Such involvement by well-linked stakeholders is important because full ownership and control of the initiatives by the stakeholders is the backbone of all responsible development.

Over the last 50 years, there has been a clear move away from the static and top-down approach to the process-oriented, bottom-up approach. The reality is that few externally-initiated and controlled initiatives ever survive the end of the project, and this is recognised today as never before (Deutsche Gesellschaft für Technische Zusammenarbeit 2003). The opportunity exists to propel the 'big ideas' into the domain of catalytic projects that have the potential to unlock growth in the province.

6. CASE STUDIES

The aim of this section is to provide a brief overview of some selected nodes of settlements and how these may respond to developmental challenges proposed by stakeholders. In all three nodes transport development was identified as a crucial intervention.

6.1 Knysna-George-Mosselbaai

As discussed in Section 4.2.1, George, Knysna and Mosselbaai (Figure 28) were rated as having very high growth potential. These towns along the Garden Route were also identified in the 2006 NSDP as an area of national economic significance (Figure 29). The GPS2013 thus reinforces this corridor of development as an area that warrants special emphasis in policy to advance growth.

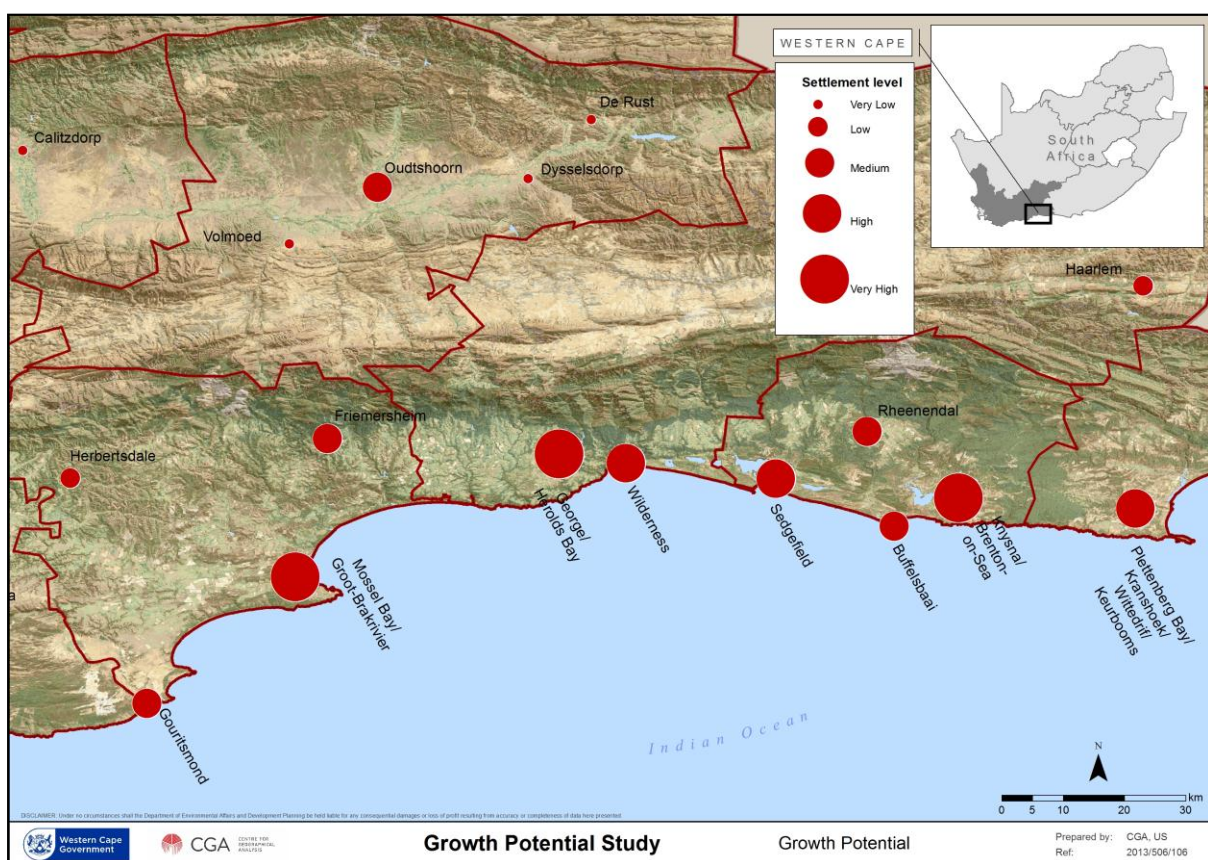


Figure 28 Regional overview of Garden Route settlements

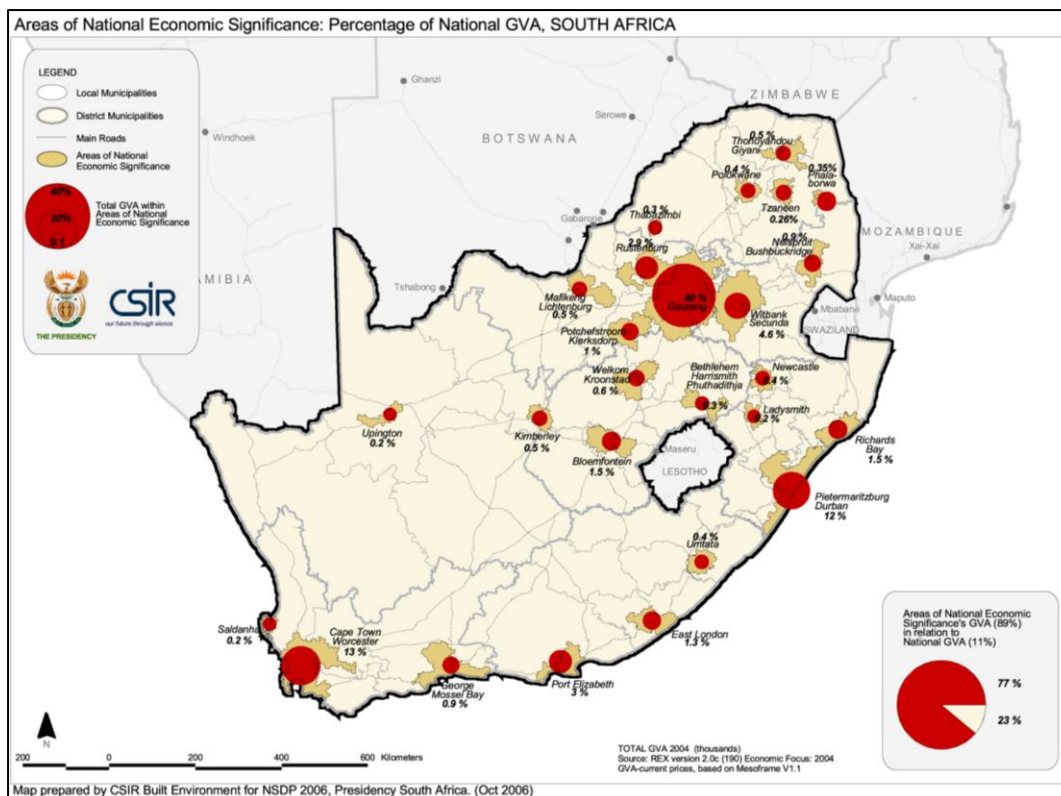


Figure 29 George-Knysna-Mosselbaai in the national space-economy context

Knysna is classified as having a very high overall growth potential (Table 19) and achieved ratings of very high on the human capital, infrastructure, and institutional thematic indices and a high rating on the economic and physical thematic indices (see Sections 4.3.2 and 4.3.3). Major factors contributing to the very high growth potential include the availability of high-quality infrastructure (high scores were achieved in most of the indicators in this thematic index) as well as the quality and experience of governance as reflected in the *Institutional Index*.

Although the settlement performed very well in the infrastructure and physical indices, the relatively small proportion (72%) of households with access to sanitation (flush) and the projected short term shortfall of peak summer average daily water demand considering internal reticulation storage (-0.72 mcm/a) will have to be addressed. The town has a medium level of socio-economic needs expressed in absolute terms and a high level of needs in proportional terms, with the high levels of unemployment (24.5%) a specific aspect of concern. This also highlights the sharp contrasts in living conditions with, despite the high levels of unemployment, Knysna achieving the highest score in the province for the indicator measuring average per capita income.

The town of George, with an estimated population of nearly 160 000, is classified as having a very high overall growth potential (Figure 7) and ranked as the settlement with the highest growth potential within the Western Cape (excluding the Cape Town Metropolitan area). It achieved a very high rating in the economic, infrastructure, and institutional thematic indices and a high rating for the human capital and physical indices. On the *Economic Index* it achieved the highest overall

score within the province and registered the highest score on three of the individual indicators forming part of this index (total personal income, value of property transactions, and the number of formal retail outlets and service sector businesses). The town is further characterised by high quality infrastructure and achieved high and very high scores on most of the individual indicators forming part of the *Infrastructure Index*. The projected short term shortfall of peak summer average daily water demand considering internal reticulation storage and the limited waste water treatment work spare capacity per person are aspects of concern that may impact negatively on realising future growth. George also performed exceptionally well on the *Institutional Index*, although the reduction of basic infrastructure backlogs still remains a challenge. This is also reflected by the *Socio-economic Needs Index* in terms of which George is classified as having very high levels of socio-economic needs (expressed in absolute terms relative to the rest of the province).

Mosselbaai is a large town with a population of more than 80 000 (including its functional hinterland) with the tourism and gas/petroleum (PetroSA and Mossgas) sectors the main contributors to the growing economic base. It is classified as having a very high growth potential (Figure 7) and performs particularly well on the infrastructure and institutional thematic indices (very high) and the *Economic Index* (high). Compared to other towns within the province, Mosselbaai performs exceptionally well in terms of the size and diversity of its retail and services sector and the levels of activity in the property market. The town is well endowed with high quality infrastructure and achieved very high scores and rankings across almost all indicators on the *Infrastructure Index*. Notable strong points under the *Institutional Index* are the highest scores in the province achieved on the crime occurrence indicator and management experience and capacity indicators. One of the critical challenges to sustaining the potential future growth of the town is the projected short term (2020) shortfall of peak summer average daily water demand considering internal reticulation storage (-1.22 mcm/a). Expressed in absolute terms and in comparison to the rest of the province the town has a high level of social economic need (although it represents a relatively low proportion of the population).

Table 23 compares the results of the GPS2013 quantitative analysis of the three towns' scores out of 100. The results in most of the indicators are showing that the towns are facing many of the same issues and challenges (e.g. unemployment, economic empowerment, growth of economic active population, ground water availability and quality, infrastructure backlog reduction, etc.).

Table 23 Quantitative comparison between Knysna, George and Mosselbaai

Indicator/Index	Knysna	George	Mosselbaai
	Score out of 100		
Average per capita income 2011 (Rands) [+]	100	45	32
% change in economic empowerment 2001 - 2011 [+]	37	30	33
% Unemployment 2011 [-]	37	48	44
Matric pass rate 2012 (%) [+]	79	77	60
% 20 - 65 year olds with at least grade 12 and higher [+]	47	47	51
Ratio non-economically active population age 2011 [-]	60	59	60
Human Capital Index	67	53	45
Tourism potential 2008 [+]	88	74	69
% Growth of economically active population 2001 - 2011 [+]	11	22	13
Distance to PE, CT and 6 leader towns [-]	30	70	41
Total personal income 2011 (Rands million) [+]	38	100	55
% Growth in highly skilled labour 2001 - 2011 [+]	34	34	30
Value of property transactions 2010 [+]	67	100	58
Property tax revenue 2010 [+]	63	96	30
# of formal retail outlets and service sector businesses 2010 [+]	40	100	58
Economic Index	60	100	57
Mean annual precipitation [+]	71	58	31
Projected short term (2020) surplus/shortfalls of peak summer GAADD considering internal reticulation storage 2011 (mcm/a) [+]	29	9	23
Groundwater availability 2011 (mcm/a) [+]	46	45	38
Groundwater quality 2011 [-]	63	63	88
Potential evaporation (mm) [-]	72	70	68
Grazing capacity [+]	30	56	21
% Area cultivated 2012 [+]	5	22	30
Growth in % area cultivated (2007 - 2012) [+]	12	8	5
Size and status of unexploited minerals 2010 [+]	3	14	6
Physical-Natural Index	61	66	53
% households with access to the Internet 2011 [+]	45	46	46
Distance to nearest scheduled airport [-]	86	100	95
Distance to nearest commercial harbour [-]	70	89	98
Distance to nearest small harbour and slipways [-]	99	77	85
Access to main and national roads [+]	91	92	100
Access to railways [+]	99	97	99
% households with access to cellphone 2011 [+]	82	79	85
% households with access to sanitation (flush) 2011 [+]	65	88	90
% households with access to water (in house) 2011 [+]	88	91	94
% households with access to electricity (lighting) 2011 [+]	72	77	84
% households with access to waste removal 2011 [+]	91	91	94
WWTW spare capacity per person 2011 (l/day/pop) [+]	3	4	2
State of WWTW infrastructure 2011 [+]	80	60	80
Infrastructure Index	85	88	95
Management experience and capacity 2010 [+]	73	67	100
Qualified audits 2012 [+]	67	67	67
Infrastructure backlog reduction 2010 [+]	20	14	21
Staff per cap ratio 2010 [-]	92	74	77
% Posts filled 2010 [+]	82	69	81
% Crime (all) occurrences change 2009 - 2012 [-]	68	74	84
Crime (all) occurrences (09 - 12) per 100 000 population [-]	98	97	100
Small business support 2010 [+]	100	100	100
Amenities 2010 [+]	36	90	58
Social service organisations 2010 [+]	92	83	50
Institutional Index	97	98	99
Growth Potential Index [Very High]	89	100	83

In his written critique of GPS2010 to the project team Prof Ivan Turok stated that “one of the limitations of a study focused on individual towns and municipalities is that it is somewhat insular and loses sight of the bigger picture. A good example of this is the report's neglect of the role of connecting towns through improved transport and communications infrastructure. This is bound to be an important part of the solution to the problems of the more isolated parts of the province with low growth potential and high social needs. Such places must seek to understand and develop their functions in relation to the wider city-region of which they are a part.” Similarly, the OECD (2009) argues that ‘national governments should promote growth in all regions. And regions should invest in their own growth by mobilising local assets and resources so as to capitalise on their specific competitive advantages, rather than depending on national transfers and subsidies to help them grow.’ The OECD believes that innovation and other growth factors are linked to geography, explaining why some regions grow while others do not, and that “comparative advantages and complementarities across regions will help ensure that growth in one place produces benefits elsewhere.” The OECD further states that “policies that only boost agglomeration, such as investment in hard infrastructure, will not automatically lead to higher growth. Indeed, the potential for non-agglomerations, including rural and intermediate regions and medium-size cities, to grow should not be underestimated, and should be better integrated in policy decisions.”

The three towns (Mosselbaai, Knysna and George) each within their own local municipality are all located within a particular daily urban system. This urban system formation fits into what can theoretically be defined as a dispersed city. According to Burton (1963: 287) “The ideal-typical dispersed city consists of a number of discrete or physically (but not necessarily politically) separate urban centres in close proximity to each other and functionally interrelated, although usually separated by tracts of non-urban land. The size of these urban places is larger than might normally be expected for centres so closely spaced, and presupposes an economic base other than the provision of services for a surrounding area in which field or row crop agriculture is the dominant activity... A clue to the existence of dispersed cities may be seen in their population size. There should be no predominant city with population twice that of its nearest rival. Rather there should be several cities in the same size class of population”. This description seems to fit the group of three towns discussed earlier in this section.

During the qualitative phase of the GPS2013 an attempt was made to identify the broader context of such regions. At these stakeholder meetings broad initiatives for identifying latent development in these areas were identified. All such identified potential projects were place-specific. For example, what happens in George therefore may have an indirect impact on Mosselbaai and Knysna but the focus is on George. Since then the establishment of EDPs were widely promoted and established throughout the province. The success of these initiatives is yet to be investigated.

A key policy challenge for the Province will be to break through such municipal boundary administrative and planning barriers. The district municipalities are supposed to do this but their jurisdiction and actual role in facilitating coordination between settlements remains challenged and questionable. However, policy should be designed to identify economic clusters such as the trio of towns with very high growth potential. A regional plan as a blue print for growth should not be envisaged. To some stakeholders it will never work and the plan will easily become redundant. A carefully worked out master business plan must be formulated and continuously adapted because visions improve, and changes are being dictated by globally-based realities. The most important key factor is that of a quality regional business leadership in a functionally united mode. The vision must be above 'my town greed' and preference.

What are the similarities or differences between these towns? George is a service centre, Knysna is a tourism hub and Mosselbaai is industry driven. What can tie them together? Transportation access is seen as crucial for their integration and agglomeration. The integration of the three core settlements can perhaps be best illustrated through the proposed intervention of reintroducing the Choo-Tjoe railway line. Household waste is currently transported on a daily basis between Knysna and George to the dumping site in Mosselbaai. At present there is a strategy (at George municipality) to pursue one integrated concession proposal that would include:

- Waste by rail as key commodity;
- Additional rail freight commodities be identified and secured for the George-Knysna line;
- Operating a tourism passenger services during day time hours, to include a steam train (Choo-Tjoe) service on a new economically viable schedule; and
- Cycling be allowed in service roads relating to the railway line.

The above proposal opens up opportunities for a range of industry projects related to tourism, service economy, light industry, training, transport, recycling and waste management.

Another transport related integrative strategy could be the upgrading of the George regional airport to an international airport, one that can handle zero-visibility landings. George Airport is located approximately 10km west of George's CBD. With the exception of Cape Town and Port Elizabeth, it is the only airport along the Garden Route which accommodates both scheduled and unscheduled flights, and is very well linked to major connector routes: The N2 freeway, running along the Garden Route connecting Cape Town with Port Elizabeth; The N9 (through the R404), linking the inland farming areas of the Klein Karoo and the Indian Ocean; The Cape Town-Port Elizabeth-Johannesburg passenger rail line (operated by Shosholozza Meyl) runs just south of the airport. The George Airport is a major arrival point for people wishing to access the Southern Cape. Besides passengers it also transports locally produced goods such as flowers, fish, oysters, herbs and ferns, destined for the export market. There is major scope for cargo flights.

Any potential public investments that might be derived from the proposals above would have to pass the muster of economic viability. Drawing on the insights gained from the inclusive economic growth literature, any public investment should be deemed economically viable if it makes a positive contribution to job creation and increasing productivity. Moreover, such investment, especially if it is of an infrastructural nature, is only likely to make a positive contribution to economic growth in a region if the region has the pre-requisite human capital and innovation potential. This is related to the ability of a region to mobilise its own local assets and resources.

In the George-Knysna-Mosselbaai region the *Human Capital Index* suggests a region with an 'average' human capital endowment rather than exceptional. Although Knysna has a high index score for average per capita income (contributing to an above average *Human Capital Index* of 67), it is probably a reflection of the human capital of the retired population in the town, rather than the human capital potential of the economically active population. This interpretation is supported by the below average per capita income scores for George and Mosselbaai. It is also underscored by the modest indices for the percentage of 20 – 65 year olds with at least grade 12 and higher.

The innovation potential of the region's population is difficult to assess. The growth of highly skilled labour in the region is significantly below average, suggesting that there has probably been an outmigration of highly skilled labour from the region. This somewhat negative indicator appears to be at least partially compensated for by some of the institutional indices. The towns of the region score high on management experience and capacity, and small business support.

The very high growth potential of these towns is partially the result of the high *Infrastructure Index* and the very high *Institutional Index* classification. These may point towards a favourable ability of these settlements and the surrounding areas to mobilise their own local assets and resources. Strengthening this view is the very high index score for George for the number of formal retail outlets and service sector businesses. The potentially positive contribution that public institutions can make towards the growth imperative is suggested by the relatively high index scores for management experience and capacity and percentage of posts filled.

As discussed in Section 2.1.2, and underscored by the findings of the OECD study discussed in Section 2.1.3, the existence of some 'prior conditions' that are given high political, social or economic importance is no guarantee that public investment will generate growth in a region. This suggests that for the George-Knysna-Mosselbaai region the high *Growth Potential Index* may be a good guide towards policy prioritisation in the province only on the condition that adequate attention is given to the mobilisation, attraction and retention of high level human capital and innovative skills in the region. If that can be achieved prioritising public investment in the region may well have the potential of achieving the desired economic development outcomes of job creation and productivity improvement.

6.2 Worcester, De Doorns and Touwsrivier transport corridor

An overview of the growth potential and socio-economical needs of Worcester, De Doorns and Touwsrivier (Figure 28) is provided in this section. The section starts with a discussion of each individual settlement and concludes with a regional synthesis.

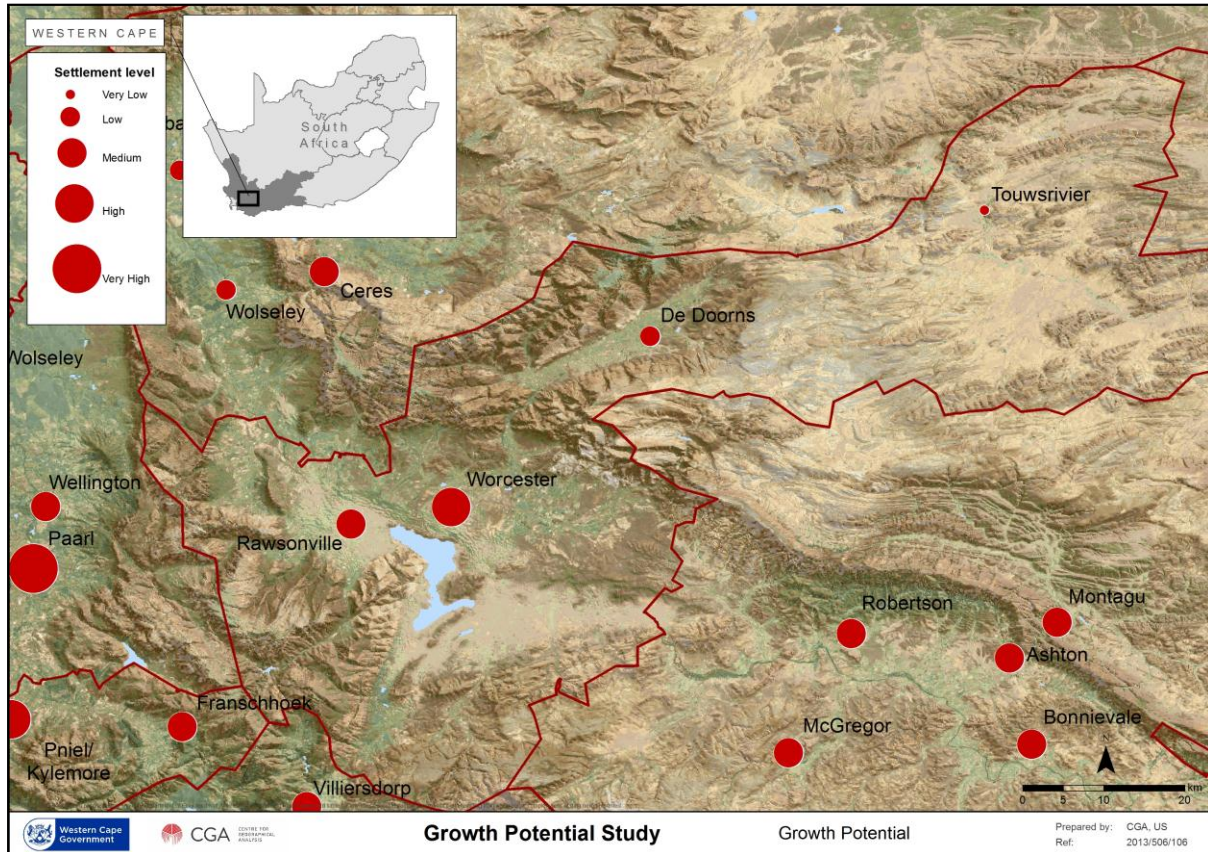


Figure 30 Regional overview of Worcester, De Doorns and Touwsrivier

6.2.1 Worcester

Worcester is not only the seat of the Breede Valley Municipality, but also the regional service centre for the North Boland area. Worcester is a world leader in the context of enabling, innovating, building knowledge and skills in people with disabilities. Its economic influence in terms of functions and services extends as far as Citrusdal, Calvinia, Carnarvon, Laingsburg, Barrydale and Swellendam. Economic interaction at the provincial, national and international levels occurs through the export and import of agricultural products as well as specialised functions such as the well-known institutions for the disabled, tertiary institutions and a number of renowned international businesses. Worcester forms a North-South and East-West traffic node with excellent road and railway connections, which enable optimal access to the markets of the Cape Town metropolitan area. Industrial developments, together with agriculture and commercial services, form the economic base and support the growth potential of the town. The infrastructure of the town is well developed with sufficient sources of water and spare capacity in the sewerage system. Worcester also has enough land for spatial expansion. A wide variety of specialised and high-

level medical services are provided in the form of the provincial and private hospital, a training hospital and a hospital for tuberculosis. Other services and facilities include famous schools and training centres, and state institutions at provincial and national level. Various development initiatives contribute to economic growth, among which the regional shopping centre and industrial development.

The natural environment (mountains and the Breede River) offer substantial tourism potential. Worcester experiences sustained population growth due to the large numbers of migrants from the Eastern Cape settling here before moving on to the Cape Town metropolitan area. Worcester has all the ingredients and potential for a Secondary City to support Cape Town in the National urban hierarchy (Van der Merwe et al. 2004: 95).

6.2.2 De Doorns

The small town of De Doorns lies at the centre of the Hex River Valley only one and a half hours' drive from Cape Town, just off the N1 and 35 kilometres north of Worcester, in the midst of South Africa's table grape industry. This is a valley of vineyards, historical Cape Dutch homesteads, and mountains (snow-capped during winter) that combine to make it one of the most picturesque valleys, particularly during autumn when the different vines give rise to a display of variegated colour.

De Doorns fulfils the role of an agricultural service centre for the surrounding farms, which concentrate mainly on viticulture and horticulture. The vineyards offer the greatest resource base for the town and for the surrounding area – its fertile soil and favourable climate being ideal for the cultivation of export-quality table grapes. With its more than 4,800 hectares of vineyards it is the largest producer of table grapes. In particular the town in its surrounding area has excellent ground water quality and high grazing capacity. The combination of access to clean water has led to a 7.1% increase in the area under cultivation (from 2007-2012). Most of the grapes are sold on the international market (Northern Europe, United Kingdom and the Far East) and the area exports some 18 million cartons of grapes annually. The town has good infrastructure, but has limited possibility for expansion due to the high-potential agricultural soil which surrounds the town and which should be preserved at all costs. The total exposure to international markets for the success of the local economy places the community at great risk of economic decline and even possible collapse. Investment intervention is needed to broaden the economic base through the diversification of agricultural potential by switching to other crop types which would be less vulnerable to fluctuations in the world market (Van der Merwe et al 2004).

This labour intensive industry was hit hard with a declining economy in their core market areas (2008-2011) that led to a rise in unemployment – and especially the loss of seasonal work opportunities. The ability of the agricultural industry to cope with the changes that market forces and workers are demanding of it, is very difficult to resolve. The majority of the 16 000 employees in this area are seasonally employed. Laubscher (Chairperson of the Hex River Valley Table Grape Association and a fifth-

generation farmer – January 2013), has estimated that 5 000 workers live on farms and the remaining 11 000 come from towns such as Touwsrivier and Worcester or live in two informal settlements – Stofland and Sandhills or more commonly known as "GG camp" – in the De Doorns area. Because grapes are harvested during summer, employees have no income during winter. According to BusinessReport (2013), De Doorns boasts the perfect 'architecture for protest' and unfortunately, over the last few years this small towns' image was imprinted in the psyche of every South African as a town with smouldering labour unrest. The regular occurrences of labour instability (also linked to xenophobic attacks) have harmed the special sense of place of this small town.

De Doorns is a social needs 'hotspot' and was identified in GPS2004 as a town in dire need of social investment. The Department of Social Development's Mikondzo Project – a service delivery improvement initiative targeted at the poorest 1300 wards in the country – has recently uncovered (nine years after GPS2004 was completed) a number of service delivery shortcomings and social challenges in the community of De Doorns, including: lack of Early Childhood Development (ECD) services; limited social security services; alcohol and substance abuse; a prevalence of foetal alcohol syndrome; unemployment; teenage pregnancy; and malnutrition (Department of Social Development, De Doorns, October 12, 2013). Currently almost 40% of the population reside in informal settlements and the same percentage receives social grants.

In spite of having a strong natural resource base (classified as high in the *Physical Index*) De Doorns has a low overall growth potential (Table 12). The scenic beauty of the natural environment – where farms lie nestled between the Hex and Quadou Mountains – provides an excellent resource base for nature-based tourist activities (hiking, mountain biking and rock climbing, etc.). Tourism and hospitality superstructure (hotel, guest houses and all inclusive wedding venues) in the region confirms a tourism economy in its developmental stage.

Compared to other settlements in the province, De Doorns was classified as having a medium human capital capacity and economic base. A major constraint to growth is the town's poor access to basic services, with very few households having access to Internet, cell phones, in house water, electricity and waste removal. Safety and security is not a problem, although the number of reported cases has increased by 14.2% from 2009 to 2012. This increase may be related to the town's high and very high levels of proportional and absolute social needs (see Table 10 and Table 11 respectively).

6.2.3 Touwsrivier

Touwsrivier is an old railway village – a place where a large steam locomotive yard housed extra engines that could be attached to trains prior to their passing through the mountain passes. This function declined in importance as locomotives increased in power and several improvements were made to the rail line. Today there is some industry occurring in the old locomotive sheds. Due to multiple reasons (price of oil

and petrol, impact of heavy road vehicles on road infrastructure, etc.), there is suddenly a national political will to rediscover the value of a reliable railway transport system for passengers and freight in South Africa. Touwsrivier – as well as other strategic well located small towns – can capitalise on this opportunity by integrating its natural and cultural tourism sites with the rail network. The emergence of nearby game reserves and their spin-offs, including maintaining the only hotel, are important opportunities that should be promoted.

The quantitative analysis revealed that Touwsrivier has in proportional terms medium socio-economic needs (19% unemployed, 20% social grants and 3% live in informal settlements) and a very low growth potential. The main aspects contributing to the latter is its very limited human capital. A major concern is the relatively poor education levels and low matric pass rate (70.9%), while access to water poses a physical constraint on growth. The town's annual rainfall is only 201mm and the projected short term (2020) shortfall of peak summer GAADD (considering internal reticulation storage 2011) is 0.13 mcm/a. However, in contrast to De Doorns, most households have access to basic services such as sanitation (89.3%), water (80.6%), electricity (92.1%) and waste removal (76.6%). The crime level is also relatively low (0.11 cases per 100 000 population), but the 10.1% increase recorded from 2009 to 2012 is cause for concern.

6.2.4 Regional synthesis: Worcester-De Doorns-Touwsrivier

Table 24 compares the results of the GPS2013 quantitative analysis of the three towns' scores out of 100. Worcester represents the industrial-, services-, institutional- and logistical hub in this 'development/transport corridor'. Worcester has a high growth potential and its economic sphere of influence over shadows the other two smaller towns in the corridor. The diagnostic quantitative indicators in Table 24 paint a less prosperous picture for De Doorns (low growth potential) and even a more grim economic growth potential picture for Touwsrivier (very low potential). As previously discussed in Sections 6.2.2 and 6.2.3 these towns have some tourism opportunities that can be further developed to supplement their struggling economic bases. In particular De Doorns has adequate natural resources and the potential to diversify its narrowly focussed agricultural economy. Although, linked by the same railway and national road connection, each town represents a diverse 'development context'.

Table 24 Quantitative comparison between of Worcester, De Doorns and Touwsrivier

Indicator/Index [Classification]	Worcester	De Doorns	Touwsrivier
	Score out of 100		
Average per capita income 2011 (Rands) [+]	19	0	8
% change in economic empowerment 2001 - 2011 [+]	29	27	14
% Unemployment 2011 [-]	60	87	51
Matric pass rate 2012 (%) [+]	73	64	23
% 20 - 65 year olds with at least grade 12 and higher [+]	42	14	26
Ratio non-economically active population age 2011 [-]	58	54	55
Human Capital Index	46 [Medium]	36 [Medium]	18 [Very Low]
Tourism potential 2008 [+]	63	61	26
% Growth of economically active population 2001 - 2011 [+]	17	21	14
Distance to PE, CT and 6 leader towns [-]	100	55	53
Total personal income 2011 (Rands million) [+]	60	8	3
% Growth in highly skilled labour 2001 - 2011 [+]	27	53	20
Value of property transactions 2010 [+]	20	1	1
Property tax revenue 2010 [+]	68	2	5
Number of formal retail outlets and service sector businesses 2010 [+]	49	5	2
Economic Index [High]	66 [Very High]	31 [Medium]	16 [Low]
Mean annual precipitation [-]	24	38	8
Projected short term (2020) surplus/shortfalls of peak summer GAADD considering internal reticulation storage 2011 (mcm/a) [+]	24	35	36
Groundwater availability 2011 (mcm/a) [+]	30	30	32
Groundwater quality 2011 [-]	75	75	63
Potential evaporation (mm) [-]	50	55	17
Grazing capacity [+]	72	81	45
% Area cultivated 2012 [+]	16	11	2
Growth in % area cultivated (2007 - 2012) [+]	11	11	8
Size and status of unexploited minerals 2010 [+]	0	0	0
Physical-Natural Index	51 [Medium]	62 [High]	19 [Very Low]
% households with access to the Internet 2011 [+]	47	11	23
Distance to nearest scheduled airport [-]	79	71	61
Distance to nearest commercial harbour [-]	67	57	44
Distance to nearest small harbour and slipways [-]	68	55	42
Access to main and national roads [+]	97	95	99
Access to railways [+]	97	99	100
% households with access to cellphone 2011 [+]	79	59	60
% households with access to sanitation (flush) 2011 [+]	87	86	88
% households with access to water (in house) 2011 [+]	86	62	79
% households with access to electricity (lighting) 2011 [+]	85	20	80
% households with access to waste removal 2011 [+]	83	46	77
WWTW spare capacity per person 2011 (l/day/pop) [+]	2	0	0
State of WWTW infrastructure 2011 [+]	20	60	60
Infrastructure Index	76 [High]	55 [Low]	66 [Medium]

Table 24 (continued) Quantitative comparison between of Worcester, De Doorns and Touwsrivier

Indicator/Index [Classification]	Worcester	De Doorns	Touwsrivier
	Score out of 100		
Management experience and capacity 2010 [+]	73	73	73
Qualified audits 2012 [+]	67	67	67
Infrastructure backlog reduction 2010 [+]	71	71	71
Staff per cap ratio 2010 [-]	51	51	51
% Posts filled 2010 [+]	65	65	65
% Crime (all) occurrences change 2009 - 2012 [-]	0	46	54
Crime (all) occurrences (09 - 12) per 100 000 population [-]	88	91	89
Small business support 2010 [+]	0	0	0
Amenities 2010 [+]	75	15	11
Social service organisations 2010 [+]	100	0	8
Institutional Index	63 [High]	36 [Low]	38 [Low]
Growth Potential Index	67 [High]	41 [Low]	21 [Very Low]

Regions that are primarily geared towards the large-scale production of export crops (such as table grapes in the context of De Doorns) that normally use a large untrained labour force usually offer few opportunities for the development of a balanced urban system. Such rural service centres are consequently often under-developed (Hinderink & Titus 2002).

Although, De Doorns and Touwsrivier do not share the same prosperity as Worcester with the latter having a diversified economy and a highly developed institutional structure, all three towns (and their hinterlands) see employment creation and local economic development as two most important regional priorities. The seasonal nature of jobs in their rural hinterlands, the unfair situation where local agricultural products have to compete against imported agricultural products (that are subsidised in their home countries), a high degree of unpredictability and risk (weather conditions and labour unrest) and reliance on an export market where core markets are situated in old established economies currently recovering from a worldwide economic downturn, are integral components of almost all agricultural activity in this region, and therefore place huge constraints on sustainable livelihoods in the region.

Seasonal unemployment, poverty, substance abuse and crime are part of the low socio-economic context of a large part of the population in this region. According to an LED officer of the Breede Valley Municipality the continual influx of in-migrants prevent proper planning and therefore 'responsive planning' is the only option. Out-of-the-box thinking is necessary to mobilise workers (e.g. skills training, public transport) and enable them to move between sectors, such as agriculture and tourism – but this alone will not solve the unemployment issue because of the constant influx of people to this area.

This region's preferred development path is 'green' – tourism, agriculture, renewable energy and light industries. Uitvlug Industrial Park welcomes light industries to Worcester such as ICT, biotechnology, renewable energy and upmarket residential developments. Wrong choices will hamper or even jeopardise other responsible

developments. Worcester forms a North-South and East-West traffic node with excellent road and railway connections. The current airport can be upgraded to receive spill-over air traffic from Cape Town International, and acts a cargo hub for the export of fruit and other goods grown or manufactured in the region. This would be a natural extension of investment in agribusinesses in the region – adding value to agricultural products of which new products such as olives, and the concomitant olive oil production, can be introduced.

As intuitively appealing as these development options for the Worcester-De Doorns-Touwsrivier region might be, public investment to unlock their potential must still pass the test of economic viability. The *Human Capital Index* for the towns in the region raises doubts about its readiness to meet the economic viability challenge. Specific indicators of human capital also point to human capital constraints. This suggests that there may be human capital limitations on the region's capacity to convert public investment into sustainable job creation and productivity growth.

The ability of a region to innovate in response to public investment and to mobilise its own local assets and resources also depends on whether the public institutions have the capacity to facilitate and enable this mobilisation. The indices for the region are not encouraging although Worcester on its own may have above average institutional capacity. This is unfortunately offset by the apparent human capacity and innovation constraints in the private sector. This is manifested by the relatively low percentage of 20-65 year olds with at least grade 12 and higher, the low growth in highly skilled labour and the relatively low number of formal retail outlets and service sector businesses.

The overall impression is of a town (Worcester) rather than a region that have some potential to turn public investment into sustained economic development, but that the potential is significantly challenged by its human capital capacity to innovate and mobilise local resources. Provincial economic development initiatives in this region will have to incorporate a human capital dimension if public investment were to achieve the desired growth outcomes. It is more likely to be viable in Worcester than in the region as a whole.

6.3 Central Karoo towns along the N1

A brief narrative of the growth potential of Matjiesfontein, Laingsburg, Leeu Gamka and Beaufort West (Figure 31) is provided here. However, while the growth potential of individual towns are important, greater opportunity exist when towns work together and pool their synergies to effect growth on a regional scale. The result can be positive not only for towns along the N1, but also for towns linked to the N1 – towns such as Merweville and Prince Albert. The two indicators that are consistent in strength in these towns are: *Access to main and national roads* and *Access to railways*. The focus of this case study is to leverage the strength of location to transport arteries as a catalyst for intervention. Table 25 provides a snapshot of each town's growth potential rating and sets the scene for the discussion that follows.

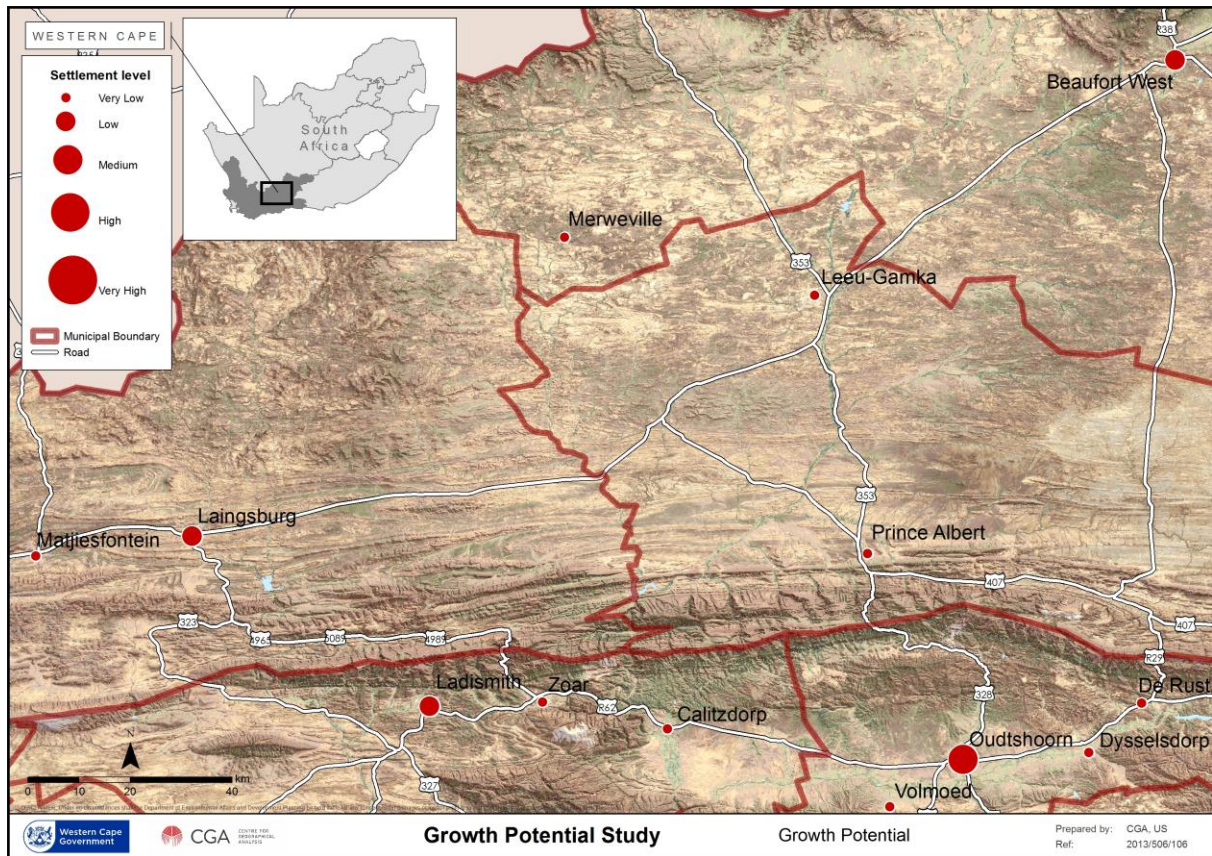


Figure 31 Regional overview of the central Karoo towns along the N1

Table 25 Growth potential rating for Matjiesfontein (MFontein), Laingsburg (LBurg), Leeu Gamka (LGamka) and Beaufort West (BWest)

Indicator/Index [Classification]	MFontein	LBurg	LGamka	BWest
	Score out of 100			
Average per capita income 2011 (Rands) [+]	4	20	3	17
% change in economic empowerment 2001 - 2011 [+]	23	62	17	34
% Unemployment 2011 [-]	52	48	0	46
Matric pass rate 2012 (%) [+]	72	72	28	50
% 20 - 65 year olds with at least grade 12 and higher [+]	18	25	17	35
Ratio non-economically active population age 2011 [-]	58	51	45	46
Human Capital Index	32 [Low]	45 [Medium]	0 [Very Low]	32 [Low]
Tourism potential 2008 [+]	45	28	12	26
% Growth of economically active population 2001 - 2011 [+]	4	12	21	18
Distance to PE, CT and 6 leader towns [-]	50	48	36	24
Total personal income 2011 (Rands million) [+]	0	2	1	15
% Growth in highly skilled labour 2001 - 2011 [+]	22	35	48	33
Value of property transactions 2010 [+]	0	1	0	5
Property tax revenue 2010 [+]	0	1	0	13
Number of formal retail outlets and service sector businesses 2010 [+]	0	2	0	8
Economic Index [High]	16 [Low]	17 [Low]	16 [Low]	20 [Low]

Table 25 (continued) Growth potential rating for Matjiesfontein (MFontein), Laingsburg (LBurg), Leeu Gamka (LGamka) and Beaufort West (BWest)

Indicator/Index [Classification]	MFontein	LBurg	LGamka	BWest
	Score out of 100			
Mean annual precipitation [+]	13	7	6	18
Projected short term (2020) surplus/shortfalls of peak summer GAADD considering internal reticulation storage 2011 (mcm/a) [+]	37	35	37	28
Groundwater availability 2011 (mcm/a) [+]	32	32	31	32
Groundwater quality 2011 [-]	63	63	50	38
Potential evaporation (mm) [-]	35	23	5	14
Grazing capacity [+]	43	48	42	29
% Area cultivated 2012 [+]	1	0	0	0
Growth in % area cultivated (2007 - 2012) [+]	6	19	100	9
Size and status of unexploited minerals 2010 [+]	0	51	34	54
Physical-Natural Index	26 [Very Low]	43 [Low]	52 [Medium]	24 [Very Low]
% households with access to the Internet 2011 [+]	63	22	34	27
Distance to nearest scheduled airport [-]	51	56	79	99
Distance to nearest commercial harbour [-]	40	46	47	29
Distance to nearest small harbour and slipways [-]	45	45	28	20
Access to main and national roads [+]	98	100	94	99
Access to railways [+]	100	99	96	99
% households with access to cellphone 2011 [+]	61	60	56	65
% households with access to sanitation (flush) 2011 [+]	61	88	71	94
% households with access to water (in house) 2011 [+]	2	66	62	81
% households with access to electricity (lighting) 2011 [+]	45	69	71	81
% households with access to waste removal 2011 [+]	73	71	71	88
WWTW spare capacity per person 2011 (l/day/pop) [+]	0	1	0	1
State of WWTW infrastructure 2011 [+]	20	80	80	80
Infrastructure Index	47 [Low]	65 [Medium]	63 [Medium]	72 [Medium]
Management experience and capacity 2010 [+]	47	47	0	67
Qualified audits 2012 [+]	33	33	33	67
Infrastructure backlog reduction 2010 [+]	97	97	85	69
Staff per cap ratio 2010 [-]	65	65	32	77
% Posts filled 2010 [+]	100	100	95	88
% Crime (all) occurrences change 2009 - 2012 [-]	70	59	68	47
Crime (all) occurrences (09 - 12) per 100000 population [-]	81	92	98	87
Small business support 2010 [+]	0	0	0	100
Amenities 2010 [+]	1	10	2	36
Social service organisations 2010 [+]	0	8	0	33
Institutional Index	40 [Low]	44 [Medium]	20 [Very Low]	83 [Very High]
Growth Potential Index	22 [Very Low]	39 [Low]	19 [Very Low]	44 [Low]

6.3.1 Matjiesfontein

The hamlet of Matjiesfontein (population 422) is located 237 km from Cape Town, in the Laingsburg Municipality, in close proximity to the N1 and the Trans-Karoo railway line and was originally established as a railway rest-stop. It has been declared a National Historic Monument and is an historical tourist attraction with a pub,

museums and accommodation establishments. The famous Blue Train stops at the station.

According to the quantitative analysis results, the settlement has a very low overall growth potential (Table 25). This is mainly attributed to very limited natural resources, although the settlement scored low in all of the thematic indices. Given its low rainfall (252mm) and high potential evaporation (2208mm), the region is not suitable for rain-fed agriculture. This is also likely the reason why the area under cultivation has decreased by 2.2% since 2007. There is no projected short term (2020) surplus of peak summer GAADD, which will inhibit further urban growth if it is not rectified. In terms of the *Socio-economic Needs Index* (Table 10), the settlement scored very high in proportional terms.

6.3.2 Laingsburg

Laingsburg is a small town situated along the N1, approximately 263 km from Cape Town and 199 km from Beaufort West. It was established as a service centre for rural agriculture and rail transport and currently services a very large agricultural (mostly stock farming) area. It is a major stop for through-traffic, especially private long-distance buses.

As with most of the surrounding settlements, the availability of water for domestic and agricultural use inhibits growth. Other constraining factors include its poor tourism potential and the relatively small proportion of households having access to electricity (87.8%), internet (16.4%), cellphones (74.9%), and in-house water (69.4%). Conversely, the settlement has experienced a significant increase in economic empowerment from 2001 to 2011 (47.8%), enjoys relatively low crime rates, and has above average unexploited minerals. Socio-economically the town has a low absolute need, and medium proportional need.

6.3.3 Leeu Gamka

Leeu Gamka was established as a railway settlement and is situated next to the N1, 77 km from Beaufort West, along the national road and main railway line to Cape Town. The residential area of Bitterwater is located out of view from the national road, behind a ridge.

According to the quantitative analysis results, the settlement has a very low overall growth potential, mainly due to a very limited human capital (lowest in the province) and poor institutional framework. In particular, the settlement has the highest level of unemployment (38%) in the province, a very low per capita income (R16126), and very low matric pass rate (72.5%). The main economic activities are generated by the traffic on the N1 route and the prospects for other sources of development (e.g. tourism) is very limited (Table 25). Interestingly, the settlement and surrounding area has experienced a dramatic (113%) increase the proportion of land used for cultivation, in spite of having very limited access to water. However, cultivation remains a very small part of land use in the area (0.3%). The above-

average size and status of unexploited minerals is likely the main opportunity of growth in the area. In proportion to its population, Leeu Gamka has high socio-economic needs.

6.3.4 Beaufort West

Beaufort West, located 460 km northeast of Cape Town, is the administrative, economic and political hub of the Central Karoo District Municipality. The town has managed to maintain minimal levels of growth owing to the high volume of passing road traffic and its role as a transport hub. This is in spite of the declines in rail transport and agricultural activities. The N1 national road bisects the town and is responsible for generating a significant portion of the town's income. In addition to its strategic location about halfway between Bloemfontein and Cape Town, the town also acts as a service centre for stock and game farming in the area.

Overall, the town is rated as having a low growth potential, but has a very strong institutional framework. The main factors contributing to the latter is the fact that it enjoys small business support, has a very low crime rate, and relatively low staff per capita ratio. The main physical impediment to growth is water availability (shortfall of 0.78mcm/a by 2020), but its mineral deposits and relatively good infrastructure, particularly the airport, is an asset. Service delivery is generally good, with 94%, 92% and 87% of households having access to sanitation, electricity and waste removal respectively.

6.3.5 Synthesis

Matjiesfontein, Laingsburg, Leeu Gamka and Beaufort West are towns with low- to very low growth potential and medium to very high social needs. The artery that connects the afore-mentioned towns (and Touwsrivier and De Doorns) is the National Road (N1) and the main railway line from Cape Town to Bloemfontein and beyond. Serious consideration must be given to reviving the use of the railways as the preferred, cost-effective, safe and efficient mode of transport for passengers and freight. The modal shift from road to rail will relieve the pressures on the national road and provide employment along this transport artery.

The upgrading, management and promotion of rail transport could lead to growth in the tourism sector along this route, in these towns and their hinterlands, and even across provincial boundaries. Many ideas for using rail transport to leverage more tourism products in the Central Karoo region has been identified but still needs to be implemented (Western Cape Government 2013b).

Beaufort West can be considered as the Northern Gateway to the Western Cape as for most tourists the town is not an end destination. Most tourists pass through the area and only stop in Beaufort West for refuelling or refreshments. The newly-developed Karoo Tourism Strategy recognises the importance of regional co-operation to drive a successful Karoo tourism product. The strategy lists a

competitive and efficient infrastructure, which includes transport, as vital for a successful tourism strategy implementation. The infrastructural requirements include:

- Improvement of provincial road links between Karoo towns;
- Effective signage on national and provincial roads;
- Improved municipal road infrastructure and urban streets;
- Resuscitation of rail connections between towns, and between the Karoo and main cities;
- Revitalisation of railway stations as key transport hubs for rail, taxis and private vehicles;
- Establishment of a commercial airport, with scheduled flights, at Beaufort West, to serve the rest of the Karoo; and
- Establishment of other Karoo airports as spokes, interacting with Beaufort West as a hub. (Karoo Development Foundation 2012: 14).

Furthermore, “an air transport strategy is critical for the Karoo. Combined with car rental options at Karoo airports, it will open up the Karoo to much greater levels of tourism. Beaufort West, which is centrally located in the Karoo, is an obvious choice for an airport with scheduled flights” (Karoo Development Foundation 2012: 18). The reasons why Beaufort West would be the choice for an airport are:

- The logistics infrastructure in the town (N1 highway and main north-south rail link);
- Beaufort West is centrally located in the Karoo, equidistant between the Western Cape, Northern Cape and Eastern Cape. A radius of 200 km from Beaufort West will reach the following towns: Prince Albert and Merweville in the Western Cape; Graaff-Reinet and Aberdeen in the Eastern Cape; Sutherland, Fraserburg, Victoria West, Carnarvon and Strydenburg in the Northern Cape; and
- Beaufort West is one of the three strongest retail centres in the Karoo (on a par with Graaff-Reinet and Calvinia (Karoo Development Foundation 2012: 45).

There is a potential for route-based tourism as there are enough routes with enough good attractions along them (Heath 2012). Beaufort West would act as a base from which to explore these routes as four of the five routes are within 300 km of the town. Activities would include a museum of the Karoo, a cultural tourism centre, adventure centre, fossil centre, architectural tours, mountain tourism, Anglo-Boer War tourism, literary tourism, endemic plants tourism, agri-tourism. However, they may offer limited appeal to the mass tourism market as the attractions are more likely to appeal to particular niche markets for which the Central Karoo must compete. Furthermore, these routes will have to involve a measure of cross-border collaboration with the Eastern Cape and the Northern Cape. An indispensable ingredient for the development of these routes is the development of an integrated public transport system for the region centred on safe, efficient and functioning rail transport and a bus service. The bus service would form part of a future Central Karoo Mobility Strategy that would not only service towns along the N1 but also serve Merweville and Prince Albert. The Central Karoo Mobility Strategy has been completed (Western Cape Government 2013c) but remains unimplemented.

The Central Karoo Mobility Strategy project proposes a system of subsidised community transport services which operate at regular but infrequent intervals (daily to monthly) depending on the routes conceptualised. Well-planned transport services would go a long way towards providing a dignified form of mobility to a large number of the residents in the Central Karoo, thereby ensuring better access to healthcare, education, social services and markets, and increasing accessibility to areas of greater opportunity whilst simultaneously unlocking economic opportunity.

An important transport market along the N1 is the long-distance minibus-taxi services which operate north- and south-bound routes from Cape Town, Bloemfontein, Johannesburg and Pretoria. A heavy presence of long-distance minibus traffic between Cape Town and the Eastern Cape via Aberdeen (and back) is experienced every week. This long-distance minibus-taxi traffic is especially heavy from Thursday evenings to Monday mornings, with minibus-taxis stopping at petrol stations in Beaufort West to refuel and for passengers to alight. Historically, the long-distance minibus-taxi traffic on this route peaks at month-end, and at the beginning and end of the Easter and year-end holiday periods. Economic opportunity can be unlocked by tapping into this market (Western Cape Government 2013c).

The Karoo Basin has been identified as an area that has vast reserves of shale gas which can be extracted through a process known as hydraulic fracturing, commonly known as fracking. The local economic benefits of fracking, if any, have not been established yet (Western Cape Government 2012).

In spite of sharing the N1 as a transport corridor it seems unlikely that these Central Karoo towns can be regarded as an integrated economic region. The viability of any provincial investment initiatives will in all likelihood have to be considered for each town separately rather than for the region as a whole. Moreover, the development prospects for these towns do not look promising.

All four towns have a low human capital capacity. The percentage 20-65 year olds with at least grade 12 and higher is low for all four towns. The growth in high skilled labour is also low. The number of formal retail outlets and service sector businesses is of the lowest in the province. In addition to these indicators of low private sector human capital potential, these towns also tend to score low on the *Institutional Index*.

It is therefore difficult to avoid the impression that, apart from transport related investments which serve the province's broader growth objectives, it is unlikely that public investment by the province in these towns will be economically viable in the sense of promoting inclusive growth through job creation and productivity improvements. The potential for innovation and the human capital capacity to mobilise local assets and resources appear severely limited.

7. CONCLUSIONS & RECOMMENDATIONS

In this study the growth potential and socio-economic needs of settlements in the Western Cape outside of the Cape Town metropolitan area was determined using quantitative data (e.g. factors relating to socio-economic, economic, physical-environmental, infrastructure and institutional aspects). The results of the quantitative analyses were combined with qualitative information (e.g. stakeholder engagements) to identify potential interventions that might unlock latent potential within settlements and regions.

Several spatial indices and indicators were developed in the study. These products are ideal for informing regional (e.g. provincial, inter-municipal and inter-settlement) decision-making. From interactions with users of the previous GPS products it became clear that these products were not always applied in the most effective and appropriate manner. Many users simply applied the overall composite *Growth Potential Index* for widely differing decision support requirements and ignored the other more targeted indices and indicators that the GPS provides. Several spatial indices and indicators aimed at supporting a range of decision support activities were thus developed in the GPS2013. It is critical for users to understand that the thematic and composite indices provide an overall perspective of growth potential and socio-economic needs in the Western Cape, with its primary application to inform and guide strategic and cross-cutting decisions at a provincial level. These composite indices are, however, not the only decision support tools available for more detailed applications such as informing specific programmes within individual departments.

In addition to the composite and thematic indices, the GPS2013 also demonstrates the value of "indicator bundles" that can more effectively inform decisions relating to specific departmental programmes and objectives. At a fourth level of application, individual indicators may in some cases also be appropriate for guiding specific interventions, programmes and projects.

The main value of the GPS2013 is that it combines various, often disparate data sets in a consistent manner to produce a suite of products (maps, tables and graphs) that can be used to inform strategic decisions at various levels (e.g. provincial, regional and local). The GPS2013 products should, however, not be used in isolation from other spatial planning tools, strategies and documents as it provides only one (quantitative) perspective to growth potential and socio-economic needs. Some important aspects relating to the growth preconditions and innovation potential of settlements cannot be measured or quantified. It is, for instance, impossible to adequately quantify and model the entrepreneurial spirit of individuals or the vulnerability and resilience of communities. It is also very difficult to reflect the impact of a critical dimension such as biodiversity on overall growth potential through a single indicator. Such data was deliberately excluded in order to prevent the impression that the growth potential index fully considered all aspects relating to environmental sensitivity. The quantitative GPS2013 results should thus be interpreted

in combination with existing environmental data and the GPS2013 results can and should thus in no way be used to motivate any individual development applications or to circumvent normal environmental authorization processes. The economic viability of each intervention and project must consequently be assessed taking all the available information into consideration.

In conclusion, the project team recommends that:

1. The GPS2013 products be used in the appropriate manner to inform decisions at various strategic levels (as described above);
2. Cognizance be taken of the perceived impediments of growth highlighted during stakeholder engagement; and
3. The potential interventions suggested by participants of the public participation process be considered for unlocking latent growth potential of settlements and regions.

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