

SPACE AND PLANNING IN SECONDARY CITIES

REFLECTIONS FROM SOUTH AFRICA

EDITORS

LOCHNER MARAIS

VERNA NEL



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sb **SUNBONANI
SCHOLAR**

Space and planning in secondary cities: Reflections from South Africa

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FOREWORD

The research collaboration between South African Cities Network (SACN) and the University of Free State's Centre for Development Studies dates back to 2013 whence we embarked upon a series of explorations based on the notion of differentiated urban governance. The collaborative sought to ask new questions about a supposed-category of municipalities that were then being referred to as "secondary cities." These were loosely being conceptualised as a set of second tier, fast growing cities which required special attention and could be considered for metropolitan status in the near future. However, there was little evidence to support any of these suppositions and assumptions. The series of studies and reports that followed over the past half-decade have aimed to elucidate these ideas: of the category, and of the unique characteristics that require special treatment or – as we have come to refer to it – differentiation. The book *Secondary cities and development* (Marais et al. eds, 2016) was the first book to emerge out of the body work. The emerging body of work has collectively been somewhat of a flagship in what is a relatively new area of scholarship.

We at SACN are therefore delighted to see this second book emerge, drawing upon the fourth in the series of studies. This particular study asked a critical question in the advent of the national Integrated Urban Development Framework (IUDF; RSA CoGTA, 2016) and the New Urban Agenda (UN Habitat, 2016). It asked whether the "spatial transformation" concept which is a key objective of these policies is somehow unique in the case of these secondary or intermediate cities? The rich set of case studies that were



undertaken now form the basis for this book, telling a complex story about space, about planning, and about what it may take to embed and advance the intentions of the national urban agenda in particular places.

The work of Professor Lochner Marais and his network of collaborators at Free State and other national universities has enabled important, new empirical work focused on exploring these kinds of questions which are crucial to our grounded understanding of urban dynamics in South Africa. These are insights that we believe to be important for scholarship and – of great importance to the SACN – for the policy and practice audiences who are actively engaged in steering urban growth and development.

Geci Karuri-Sebina, PhD

Executive Manager

South African Cities Network

2018

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TABLE OF CONTENTS

LIST OF FIGURES	xvi
LIST OF TABLES	xvii
CONTRIBUTING AUTHORS	xiii
ACRONYMS	xix
CHAPTER 1 SECONDARY CITIES AND SPATIAL TRANSFORMATION IN SOUTH AFRICA	
1.1 Context and background	1
1.2 Secondary cities and research and policy in South Africa	4
1.3 South Africa's spatial planning legacy and theoretical understandings of the problem	7
1.4 Post-apartheid spatial policy	10
1.5 The shape of the study	14
1.5.1 The problem, and our questions	14
1.5.2 The aims of this book	15
1.5.3 Methods	16
1.5.4 Terms used in this book	18
References	21
CHAPTER 2 PLANNING IN COMPLEX SPACES: AN ORDERLY AND PREDICTABLE WORLD?	
2.1 Introduction	25
2.2 From confidence to complexity: The dismantling of certainty	27
2.3 Conceptualising complexity	29
2.3.1 Complex adaptive systems	29
2.3.2 Socioecological systems	31
2.4 Implications for planning in complex systems	33
2.4.1 Relational space	33

2.4.2	Relational time	34
2.4.3	Adaptive co-evolution	35
2.4.4	Collaborative and adaptive planning and leadership	36
2.5	Conclusion	37
	References	38

CHAPTER 3 DRAKENSTEIN: THE SHINING PEARL IN THE SHADOW OF THE CAPE TOWN METRO

3.1	Introduction	41
3.2	Literature review	44
3.2.1	Complexity	44
3.2.2	Urban sprawl	44
3.2.3	Gated estates	46
3.3	Study methods	47
3.4	Background to Drakenstein Municipality's spatial problems	49
3.5	The extent of sprawl	53
3.6	Policy for spatial containment	54
3.7	Conclusion	60
	References	62

CHAPTER 4 LEPHALALE: THE ENERGY HUB OF THE LIMPOPO PROVINCE

4.1	Spatial planning for the Limpopo energy hub	67
4.2	Mining booms and busts	69
4.3	Settlement planning and housing policy for mining towns	71
4.4	Profile of Lephalale	72
4.4.1	Economic trends	72
4.4.2	Demographic trends	73
4.4.3	Municipal finance	74
4.4.4	Infrastructure	74

4.5	Spatial change and spatial planning	75
4.5.1	Spatial change	75
4.5.2	Spatial planning challenges	77
4.5.3	Spatial development framework	77
4.5.4	Analysis of the spatial development framework	78
4.6	Spatial transformation and complexity	80
4.7	Conclusion	82
	References	83

CHAPTER 5 MAHIKENG: A REMOTE PROVINCIAL CAPITAL WITH A TURBULENT HISTORY

5.1	Introduction	87
5.2	Study method	89
5.3	Complexity of planning in Mahikeng	90
5.4	Planning in a difficult space	91
5.5	Policy and planning frameworks	97
5.6	Profile of Mahikeng	98
5.6.1	Demographics	98
5.6.2	The economy	100
5.6.3	Service provision	102
5.6.4	Governance	103
5.6.5	Planning for spatial transformation	104
5.6.6	Lack of support	108
5.6.7	Lack of capacity	108
5.7	Conclusion	109
	References	111

CHAPTER 6 MATJHABENG: PLANNING IN THE FACE OF THE FREE STATE GOLDFIELDS DECLINE

6.1	Introduction	115
6.2	Spatial change and spatial planning	117
6.2.1	Context and changes in Matjhabeng	117
6.2.2	Welkom’s economy and global market forces	122
6.2.3	Spatial changes in Matjhabeng, 1990–2013	124
6.3	Spatial planning in Matjhabeng: 1994–2018	125
6.3.1	The 2005/2006 spatial development framework	126
6.3.2	The 2013 spatial development framework	128
6.3.3	The 2015 Matjhabeng by-laws	130
6.3.4	Precinct plans	131
6.4	The difficulty of making realistic plans in a situation of economic stagnation	132
6.5	Conclusion	135
	References	136

CHAPTER 7 MBOMBELA: A GROWING PROVINCIAL CAPITAL AND TOURISM DESTINATION

7.1	Introduction	141
7.2	Spatial change and spatial planning	143
7.2.1	Spatial and population change	143
7.2.2	The city’s economy	146
7.2.3	Municipal finance	147
7.2.4	Municipal infrastructure	148
7.2.5	Areas under traditional authorities	149
7.2.6	Main spatial challenges	150
7.3	Spatial development framework	151
7.3.1	Spatial priorities and plans	152
7.3.2	The N4 Maputo corridor	153

7.3.3	Participatory planning	154
7.3.4	Balancing urban and rural land development	155
7.3.5	Integrated development	156
7.4	The pattern in economy	157
7.5	Conclusion	158
	References	159

CHAPTER 8 MSUNDUZI: SPATIALLY INTEGRATING KWAZULU-NATAL'S DIVERSE CAPITAL

8.1	Introduction	163
8.2	Profile of Msunduzi	165
8.2.1	Socio-economic	165
8.2.2	Economic	166
8.2.3	Services	167
8.2.4	Governance	168
8.3	Spatial transformation	169
8.4	Spatial development framework	171
8.4.1	Overview	171
8.4.2	Comment on the contribution of the spatial development framework to spatial transformation	174
8.5	Spatial transformation, conflicting rationalities and complexity	175
8.6	Conclusion	176
	References	177

CHAPTER 9 POLOKWANE: A SECONDARY CITY WITH A 2020 VISION

9.1	Introduction	179
9.2	Socio-economic profile	181
9.2.1	Demographics	181
9.2.2	Economic overview	182

9.2.3	Municipal finance	183
9.2.4	Municipal infrastructure	184
9.3	Factors affecting spatial change in Polokwane Local Municipality	186
9.3.1	Settlement hierarchy	186
9.3.2	Corridors and transportation	188
9.3.3	Traditional land	188
9.3.4	Water and sanitation infrastructure	189
9.4	Spatial development framework	190
9.5	Assessment of the spatial development framework	192
9.6	Conclusion	198
	References	200

CHAPTER 10 RUSTENBURG: BOOM AND BUST IN A MINING TOWN

10.1	Introduction	203
10.2	From farming centre to platinum city	204
10.3	Spatial planning problems in Rustenburg	206
10.4	Difficulty translating principles into practice	212
10.5	Internal dynamics that hinder spatial transformation	213
10.6	External dynamics that hinder spatial transformation	214
10.7	Conclusion	215
	References	216

CHAPTER 11 SOL PLAATJE: PLANNING ON AN OLD MINING SITE

11.1	Introduction	219
11.2	Spatial transformation challenges	225
11.3	Spatial and development planning	230
11.3.1	Spatial development framework	230
11.3.2	Quality of the spatial development framework and planning process	232
11.3.3	Degree of implementation	233

11.4	Spatial planning and complexity lessons	234
11.5	Conclusion	236
	References	236

CHAPTER 12 STELLENBOSCH: CHANGE COMES TO A HISTORICAL UNIVERSITY TOWN

12.1	Introduction	239
12.2	Complexity as a lens to assess spatial planning instruments	241
12.3	Intentions, perceptions and realities	243
12.4	Interconnected nodes and car-free transport	244
	12.4.1 Optimal land use	247
	12.4.2 Inclusive economic growth	252
	12.4.3 Resource custodianship	255
	12.4.4 Promotion of agriculture and food production, and preservation of heritage	257
12.5	Conclusion: Complexity in spatial planning for Stellenbosch Municipality	258
	References	261

CHAPTER 13 COMPLEXITY THEORY AND SPATIAL CHANGE IN TEN SECONDARY CITIES

13.1	Introduction	265
13.2	Understanding spatial change in the ten cities	266
13.3	Contradictions between between policy intentions and actual results	270
13.4	Uncertainties, disruptions and slow change	273
13.5	Disjuncture between plans and practice	282
13.6	Influence of interest groups	283
13.7	Conclusion	284
	References	285

LIST OF FIGURES

Figure 1.1	Location of the ten case study areas in South Africa.....	17
Figure 3.1	The extent of gated development urban sprawl to the south of the N1..	50
Figure 3.2	Total values of taxes from five income categories compared with the area they cover.....	57
Figure 3.3	Average property valuations according to suburbs in Paarl	58
Figure 4.1	Lephalale land cover, 1990 and 2014	76
Figure 5.1	Location of Mahikeng in South Africa	93
Figure 5.2	Broad land uses in Mahikeng	94
Figure 5.3	Mahikeng settlement growth, 1889–2014.....	96
Figure 5.4	Large houses and properties on Mahikeng tribal land.....	96
Figure 5.5	Spatial development framework for Mahikeng Local Municipality.....	106
Figure 5.6	Spatial development framework for urban Mahikeng	107
Figure 6.1	Projected mining employment, 2017–2034, excluding Tetra4 gas, and possible mining of tailings.....	121
Figure 6.2	Real and nominal price of gold per troy ounce	123
Figure 6.3	Extract of 2005/2006 spatial development framework for Matjhabeng..	127
Figure 7.1	Urban growth of Mbombela Local Municipality from 1990–2016.....	145
Figure 9.1	Polokwane Municipal Area – Increase in Land Cover, 1996–2014	185
Figure 9.2	Corridors in Polokwane	187
Figure 10.1	Urban sprawl in Rustenburg, 1990 and 2014.....	208
Figure 11.1	Kimberley central business district around the Big Hole	223
Figure 11.2	Fragmentation of Kimberley, with Roodepan to the far north.....	228
Figure 11.3	Municipal and mining land in Sol Plaatje	229
Figure 12.1	Stellenbosch town land cover, 1990–2013/2014	246
Figure 12.2	Growth of densely settled land and population.....	249
Figure 12.3	Area of residential building plans passed in Stellenbosch municipality, 1999–2016	250
Figure 12.4	Area of industrial and office and shopping building plans passed in Stellenbosch Local Municipality, 1999–2016	254

LIST OF TABLES

Table 1.1	Distribution of the world's urban population by size, 2014 (%)	3
Table 1.2	Population by settlement category in South Africa, 1996–2011	4
Table 1.3	Case studies selected for this book	18
Table 3.1	Drakenstein Municipality's population increase compared to formal residential area increase over 15 years	53
Table 3.2	Urban sprawl index for Drakenstein Municipality	54
Table 5.1	Mahikeng's population	99
Table 5.2	Educational level of population 20 years and older	100
Table 5.3	Percentage contribution to the economy per sector: Employment and gross value added.....	101
Table 5.4	Mahikeng household indicators	102
Table 6.1	Key indicators	118
Table 7.1	Mbombela municipal income and expenditure, 2006/2007 and 2015/2016.....	147
Table 7.2	Profile of household infrastructure in Mbombela, 1996–2016.....	148
Table 8.1	Msunduzi's economy (1996–2015) compared to that of KwaZulu-Natal province, 2010.....	167
Table 8.2	Percentage of households receiving basic services, 2011 and 2016	168
Table 9.1	Economic contribution and growth by sector in Polokwane, 1996–2015	183
Table 9.2	Household access to municipal services in Polokwane, 1996–2016	184
Table 10.1	Rustenburg household services	210
Table 13.1	Growth of densely settled land in ten secondary cities, 1990 and 2014..	268
Table 13.2	Racial desegregation in ten secondary cities compared with the metropolitan areas of South Africa, 1996 and 2011	271
Table 13.3	Economic size, economic growth and economic structure in ten secondary cities, 1996–2015.....	274
Table 13.4	Municipal income indicators for ten secondary cities.....	276
Table 13.5	Municipal expenditure in ten secondary cities	277
Table 13.6	Employment, household income and dependency in ten secondary cities.....	280

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ACRONYMS

CBD	Central business district
CCTV	Closed-circuit television
CoGTA	Department of Cooperative Governance and Traditional Affairs
GDP	Gross domestic product
GIS	Geographic information system
IDP	Integrated development plan
IUDF	Integrated Urban Development Framework
LM	Local Municipality
NDP	National Development Plan
NWP	North West Province
NWP DP	North West Province Development Plan
PDA	Potential development areas
RDP	Reconstruction and Development Programme
RSA	Republic of South Africa
SACN	South African Cities Network
SANBI	South African National Biodiversity Institute
SDA	Spatial development areas
SDF	Spatial development framework
SPLUMA	Spatial Planning and Land Use Management Act
Stats SA	Statistics South Africa
USI	Urban sprawl index

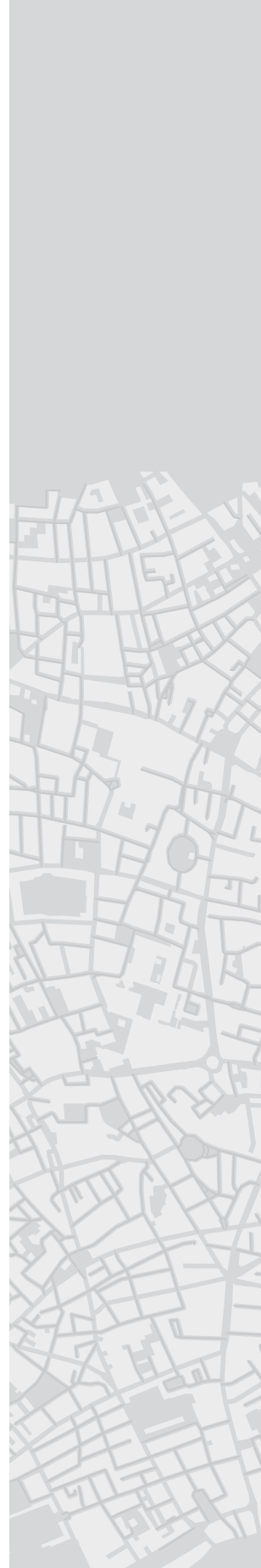
CHAPTER 1

SECONDARY CITIES AND SPATIAL TRANSFORMATION IN SOUTH AFRICA

**Lochner Marais, Danie du Plessis,
Verna Nel & Jan Cloete**

1.1 Context and background

Worldwide, the importance of secondary cities is increasingly being acknowledged. Decision makers, however, see large cities as more important because they have a bigger population and a bigger role in the economy. They fail to appreciate the function of secondary cities and their role in national development. But most people in the world do not live in large cities. Policymakers, and academics too, must start taking notice of the smaller cities. This book draws their attention to some of the smaller cities that have been unfairly neglected in South Africa.



Much of the early debate about secondary cities centred on defining them. The literature uses various terms for secondary cities (the term used in this book), such as ‘intermediate city’, ‘small city’ or, in Europe, ‘lagging region’ or ‘peripheral region’ (Rodríguez-Pose & Dahl Fitjar 2013). The general consensus is that definitions of these cities are usually country-specific and based on a combination of factors related to size, function (including its regional role) and location (Van der Merwe 1992).

Size can refer to either the population or the economy. Secondary cities are usually cities whose population and economy are slightly smaller than those of the largest cities. Their *function* and their contribution to the national economy have been identified in early research on secondary cities (Rondinelli 1983). Some considered their function to lie in their second-tier status, while others emphasised their intermediate nature, noting that these cities mediate between the larger cities and the rural areas (Bolay & Rabinovich 2004). The literature emphasised their regional function and their role in rural development (De Boeck et al. 2009; Hardoy & Satterthwaite 1986). Many secondary cities provide higher-order educational, health and financial services to their rural hinterlands, such as private hospitals, private schools and the regional offices of large businesses (often banks and insurance companies). Secondary cities may link cities to create a network of urban areas (Roberts 2014). Many have an international link. Their function is generally related to their *location*, most of them being near a larger city or a border between countries.

Almost all ten of South Africa’s secondary cities whose case studies form this book, are smaller than the eight major metropolitan areas in population size, economic output and number of international economic links. However, they all have important regional functions, providing higher-order economic services and promoting rural development. Their size and function (and regional function) are in most cases related to their location.

Table 1.1 shows the world population distribution across city sizes, showing that nearly 50% of the world’s urban population live in cities with fewer than 500 000 people.

TABLE 1.1 Distribution of the world's urban population by size, 2014 (%)

Area	10 million or more	5 to 10 million	1 to 5 million	500 000 to 1 million	Fewer than 500 000
World total	11.7	7.8	21.3	9.4	49.8
More developed regions	12.5	6.9	20.0	9.1	51.5
Less developed regions	11.4	8.0	21.7	9.5	49.3

Source: Compiled from United Nations (2015a)

The literature has much to say about how strongly secondary cities have been affected by globalisation and decentralisation. Many have not only a regional but also a global service function. Increasingly, faraway global markets determine their futures, whether they grow or decline. Many of them have global links via mining or manufacturing. More recently, some have also benefited from the knowledge economy (Marais et al. 2016a). Their global links bring them opportunities but can also make them vulnerable, as many of them are at the mercy of the ups and downs of a single industry.

The original policies for secondary cities, in the 1960s, were national strategies (Rondinelli 1983). These had limited success (Bolay & Rabinovich 2004). One of the main problems was that these policies were top-down strategies that seldom took into consideration the trends then current in countries' settlement patterns and the evolution of national urban systems. In the mid-1980s, decentralised planning was adopted to solve the problems caused by these top-down strategies. Cities had to assume greater responsibility for their own futures by planning and collaborating with local and global businesses. However, the vulnerability that accompanies global trade complicated long-term planning. Although secondary cities often lack the human resources to plan for a changing world, they have no choice but to accept and manage their global dependence to create sustainable futures.

1.2 Secondary cities and research and policy in South Africa

South Africa has a well-developed system of urban areas but no formal official definition of the term ‘secondary city’. As the intent was not to debate the definition issue, we used the National Treasury’s working definition to select the sample of cities for this book. Table 1.2 provides a categorisation of settlement types across South Africa’s urban system, defined somewhat arbitrarily by the National Treasury on the basis of population size alone.

TABLE 1.2 Population by settlement category in South Africa, 1996–2011

Settlement category	1996		2001		2011	
	N	%	N	%	N	%
A. Metropolitan areas	13 997 887	34.6	16 188 421	36.1	20 371 095	39.3
B1. Secondary cities	5 832 308	14.4	6 475 805	14.5	7 881 662	15.2
B2. Large towns	3 000 682	7.4	3 341 625	7.5	3 818 514	7.4
B3. Small towns	5 370 740	13.3	5 979 593	13.3	6 983 890	13.5
B4. Mostly rural	12 294 059	30.3	12 807 760	28.6	12 746 621	24.6
Total	40 495 676	100.0	44 793 204	100.0	51 801 782	100.0

Source: Statistics South Africa (Stats SA 2013)

Note: As South African municipal boundaries include both urban and rural populations, the population numbers supplied above also include people who are living on both urban and rural land. We used the National Treasury’s settlement categories.

According to South Africa's 2011 census, nearly eight million people were then living in secondary city municipalities. This is approximately 15% of the country's population and nearly two million more than in 1996. Most of these secondary cities experienced rapid population growth between 1996 and 2011, while a few suffered a population decline or experienced slow growth. For more on this topic, see Marais and Cloete (2017) and Marais and Nel (2016).

Most research in South Africa follows the pattern of the international literature in concentrating on the large cities. The largest metropolitan areas, Cape Town, Johannesburg, Tshwane (Pretoria), Ekurhuleni (Germiston) and eThekweni (Durban), were the focus of research attention in South African urban studies (Visser 2013), to the neglect of the other three, Buffalo City (East London), Mangaung (Bloemfontein) and Nelson Mandela Bay (Port Elizabeth). A search by Marais et al. (2016b) found only a few studies of secondary cities, and the next tier of about 20 to 25 'large towns', as reflected in Table 1.2, has received even less research attention. Despite excellent attempts to understand South Africa's space economy (Van Huyssteen et al., 2009) research on smaller urban settlements remain limited.

The first notable research on secondary cities was done in the early 1990s. In the mid-1980s the apartheid government was looking for a way to manage urbanisation after the lifting of influx control. Van der Merwe (1992) suggested that a secondary city strategy might be a solution. Further notable research on secondary cities came from the Urban Foundation (1994), which pointed out that secondary cities did not receive adequate policy attention. However, apart from some case studies that happened to be about secondary cities but were often unrelated to the secondary cities theme, not much new work was done for nearly two decades.

Research interest in secondary cities has, however, been growing since 2011. Topics covered by some of the studies are changes in the rank-size distribution patterns in the evolution of the South African urban system (Morudu & Du Plessis 2013), the role of secondary cities in South African population migration trends (Geyer & Geyer 2014) and empirical

demonstration of the valuable role secondary cities play in managing urbanisation in South Africa (Marais & Cloete 2017). The interest was triggered by the granting of metropolitan status to Mangaung and Buffalo City in 2011. Many secondary cities now wanted to know what they had to do to obtain metropolitan status. This prompted the South African Cities Network (SACN) to initiate and fund research on secondary cities, focusing on how government should treat secondary cities differently in policy and programmes. Their first work defined and profiled secondary cities, with the aim of starting a conversation (SACN 2012).¹ Next, the SACN commissioned six case studies aimed at a better understanding of secondary cities. This led to a publication called *Outside the core: Towards understanding intermediate cities in South Africa* (SACN 2014) and culminated in *Secondary cities and development*, edited by Marais et al. (2016a). The initial SACN research prompted further work (Marais & Cloete 2017; Marais et al. 2014; Marais et al. 2017). Recently, two further studies commissioned by the SACN have investigated the R293 towns created under apartheid.² The first is based on two case studies from metropolitan areas (SACN 2016a) and the second is a study of spatial transformation in secondary cities (SACN 2017). The present volume is the culmination of the lessons learned and draws on case studies from the SACN (2017).

Besides being the focus of research, secondary cities have also received increasing policy attention in recent years. This has included renewed international attention in the New Urban Agenda (United Nations 2015b), which identifies secondary cities as a key mechanism for coping proactively with urban growth and stresses the importance of strengthening their capacity to manage sustainable urban development. The South African

1 The SACN is a network of the nine major urban areas in South Africa, i.e. the eight largest metros and Msunduzi (Pietermaritzburg).

2 The 'R293' towns (from Regulations for the Administration and Control of Townships, Proclamation R293 of 1962) were established by the apartheid government to redirect urbanisation away from the main urban areas. These towns had to be integrated into the 'homelands' but were often managed by the apartheid state.

government, urged by research and political pressure to expand the number of metropolitan areas, is in the process of designing a new strategy for secondary cities. Their decentralised planning responsibilities for local development planning and local strategic planning are now guided by spatial development frameworks (SDFs).

1.3 South Africa's spatial planning legacy and theoretical understandings of the problem

South Africa's colonial and apartheid history left its urban areas with a distinct spatial legacy. The race-based city planning ideologies resulted in racial segregation, low densities and sprawling suburbs, and in many cases left the urban poor stranded on the periphery. The need for spatial restructuring is, to a large extent, because of this legacy. Apartheid planning represented high levels of social engineering; it created hardships, marginalised lower-income households and was a direct burden on city economies. Often, planning responses in the post-apartheid period only served to perpetuate these problems. In this regard, Todes (2006:50), for example, noted that despite some exceptions "cities continued to develop along socially divided lines, but class began to replace race as a significant socio-spatial divide". For further discussion of the spatial effects of apartheid planning, see Dewar (1977), and for an in-depth study of apartheid social control in cities, see Turok (1994).

Many of the spatial problems in urban areas are still apparent more than 20 years into the new democracy. Some have worsened. As cities have grown, travel time from home to place of work, for example, increased between 2003 and 2013 (Stats SA 2014). The percentage of workers who spent more than 15 minutes walking in order to reach transport increased from 11% in 2003 to 14.7% in 2013 (Stats SA 2014). The household travel survey also found that in 2013 it took people longer to reach their nearest taxi rank, bus rank or train station than it did in 2003, and that the percentage who took 15 minutes or longer to walk to the nearest taxi rank stood at 22.3% in 2013 – up from 17.6% in 2003 (Stats SA 2014).

Over the years, different planning paradigms influenced planning practices in South Africa (Harrison et al. 2008; Mabin & Smit 1997). Before 1948, the government often cited health reasons for planning and segregation and accordingly eradicated slums (Parnell 1993). After 1948, town planning became the dominant means of shaping urban segregation (Mabin & Smit 1997). By the mid-1940s, planning jargon and documents included the term 'modern' (Harrison et al. 2008). Parnell and Mabin (1995) referred to the link between modernity and planned segregation as a "peculiar form of modernism". Modernity, segregation and strict land use principles guided apartheid planning that was often influenced by 'garden city' planning ideas from Europe. African townships were dislocated from the main urban areas by what South Africans came to know as 'green belts' or 'buffer strips' (Mabin and Smit, 1997). Black workers struggled with the cost- and time-management implications of travelling long distances between their homes and their places of work. Black townships also often had monofunctional land use, that is, the land was earmarked exclusively for residential use.

By the mid-1980s, resistance to apartheid planning was mounting. In academic circles (often influenced by international trends), the emphasis shifted towards the liberal ideal of compact cities with higher densities, spatial integration and good public transport (Dewar & Uytendogaardt 1991). Land use planning, a prominent feature of apartheid planning, was underplayed by liberals and harshly criticised by progressives (Harrison et al. 2008). This agenda, driven by non-governmental organisations with the support of some academics, included social transformation and challenged apartheid segregationist policies. Some of the ideas from the progressive response contributed to critical planning theory in the post-apartheid dispensation. This theory emphasised the influences that the markets, power and inequalities bring to bear on planning and planning outcomes. The Urban Foundation, established in 1976, also criticised race-based planning from a business perspective (Urban Foundation 1994).

Many of the planning ideas that have surfaced since the start of democracy came from the liberal response. The main problem with both the form of modernist planning peculiar to apartheid and the liberal planning theory is that their arguments are linear; the basic assumption being that better planning leads to better spatial outcomes. Harrison et al. (2008:11), when comparing apartheid and liberal responses, found that “both were essentially modernist, based on the assumption that it is possible to envision an alternative and more desirable future and to achieve this; and both conceptualised space as an element that can be objectified and manipulated to particular social and economic ends”. These similarities also spilled over into the implementation of local government SDFs. According to Harrison et al. (2008:11), SDFs “remain dominated by a particular set of spatial concepts (edge, corridor, node)” and “the prime implementational mechanism is still, potentially, the development of a control system”. The critical planning theory also tends to emphasise linear relationships. For example, the emphasis on unequal power relationships highlights but one aspect of the larger reality of spatial planning.

Although the complexity theory has been used to study urban change and spatial transformation, it is often underutilised in South Africa. Chapter 2 of this book provides a broad overview of the complexity theory and the themes it brings to the fore in the context of city planning and development. We have identified seven of these themes for this book. First, *certainty is not always possible*. We do not take the postmodernist position that it is not at all possible, but we do emphasise how complex and uncertain planning strategies are. While they often support one another, they could, in other contexts, be contradictory. Second, *experiences differ*: different groups of people will experience spatial transformation differently and exercise their powers differently. Third, cities face risks of disruption. City *vulnerability* is therefore an important consideration in many of our case studies. Fourth, *context and time* are crucial elements in understanding complexity. Spatial transformation guidelines may differ according to the locality and the timeframe. Fifth, change is often *an incremental and slow process*. Small changes can have large consequences and large changes might not have the desired result. Sixth, *citizen participation*

and good leadership are essential in urban development, since planning in South African government departments is acknowledged to have been complex and fragmented. Finally, an emphasis on ‘good planning practice’ can have *unintended consequences*. We motivate these themes in more detail in Chapter 2 and apply these concepts to our case studies. However, all the case studies do not necessarily follow this framework to the letter.

In using the complexity theory, we do not intend to make any grand statements about what is wrong – although the case studies have revealed that, to some extent, urban segregation and exclusion are still with us – or how it must be remedied. Our emphasis is rather on understanding patterns of spatial change (the rate at which it occurs and the factors that drive it), the factors contributing to spatial change and the complexity associated with it. We want to determine the extent to which spatial change is the result of a planning pathway created by negotiation in 1994, rather than the result of a radical move away from the historical legacy. We are furthermore interested in the contradictions and the parallel processes and patterns, though contradictory, the nature of urban conflict and the power relations that determine spatial outcomes, and the contexts in which change occurs or fails to occur. Our argument in this book is that although unequal power relationships are real and often have negative spatial consequences, the reality on the ground is often far more complicated than can be accounted for by any single factor.

1.4 Post-apartheid spatial policy

Spatial segregation and exclusion continue despite the range of spatial legislation and spatial instruments that have been introduced to overcome the spatial legacy of apartheid. The *State of South African cities report 2016* (SACN 2016b) says:

- Spatial transformation is critical for the growth and development of cities and it affects economic access and efficiency.
- The current urban development trajectory has negative characteristics that prevent cities from achieving their spatial visions.

- To transform space effectively, the power relations, institutions and capabilities in the system also need to be transformed.
- Short-term and long-term strategies are required for land, spatial planning, housing and human settlements, and transport and mobility.
- Though regulations and public instruments can be used, market interventions by various actors are also necessary.

Spatial transformation of South African cities, including ‘compacting’ and ‘integrating’ them, is a vital part of post-1994 spatial planning policy (Todes 2006). However, despite a proliferation of policies and demonstrations of strong intent, the debate about meaning and application is ongoing (Pieterse 2003; SACN 2016b).

The term ‘spatial transformation’ has featured prominently in policy documents since 1994, meandering from the initial White Paper on Reconstruction and Development in 1994 to the Integrated Urban Development Framework (IUDF) in 2016. The Reconstruction and Development Programme (RDP) was the first post-1994 policy to direct the progress of the National Transformation Strategy, which was intended to integrate the different organs of government in all three spheres of government in a concerted drive towards the national goal of renewal (Republic of South Africa [RSA] 1994). Though the RDP was not very specific about spatial transformation, it did however introduce the principle that land for housing development had to be suitably located in relation to economic opportunities and social amenities. The Development Facilitation Act of 1995 was promulgated shortly after the introduction of the RDP, with the purpose of establishing special measures to facilitate and speed up the implementation of the RDP (RSA 1994).

The Urban Development Framework (RSA 1997) was designed in response to the RDP’s call for national guidelines for making South Africa’s cities into sustainable human settlements. The Urban Vision for 2020 included several development programmes for mixed land use and remodelling the apartheid city, linking its component parts by means of high-density activity corridors, township upgrading and urban infill (RSA 1997). The post-1994

reforms reached a milestone in the promulgation of the Local Government: Municipal Systems Act in 2000 and the subsequent Local Government: Municipal Planning and Performance Management Regulations (2003). These ushered in an era of what was called 'joined-up' governance and introduced municipal integrated development planning, the aim being to ensure efficient delivery of infrastructure and social facilities through the temporal and spatial coordination of development and investment initiatives at all three government levels. To give effect to the principles contained in the Development Facilitation Act of 1995, municipalities now had to supply an SDF as part of their integrated development plan (IDP).

Breaking New Ground (RSA Department of Housing 2004) shifted the focus from providing housing to developing human settlements. This was not a new policy directive. It reinforced the Department of Housing's vision, which was "to promote the achievement of a non-racial, integrated society through the development of sustainable human settlements and quality housing" (RSA Department of Housing, 2004:7).

The 2012 National Development Plan (NDP) 2030 was the next significant step in the evolution of spatial planning. Chapter 8 focused on human settlements. Its themes were justice, efficiency, quality, sustainability and resilience, and it aimed to transform human settlements. It acknowledged that many of the features of its spatial vision had already been known and accepted in 1994 but said that it had been difficult "to translate the vision into implementation and meaningful spatial outcomes" (RSA National Planning Commission 2012:286).

The biggest post-1994 development in the planning system was the promulgation of the Spatial Planning and Land Use Management Act (SPLUMA) in 2013. This Act requires the development of principles and norms and standards for spatial planning, land development and land use management, and prescribes the preparation and content of an SDF at various settlement levels. It empowers local municipalities to drive their spatial planning.

The IUDF builds on various chapters in the NDP and specifically extends Chapter 8 of the NDP dealing with the transformation of human settlements and the national space economy. The NDP says South African cities have the following new roles: to tackle the spatial legacy of exclusion, distorted growth patterns and inefficiencies; to unlock the development potential through targeted investment in economic and social infrastructure; to guide and inform infrastructure investments that support long-term inclusive growth; and to facilitate the kind of coordination between government and various actors that shapes and informs spatial development.

The IUDF's main aim is spatial transformation. It outlines a 'new deal', which is about maximising a city's potential by integrating and aligning investments in a way that will improve its shape. It is about changing the existing city footprint to produce a compact, coordinated and connected city, using 'transit-oriented development' and other urban planning strategies. The four goals of the IUDF are *spatial integration* (forging new spatial forms in settlements, transport, and social and economic areas); *inclusion and access* (ensuring that people have access to social and economic services, opportunities and choices); *growth* (using urban dynamism for inclusive, sustainable economic growth and development); and *governance* (enhancing the capacity of the state) (RSA Department of Cooperative Governance and Traditional Affairs [CoGTA] 2016).

The IUDF also identifies policy levers as the means to implement the four identified goals. These policy levers are the integration of urban planning and management, integrated transport systems to improve the mobility of urban population, universal access to urban infrastructure; efficient land and urban governance and management; inclusive economic development; empowered, active communities; and sustainable finances.

Since 2002, the SACN has made useful contributions to the towards conceptualising the need for spatial transformation in its four 'State of the Cities' reports (2002, 2006, 2011 and 2016). The fourth report (SACN 2016b) acknowledges the change in the scale and appearance of South African cities and the improvement in city dwellers' quality of life in the past 20 years.

However, it also notes the elements of inefficient spatial form, such as the location of public housing developments that continues to encourage urban sprawl, the scarcity of economic opportunities close to where most people live, and conversely, the shortage of affordable accommodation close to economic opportunities. The 2016 Report's chapter on spatial transformation identifies examples of the direct and indirect costs of fragmentation and spatial dislocation. It costs more to provide services in sprawling settlements than in denser ones. People who live in sprawling settlements have higher transport costs, in terms of both time and money. And there are environmental costs, such as air pollution caused by increased vehicle use.

The 2016 Report set out spatial principles, processes and outcomes. The principles are to be translated into action by processes such as interventions in the built environment, improved governance, increased productivity, sustainability and inclusivity. The outcomes for the cities should then be accessibility (which includes affordability); mixed incomes and mixed use; a good, safe urban public realm; a lively mix of land uses; and integration and cohesion (racial, economic and social). Overall, the report viewed spatial transformation within the bigger context of urban sustainability.

The IUDF's vision for South Africa's urban areas recognises that the country has different types of cities and towns, each with different roles and requirements (RSA CoGTA 2016). This provides the rationale for research to investigate the neglected secondary cities.

1.5 The shape of the study

1.5.1 The problem, and our questions

In line with the global shift towards decentralised planning, South African legislation requires local governments to prepare IDPs, including SDFs, to serve as their principal strategic planning instruments to guide and inform all municipal planning, budgeting, management and decision-making in five-year cycles. The SDFs should be aligned to the needs of spatial transformation as outlined in the various policies discussed above. But to date, the results of

these good intentions have been limited. As we noted above, most research to date has been on spatial change in the larger cities, so there is a dearth of information about this process in the smaller ones. In this book, we ask directly and indirectly what is holding back spatial transformation in South Africa's secondary cities. We ask this question in the context of the reality that is driven by increasing complexities. Our book highlights the lack of approaches and methods that take cognisance of such complexities.

Through our case studies we ask:

- Do the policy proposals for spatial transformation consider the complexities of spatial planning in secondary cities?
- Are there contradictions (non-linear realities) in policy and in the application of policy in secondary cities?
- How do municipalities plan for uncertainties, disruptions or slow change?
- How do the different local plans and priorities currently affect the key indicators of spatial transformation in secondary cities?
- How do different interest groups influence spatial planning in secondary cities and what are the intended and unintended consequences of their influence?
- Are there unintended consequences of the drive towards spatial transformation?

1.5.2 The aims of this book

In this book we analyse spatial planning in ten secondary cities in South Africa: Drakenstein, Lephalale, Mahikeng, Matjhabeng, Mbombela, Msunduzi, Polokwane, Rustenburg, Sol Plaatje and Stellenbosch (see Figure 1.1). We use the complexity theory as our theoretical foundation. Our three broad objectives are:

- To describe the nature of spatial changes in the case study cities and identify the mechanisms that tend to influence this change, with a view to understanding non-linear relationships and how planning often assumes linear relationships.
- To evaluate the quality and ability of SDFs as a policy mechanism with which to bring about change, frame a spatial understanding and inform the spatial transformation agenda in the context of uncertainty and vulnerability.
- To understand the contradictions and unintended consequences of spatial planning and practice in these secondary cities.

1.5.3 Methods

The ten secondary city case studies that form the basis of the book were developed by analysing documents (mostly SDFs), conducting interviews in these cities, and studying relevant data (infrastructure access, housing, population movements) on spatial change in these cities. The case study authors interviewed respondents from the public sector, business and civil society, presented the case studies at a team workshop and incorporated the comments made at the workshop. Table 1.3 and Figure 1.1 show that the cities were selected from all South Africa's provinces – other than Gauteng (functionally a city region) and the Eastern Cape – and cover a diverse range of functional roles. Authors had the liberty to analyse, present and structure the data and their chapters. However, the authors had to take into account our Complexity Theory lens.



Source: Author's own (2018)

FIGURE 1.1 Location of the ten case study areas in South Africa

TABLE 1.3 Case studies selected for this book

Selected city	Province	Category of secondary city
Drakenstein	Western Cape	Service centre
Lephalale	North West	Mining
Mahikeng	North West	Service centre
Matjhabeng	Free State	Mining
Mbombela	Mpumalanga	Large, semi-diversified
Msunduzi	KwaZulu-Natal	Large, semi-diversified
Polokwane	Limpopo	Large, semi-diversified
Rustenburg	North West	Large, semi-diversified (but mining dominant)
Sol Plaatje	Northern Cape	Service centre (historically mining)
Stellenbosch	Western Cape	Service centre

Source: SACN (2017)

1.5.4 Terms used in this book

We use a range of concepts in this book and we define these concepts below. We opted to use the concept ‘secondary city’ for this book, although researchers and policymakers also use the idea of an ‘intermediate city’. The term secondary city emphasises the secondary status compared to the main metropolitan cities. The name intermediate city highlights the functional role of these cities as they mediate between metropolitan cities and smaller urban areas. The South African support programme for these small cities is also titled “the intermediate city municipalities support programme.” However, for this book, we use the term secondary city, because international and South African academic literature use the term extensively (Marais, 2016; Marais et al. 2014; 2016a). Yet, we emphasise the functional role of secondary cities in the book.

Because we use the term secondary city as a way to explain the second-tier status of these cities, we also need to define the first tier cities or metropolitan areas. The Local Government: Municipal Structures Act (Act 117 of 1998) categorises these cities as Category A or metropolitan municipalities. The Act describes the attributes of Category A municipalities as areas of complex and diverse economic agglomeration with high population density; an intensive movement of people, goods and services; and multiple central business districts (CBDs). Alternative terms used in the literature are 'large city', Metropole, metropolitan municipality, 'primary city' and 'major city'. In 2001, the South African government declared only six Category A municipalities: Cape Town, Ekurhuleni, eThekweni, Johannesburg, Nelson Mandela Bay and Tshwane. In 2011, the government added Mangaung and Buffalo City. Although there is indeed a debate about the additions, we regard these cities as the metropolitan areas for this book.

One of the consequences of apartheid planning has been the low densities of South African cities compared to cities elsewhere in the world (Gelderblom and Kok, 1994). At the same point, there is indeed a debate about adequate densities, how to define compact cities and whether densification is a good idea (Neuman, 2005). In addition to referring to the number of people per square kilometre, densification also relates to the densification of land uses. For Katz (1994), higher densities and compact cities help to improve resource efficiency, business costs, thresholds, reduce pollution and promote community building. Considering the history of South African cities, we use the term compact cities and densification as an attempt to increase the number of people per square kilometre in the cities under discussion. Where needed, we use the definition to extend the discussion of the densities to land uses.

Closely related to the above is the term infill development. The term generally means creating settlements within the existing boundaries of a city and not extending the city boundary. SPLUMA and the National Development Plan do not use the word and the Integrated Urban Development Framework uses it once. Marais and Ntema (2013) describe the in situ upgrading of the Freedom Square informal settlement in Mangaung as a spatial infill project.

This upgrading project filled existing space between settlements and did not relocate people to the periphery. However, the policy documents use the word spatial integration on numerous occasions. In this book, infill development is one form of spatial integration. Spatial integration also includes aspects of social integration and social cohesion. However, spatial transformation also refers to the integration of urban areas using transport, information and communications technology and economic opportunities. It is also in this broader context that we use the concept of urban integration in this book. Urban sprawl is the opposite of infill and integration. Urban sprawl refers to the continued extension of the urban boundaries of cities through urban development (Marais et al., 2019). Although several reasons contribute to urban sprawl in South Africa, we highlight two main reasons in this book: informal settlements and high-income (often security driven) estates.

In dealing with the historical problems associated with apartheid planning, several concepts developed to deal with the historical concerns of segregation and fragmentation. The concept of spatial transformation has raised to prominence and has received substantial attention in South African research (Harrison & Todes, 2015; Williams, 2000). The IUDF sees spatial transformation as an essential outcome of policy. For Williams (2000), spatial transformation means deliberately changing the form, substance and dimensions of urban space to reflect a more equitable social order. Our book also makes this assumption, but shows how difficult such intent is. This book uses the term mainly in connection with policy positions, to reflect policy intent. In addition to the notion of spatial transformation, the NDP uses the concept of spatial efficiency (RSA, 2012). The NDP uses the term 'spatial efficiency' to mean supporting productive activity and jobs and minimising burdens on businesses, making commuting efficient, encouraging circulation of goods and services, and implementing regulatory procedures that do not impose unnecessary costs on developments. We also use this context of spatial efficiency in the book.

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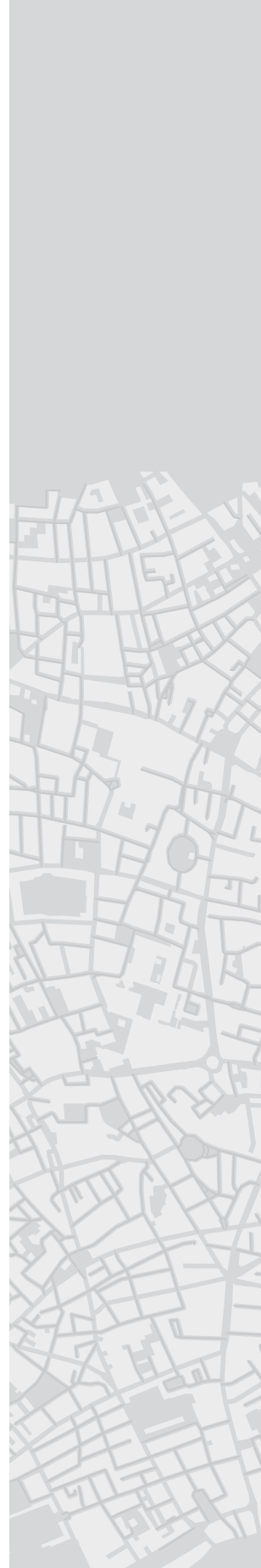
CHAPTER 2

PLANNING IN COMPLEX SPACES: AN ORDERLY AND PREDICTABLE WORLD?

Verna Nel

2.1 Introduction

We tend to believe we live in an orderly and predictable world. The sun rises each morning. When we press a light switch, we get light. We are comforted by these certainties. But we also accept that much is unpredictable. We know that despite progress in weather forecasting we cannot expect accuracy more than a few days in advance, nor can we confidently predict what the stock market will do next month. This all seems obvious. But policy makers nevertheless often fail to factor uncertainty into their planning decisions, nor



do they consider the possibility of unexpected outcomes. They think a plan is sound and acceptable to all, only to find the community thinks differently, after experiencing the unintended consequences of the plan.

Despite our human desire to manage our world tidily, to deal with one problem at a time, equipped with all the information we need, life tends to present us with 'messy' problems. A messy problem is not just difficult to solve, it is stubborn, presenting us with uncertainty and conflict (Armson 2011). Urban managers are often faced with problems that are not just messy but 'wicked'. The expression 'wicked problem' had long been in use in the social sciences, but Rittel and Webber (1973) were the first to formalise the notion, distinguishing between 'tame' and 'wicked' problems. A 'tame' problem will have a straightforward solution, but a 'wicked' problem presents planners with a mass of difficulties of all kinds.

A wicked problem is one that is hard to define because people cannot agree on its nature, cause and possible solutions. The problem may be described in many ways and attributed to many causes. Shortage of information and a clash of values and interests are among the causes of such a problem. The difficulty of defining the problem or its solution may make it difficult to recognise a solution when it has been found. The consequences and implications of the solution may only emerge years later. Complicating the matter, a wicked problem may be a symptom of another wicked problem. Because wicked problems are so complex, each is unique and needs to be solved in a unique way (Norton 2012). Tried-and-trusted solutions will not work. When it comes to wicked problems in planning, the city must find a solution to the problem as well as manage the consequences of trying to solve it. Spatial transformation in a complex world is one such wicked problem, as demonstrated in the case study chapters in this book.

Wicked problems reflect a world whose complex systems generate surprises with long-term effects and thwart our attempts at rational, orderly planning or decision-making. Cities are complex systems made up of intersecting social, economic, ecological and political systems. Healey (2007:3) describes

the planning environment as “multiple webs of relations that transect and intersect an urban area, each with their own driving dynamics, history and geography, with highly diverse concerns about, and attachment to, the places”.

The dominant planning model since the 1950s, generally known as ‘rational-comprehensive’ planning, is based on logical and rigorous decision-making (Muller 1992). But as planning for spatial transformation is seldom so clear-cut, many alternative models have been proposed to deal with uncertainties and complexities. Planning in a complex system is challenging, but not impossible. It requires moving away from a modernist, linear approach to accepting uncertainty and complexity, in line with the shift in the natural and social sciences over the past century. To function amid complexity, planners must understand the features and behaviour of social-ecological systems. This chapter not only provides a theoretical overview of complexity, but also provides a perspective to question the policy, regulatory and planning tools that cities have to achieve transformation in the midst of complexity and numerous wicked problems.

2.2 From confidence to complexity: The dismantling of certainty

Newton’s laws of motion are still used today, for instance to predict the movement of planets and guide spacecraft. In Newton’s clockwork universe, given enough information the future can be calculated with accuracy. This knowable, predictable universe, where effects have rational causes, can be reduced to the laws of physics in ‘a theory of everything’. In this view, the world is conducive to control, uniformity, rigidity and rational policy. Because the material world is subject to laws of physics, it is tempting to believe that biological, social and economic systems can be similarly regulated (Geyer & Rihani 2010).

These ideas drove the Industrial Revolution and the Enlightenment, but the early twentieth century saw the beginnings of a suspicion that the clockwork model was incomplete. Einstein’s theory of relativity demolished

the concept of absolute space and time and introduced relational space-time. The Heisenberg uncertainty principle postulates that there is a limit to what we can know. It states that we can accurately measure either the position or the velocity of a sub-atomic particle but not both simultaneously (Peat 2007:922). Poincaré and others working on non-linear dynamics (also known as chaos theory) identified limits to predictability. Smuts (1926) and Von Bertalanffy (1976 [1968]), who is considered the founder of general systems theory, advocated a holistic perspective of the world (Gleick 1998; Peat 2007).

These theories ushered in a gradual recognition that the universe is inherently uncertain, that there are limits to knowledge, that cause and effect are not always well defined and, as the whole may be greater than sum of its parts, taking a system apart is unlikely to reveal all of its behaviour. Teisman et al. (2009:5) argue that “a reductionist approach solely focusing on the parts does not generate an understanding of the whole”. The recognition of uncertainty, complexity and incompleteness now extends to the social sciences and economics. This was the beginning of the “end of objectivity” (Peat 2007:926). It should be noted that reductionism has, of course, proven to be a useful method in modern science for systems that can be isolated or simplified. This is not the case with planning a city, as its systems are irreducibly complex (Cilliers 1998).

Improvements in technology, and particularly in computing power, have improved our modelling of non-linear, open, dissipative systems. These systems exhibit both order and dynamism. They allow some predictability amidst uncertainty and require a holistic perspective. Studies of ‘chaotic’ systems have revealed the effects of small differences in initial conditions, ‘strange attractors’, fractal patterns in things as diverse as shore-lines and the price of cotton, and how simple rules can generate complex behaviour (Gleick 1998).

A systemic view of cities and regions is not new. Nearly 50 years ago, planners such as McLoughlin (1969) and Chadwick (1971) advocated a systems approach to planning. However, they still conceived the systems as equilibrium-seeking, space as a container and the region as an object in the

plan. It is only in the past 30 years or so that planners have begun to adopt a relational rather than rational-comprehensive approach to planning (Graham & Healey 1999).

2.3 Conceptualising complexity

We live amid complexity in both the natural and human world and need to understand such systems if we are to work in and with them. The following sections discuss complex adaptive systems and one subset of these, social-ecological systems.

2.3.1 Complex adaptive systems

Complex adaptive systems are ubiquitous wherever there is life. Although there is no single definition of complexity, there is largely consensus on the features of a complex adaptive system, some of these being change, capriciousness, self-organisation and the incompressibility of the system's information. Complex adaptive systems are made up of many interacting elements or agents; the larger the number of these, the less amenable the system is to mathematical analysis. These systems are dynamic; they change and adapt over time through the interaction of the elements or agents. Complexity arises from the interactions between these constituent parts. These interactions and their relationships determine the structure of the system and result in self-organisation where assemblies emerge without external instruction. Self-organisation enables the system to control itself, and to innovate, regenerate and adapt. Holling (2001:391) noted that the complexity of living systems of people and nature "emerges not from a random association of a large number of factors but rather from a smaller number of controlling processes" and that the self-organisation of such systems is created and maintained by this "small set of critical processes".

'Emergence' is an important feature of a complex adaptive system, best explained as 'the whole is greater than the sum of the parts' or as Portugali (2016:6) noted, "complexity is a property of the global system but not of the parts". Complexity arises from the aggregate behaviour of the system, as

in the collective behaviour of a market or a colony of ants. Another feature of a complex system is its ability to self-organise, i.e. to adapt to changing circumstances by interactions between its parts. In socioecological systems, adaptation is facilitated by people's reflexivity and their ability to think, learn, forecast and respond. Their cognitive abilities make it possible for them to think about both past and future and hence to plan.

Most complex adaptive systems are in dynamic equilibrium, with local diversity and system-wide stability, yet they are capable of abrupt changes (such as stock market crashes), with 'black swan' events occurring more often than would be predicted by a normal distribution (Taleb 2007). This is evidence of non-linearity, where the impetus of an event is not always equal to its effect on the system and arises from the nature of the feedback loops in the system. Feedback can amplify (snowball) or dampen (balance) the stimulus; possibly moving the system from one state to another as it reaches a tipping point. Complex systems are often stable for long periods and then rapidly transform into a new state where they become stable again, a process described as 'punctuated equilibrium'.

Because complex systems are open, with constant energy and information flows between the system and its environment, their boundaries are fuzzy and depend on the nature of the system being studied. Careful consideration must be given to determine the boundaries, which should include the largest spatial extent or time period in which the system has existed.

For more information on complexity and complex adaptive systems, see Cilliers (1998), De Roo (2010), Geyer and Rihani (2010), Grunau and Schönwandt (2010), Gunderson and Holling (2002), Gunderson et al. (2008), Holland (1992, 2014), Holling (2001), Kinzig et al. (2006), Meadows (2008), Norberg and Cumming (2008), O'Connor and McDermott (1997), Patorniti et al. (2017), Portugali (2008, 2011, 2016), Roggema (2014), Teisman et al. (2009) and Walker and Salt (2006),

2.3.2 Socioecological systems

Human and ecological systems (social-ecological systems) are complex adaptive systems and consequently, so are cities (Nel 2009). While social-ecological systems and cities thus share the attribute of complex systems, they also have traits that must be understood if we are to guide them in a desired direction.

To understand such a system over space and time, it is essential to understand that interactions shape the system and its structure tends to be hierarchical. Such systems may include scale-free networks that are self-similar at multiple scales (fractal) or networks with a few well-connected, dominant nodes that facilitate information flows, but which may be vulnerable to disruptions (Holland 1992, 2014). In a municipal context, among the multiple interacting sub-systems of the social system are the regulatory system. The regulatory system comprises regulations, law enforcement processes and other legal instruments, economic systems which influence employment, incomes, property values and municipal revenue, political systems determining policy and resource allocation and administration systems. Urban planning and management interacts with these and the wider social-ecological system.

Social-ecological systems occur across temporal and spatial scales. Gunderson and Holling (2002) use the term 'panarchy' to describe a system that consists of numerous interrelated systems operating at different speeds over diverse spatial scales. Smaller – more local – systems tend to function faster and over shorter distances while the larger systems move more slowly and cover larger distances. Consequently, the patterns and processes of the systems will vary with the scale of the system. Mismatches between systems at different functional, temporal and spatial scales can result in a lack of adaptive capacity and impoverish the system. Cumming et al. (2006:8) suggest that scale mismatches in planning arise from inconsistent management decisions, inappropriate responses to situations, conditions that favour vested interests but do not benefit the majority (such as historical mining rights), changes

in technology and values, and regulations or social norms developed under different circumstances that no longer apply but have not adapted (such as communal land tenure or traditional customs).

The dynamics of the nested systems are described as 'adaptive cycles', which comprise phases of growth, collapse and renewal. The properties that shape the adaptive cycle are the potential or 'wealth' of the system, its connectedness and concomitant rigidity or flexibility, and hence its sensitivity to change that affects its capacity to adapt (i.e. its resilience) in the face of perturbations or shocks. The early stage of the cycle is one of 'exploitation' or exploration and entrepreneurship. This gradually evolves into a 'conservation phase' where the system becomes highly connected, controlled and rigid. The low resilience of an inflexible system means that a disturbance can lead to abrupt change – 'creative destruction' – with the release of the accumulated capital that now permits reorganisation, renewal and a new cycle (Walker and Salt, 2006).

Although these phases normally occur sequentially, this is not essential: renewal without collapse is possible, as are poverty and rigidity traps. A poverty trap occurs when the potential of the system is so eroded that it degenerates into an irreversible state where its potential, connectedness and resilience are low. A rigidity trap occurs where there is a high degree of social control, little flexibility or opportunity for novelty. Inertia and rigidity also occur where the energy and resources required for change exceed the benefits, or the benefits of change (often for elites) are too limited to warrant the effort (Holling 2001; Gerrits et al 2009).

The larger, slower moving systems usually maintain overall stability, while experimentation and renewal are facilitated by the smaller, more rapidly changing systems. However, it is possible for pressure from a smaller system to change the larger system, in a 'revolt'. More often, the larger systems influence the smaller systems during renewal, enabling them to 'remember' the past, a phenomenon allied to path dependency or 'hysteresis', where the history of a system influences its future behaviour. The 'fast' variables are often easy to spot, but slow-moving variables may be critical to the long-term future of the

system. These dynamics of nested systems often give rise to unanticipated consequences. Understanding the dynamics of the system and identifying windows of opportunity are critical if cities are to influence it (Holling & Gunderson 2002; Simmie & Martin 2010).

2.4 Implications for planning in complex systems

Planning is about linking the present to a desired future, by arranging resources and opportunities in space and phasing them over time, amid uncertainty. Humans, with their ability to learn, respond, adapt and reflect, are uniquely positioned to manage within complex systems (Teisman et al. 2009; Portugali 2016).

Working within a complex system requires modes of thinking and doing that are different from those of modernist, rational planning, which assumes absolute space and time, recognisable cause-and-effect and certainty. Instead, cities must acknowledge that they and their hinterlands “emerge and change from the bottom up, out of the interaction of their agents; that as complex systems, cities are always in a far-from-equilibrium state, and that they change by means of self-organisation” (Portugali 2016:16). The advantage of a systems approach is that it “offers a more comprehensive understanding of cities and their design... in contrast to current approaches that only offer a piecemeal understanding of cities” (Patorniti et al. 2017:46). Municipalities need to appreciate the effects of local dynamics and external influences on the system. They need to adopt new perspectives, particularly on space and time. They need to practise adaptive co-evolution, and collaborative and adaptive planning and leadership. These topics are discussed in the following four subsections.

2.4.1 Relational space

To plan in a complex system, we must conceptualise space as relational. A complex system consists of “networks, places and flows, in which multiple relations, activities and values co-exist” (Healey 2007:1). Policy makers must see a space as not just a container for activities but as something produced by

people as they interact in it. People and groups experience a space differently and give different meanings to it (Healey 2006). If planners concentrate on one interpretation or set of meanings to the exclusion of others, or privilege one perspective, they may put some people at a disadvantage. Adopting an absolute or two-dimensional perspective of space, as many spatial plans do, will not promote justice. Planners should give careful attention to boundaries, as a boundary not only includes but also excludes. Boundaries may not only have implications for investment and regulation but may also affect distribution of resources.

Taking a relational view of space recognises that proximity does not imply relationship. Instead, interactions occur at multiple scales with different implications for the system. Events, conditions or actors in a global system can affect local affairs, and conversely local events or conditions or actors can affect the global system. Often the scale of the solution is at the scale of the problem, but the solution may exist on a larger scale. Cities must be aware of other spatial scales that affect or are affected by the system, including possible mismatches between administrative and functional scales.

2.4.2 Relational time

Complex adaptive systems are dynamic, with different parts changing at different timescales. Some components of a city, such as its built form, change slowly, while others, such its traffic flows, fluctuate daily. People remember the past but can also conceive of possible futures. Perceptions and experiences of time are relational. A multi-national company may take a long-range view of investment decisions, while an informal trader may take those decisions daily. It is thus critical for planners to adopt a relational view of time (Graham & Healey 1999).

Planners must be aware that the planning scale they are using and that of the system, i.e. the city they are planning for, may be misaligned. Also, people may want to hold onto the past, or traditional customs may no longer be useful or

beneficial under changing circumstances. Planners must also be aware of the stages in a city's adaptive cycle and its propensity to change, as actions taken at one phase of the cycle may be ineffective at another (Landman et al 2019).

Some examples of possible causes of misalignment are, short-term perspectives linked to political terms of office, ill-timed interventions, and the assumption that a common time schedule will serve to align multiple development processes in a complex system. These failures to take relational time into account can cause inefficiency and prevent appropriate responses by the system. Furthermore, locally optimal solutions that ignore wider impacts may result in long-term problems. Conversely, disrupting existing processes may create an opportunity to destabilise the system to enable it to shift to a new, preferred state.

2.4.3 Adaptive co-evolution

Cities are in a constant state of becoming, adjusting to internal and external pressures. Accordingly, planners, being part of that system, need to keep adapting and evolving with the system. To do this they need to take a flexible approach to planning and policy-making in both processes and organisations. Incremental learning, with reiterative strategies subject to continuous evaluation, will enable them to adjust to changing circumstances (Teisman et al 2009). Inevitably, there will be tensions between rational, linear, regulatory planning – essential for confidence and control over negative side-effects – and the responsive, collaborative, fluid planning that is required in a situation of dynamic complexity. De Roo (2012) points out the contrast between the need for order and coherence to maintain the system and the need for diversity, robustness and adaptability amid change.

Planners can learn from communal builders such as ants or bees. The lesson is not to *impose* order but to make it possible for citizens to create their own order; not to build, but to enable citizens to build. The planner's job is to deal with problems that arise from the citizens' activities rather than to control the activities themselves. Roggema (2014:106) calls this 'swarm planning'. This is planning at the system level but "with the freedom of individual landscape

elements to shape (and self-organise) the system". He says the results may be "fundamentally unpredictable", but he argues that we can "be confident that the system, when performing swarm behaviour, reaches a higher adaptive capacity".

Planning within a complex adaptive system requires the planner to merge standard technical and rational planning processes, which are based on the assumption of certainty and predictability, with alternative planning processes such as scenarios or the strategic choice approach (Friend & Hickling 2005). To merge these methods requires keeping a delicate balance between the activities of small groups and the broader community, and bureaucratic processes must be maintained.

2.4.4 Collaborative and adaptive planning and leadership

Planning that takes relational time and space into account requires mutual learning between authorities, their planners and the communities with which they plan. It entails creating shared opportunities for learning in networks that access diverse forms of knowledge through collaboration between stakeholders. Adaptive management views policy-making as a series of experiments that promote learning, building and strengthening relationships, and an understanding of opposing views. It also devolves some decision-making to local groups who have a direct interest in, and intimate knowledge of, the situation. However, Armitage et al. (2008:96) caution that capacity building "should create enabling conditions for learning which will inevitably involve a concern with issues of power, culture, institutions, worldviews and values" and that local customs and perspectives should be respected. Furthermore, vulnerable members of the community should be empowered to deal with social, livelihood or political risks, and cognisance must be taken of existing and emerging power relations.

Innes and Booher (2010:206) believe that adaptive governance is a collective responsibility that requires stakeholders and leaders to "develop knowledge, expertise, and new organizational forms in response to what we learn"

and they say that adaptive learning “is critical and must be continuous”. Building networks with strong, positive interactions can amplify change through feedback.

One crucial role for planners is that of leadership. Leaders need to build trust, help people to develop a joint vision, deal with conflicts, garner support for change, and smooth the transition between knowledge and action. In this process leaders need to encourage experiments and interactions between stakeholders, facilitate sense-making and help to stabilise the system when a change has been made (Olsson et al. 2006).

2.5 Conclusion

Managing a city in a complex urban system is much like manoeuvring through a maze of wicked problems. Ignoring or over-simplifying their complexity may bring unintended and unwanted consequences. Understanding the functioning of a social-ecological system is essential to navigate it and nudge it towards the desired outcomes. Contrary to the assumptions behind rational planning processes, cities need to accept that the urban system is constantly evolving. Thus, urban development processes must be flexible and iterative, yet there must be sufficient certainty in the proposals to encourage investment.

However, despite their uncertainty and unpredictability, complex adaptive systems have features in common that enable intervention. Urban managers who recognise the spatial and temporal scale of the system and its stage in the adaptive cycle can plan effectively. Using feedback and communication networks, they can amplify or dampen the system’s effects to make their plans acceptable and successful. Participatory planning and development is important, so the city must acknowledge the diversity in the system – the multiple interests, different forms of knowledge, different meanings and different views of time and space. To devise acceptable planning proposals, the city needs to harness the benefits of diversity. Urban managers and planners have to be special kinds of leaders, part of the system, and at the same time outside it, guiding it towards a desired state – a delicate balancing act that is only possible with a systems perspective.

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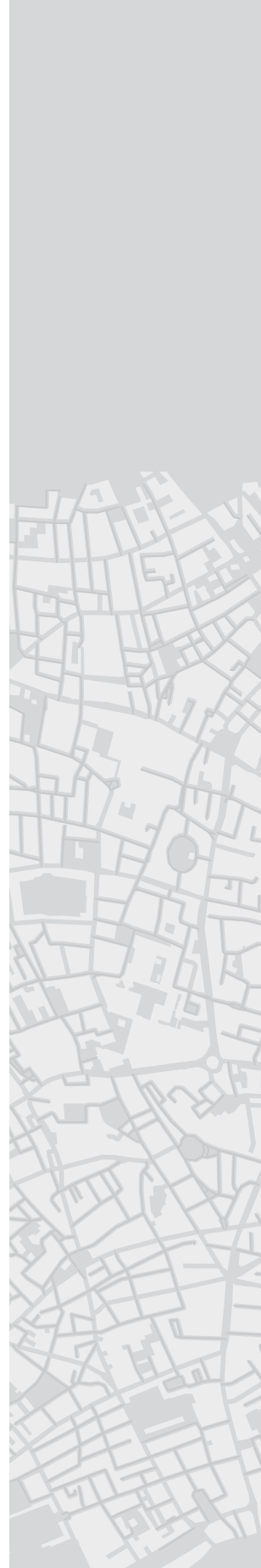
CHAPTER 3

DRAKENSTEIN: THE SHINING PEARL IN THE SHADOW OF THE CAPE TOWN METRO

Ronnie Donaldson & Anele Horn

3.1 Introduction

The term ‘transformation’ is used loosely and interchangeably with ‘urban restructuring’ (SACN 2016:58). According to Williams (2000:169), transformation is “a spatially defined, socially embedded process ... an interrelated series of materially driven practices, whereby the form, substance and overall dimensions of urban space are purposefully changed to reflect the principles of a more equitable social order”. Williams (2000:169) further described transformation as a “fluid process of change, organically linked to the past, present and future”. At a conference on spatial transformation of cities hosted by the SACN in 2014,



it was suggested that transformation of cities implies both spatial and social transformation and requires “the collaboration and support of all role players (public sector, private sector, business and residents)” where politics is seen as “a governance issue, and space is contested” (SACN 2014:18). It was argued that the challenge of urban transformation is to “balance the long-term urban vision of inclusive, liveable, sustainable and resilient cities with the short-term realities of urban spaces designed for segregation, migration and poverty” and that the need is for “a shared vision and collaboration across government spheres, the private sector and citizens” (SACN 2014:8). Issues typically found on the spatial transformation agenda are: the isolation of segments of the population and their exclusion from economic opportunities, which prevents them from using economic commodities equitably and sharing in welfare opportunities; the ever-increasing commuter distance to urban economic centres and the costs involved; the inertia of spatial racial integration; spatial inequality and the mismatch between incomes and densities in spatially homogeneous areas; rampant and uncoordinated spatial growth and its consequences for agricultural productivity, environmental conservation and the cost of infrastructure services; and the high costs for business entrepreneurs entering the local economy (see for example, Du Plessis & Boonzaaier 2015; Harrison & Todes 2015; Musvoto et al. 2016; Odendaal & McCann 2016; Todes 2012; Turok & Watson 2001; Van Huyssteen et al. 2010).

The literature on urban spatial transformation deals primarily with South Africa’s main urban centres. Scant attention has been paid to secondary cities’ attempts to undo the spatial legacy of apartheid. A pioneering book by Marais et al. (2016) on six secondary cities in South Africa (City of Matlosana, Emalahleni, Emfuleni, George, Polokwane and Umhlathuze) concluded that because of their economic vulnerability, narrow economic base and smaller economic size, these cities are more likely than larger metropolitan areas to suffer from poor local relations between government and businesses. It found that ongoing racial divisions and the lack of coordinated planning between municipalities and the private sector was hampering their economic growth. Their urban landscape reflected the failure of local governments to reconcile the various role players’ planning imperatives, for example by endorsing the market-driven gated estates that exacerbate uncontrolled expansion. The case

studies of the six cities found high levels of path dependency in the plans for local economic development. Historical development paths were still being followed, partly because these cities are fairly small, and their industries use old technologies, factors which make it hard to take a new route. But this is not a problem specific to South Africa. The book drew on international literature to illustrate the difficulty of changing a city's historical pathway, even with concerted effort at local level.

South Africa has seen a proliferation of legislation and spatial policies to limit urban sprawl and contain the physical expansion of urban areas since democracy in 1994. The Development Facilitation Act of 1995, the NDP of 2013, the SPLUMA of 2013 and the IUDF of 2016, for example, all promote the principles of compact urban development and increased densification. But despite these policies, the pattern of growth continues to be 'business as usual'. It is this planning phenomena that will be the golden thread throughout this chapter.

Paarl, named for its rounded granite mountain, 'Pearl Rock', lies about 60 km north-east of central Cape Town. In 2002 it was formally renamed Drakenstein Local Municipality (hereinafter referred to as LM for all municipalities in this book). Typical of the divergence observable in the post-apartheid era is the way this municipality's main urban centre, Paarl, has sprawled to the south (mainly in the form of market-driven gated developments) and the north (mainly in the form of lower income and informal housing). Despite this spreading urbanisation, the Drakenstein LM has always aimed to preserve its rural character, and this aim still features prominently in its most recent SDF (Drakenstein LM 2015). This chapter uses an urban sprawl index (USI) that compares cadastral, land use and population data over time to assess the extent of urban sprawl in this municipality. Following on from a literature section on spatial dynamics in a post-apartheid secondary city milieu and an explanation of the USI methodology, the chapter discusses how the political and administrative history of Paarl shaped the Drakenstein LM and gave rise to some of the difficulties it experiences today. The data obtained are then analysed and findings deliberated in the context of policy (especially the Spatial Development Framework [SDF]).

3.2 Literature review

In this brief literature review, we explain how complexity is to be understood conceptually in the context of urban planning and development. Two main features of urbanity that are pertinent to the case study (urban sprawl and gated developments) are then reviewed.

3.2.1 Complexity

One of the hallmarks of complex environments is uncertainty. Batty and Marshall (2012:44) said the “idea of the planned city as a knowable utopia is a chimera”, but they observed that we continue to plan “in the belief that the world will be a better place” if we try to fix problems. They advised that our planning must be “tempered with an awareness of the limitations of planning” and of “the evolutionary nature of urban change”. Planners often face ‘wicked problems’. A wicked problem is a problem that defies definition and has no easy answers, and whose solutions depend on the problem-solvers’ values and assumptions and often cause further problems (Rittel & Webber 1973). Friend and Hickling (2005) noted that an intricate planning environment and the conflicting values that guide planning proposals contribute to the ‘wickedness’.

Campbell (1996) described the planner’s problems as a triangle with three goals: social justice, economic growth and efficiency, and environmental protection. Between them, these goals give rise to three kinds of conflict: the property conflict, the development conflict, and the resource conflict. Pursuing one goal inevitably leads to clashes with the other two, placing planners in an invidious position. Managing the conflicts requires participatory planning, recognition of different experiences and values, and adaptive management (see Chapter 2 of this volume).

3.2.2 Urban sprawl

Urban sprawl is a spatial consequence of automobile dependency and fuelled by low-density suburban growth (Burchell et al. 2005; Torrens 2006, 2008) and peripheral township expansions in South Africa. It is an urban shape or

physical pattern that is observable and physically measurable. Gober and Burns (2002) identified five stages in the development of urban sprawl: First, there is agriculture with little urban development; second, agricultural land begins to be drawn into the urban area and signs of future development appear; third, visible signs of urbanisation reach a peak; fourth, exurban and transitional properties become absorbed into the expanding urban area; and in the fifth stage the former agricultural area has largely been taken over by urban development. They advised that plans to limit sprawl should ideally be carried out early, in stages one and two. Nine characteristics of sprawl are generally identified: leapfrogging development, scattered or randomised development, discontinuity, car-oriented design, clustering of commercial activities, decentralisation, low-density built environment, segregation of functions and land uses, and homogeneity of land use (Frenkel & Orenstein 2011; Torrens 2008; Venema 2016). It has long been recognised that the trend towards large-scale peripheral growth and away from the small-scale incremental pattern of cities in the past tends to increase uniformity and reduce diversity and character. The emphasis on personal security and privacy and safe streets for children has encouraged the proliferation of physical environments that favour control and separation over openness and interaction, causing fragmentation and diffusion and a built environment that is indifferent to the urban landscape.

Efforts to limit urban expansion and urban sprawl originated in the United Kingdom with the 'garden cities' movement, which aimed for planned decentralisation and greenbelts around major cities. That was the first attempt at steering population growth away from the city. The deliberate restraining of urban expansion has since been embraced by many cities in the global north, most notably in the Netherlands and the United States of America (Jenks & Burgess 2000; Jenks et al. 2008). Efforts have been less successful in cities in the global south. The literature on planning for urban development attributes this failure either to physical attributes of southern cities, such as exploding urbanisation and informal settlements (Cohen 2003; Jenks & Burgess 2000), or to inappropriate and outdated formal land use regulations being used in a social and political context that policymakers fail to grasp (Fekade 2000).

South African cities developed extensive peripheries, in the form of market-driven upper- and middle-income suburban development, on the one hand, or low-income state-assisted housing, illegal land occupations and informal settlements, on the other. The drive to compact and densify urban form became entrenched in the South African spatial planning policy from the early 1990s and is still viewed as doctrine; however, continued pressure for private estate developments and local governments' increased dependence on income from residential taxes have eroded the vigour with which these objectives are pursued. On these and other problems of South African urban peripheries, see Cirolia (2013), Du Plessis and Boonzaaier (2015), Harrison et al. (2008), Horn (2010), Nel (2011) and Rabe (2017).

3.2.3 Gated estates

A prominent feature of market-driven sprawl is the gated estate, also referred to as a 'gated development', 'gated complex' or 'gated community'. These space extensive developments eat up a large proportion of farmland on the urban periphery. Research on gated estates in South Africa strongly criticises this phenomenon, blaming it for spatial fragmentation, social exclusion, economic segregation and the inability of local authorities to render proper services (Durlington 2006; Hook & Vrdoljak 2002; Jürgens & Gnad 2002; Landman 2004, 2006a, 2006b; Lemanski 2006). Scholars noted that the primary reason for choosing to live in a gated estate in South Africa is fear of crime (Dirsuweit & Weifer 2006; Jürgens & Landman 2006; Landman & Schonteich 2002; Lemanski 2004, 2006). Most researchers have focused on only one type of gated community and its specific impacts. Jürgens and Landman (2006) noted the almost complete absence of policies on gated development at all three tiers of government. Some topics covered by studies of gated developments are morality and justice (Landman 2007), environmental sustainability (Landman & Du Plessis 2007), privatisation and implications for public space (Landman 2006a, 2006b), spatial implications (Lemanski 2004), ethnographic and cultural reasons for moving to gated developments (Durlington 2006) and the tourism potential of gated developments (Dirsuweit & Schattauer 2004). However, very few studies

have looked at the aspect of urban management and planning (Harrison & Mabin 2006 and Landman 2007 are two examples) and no study has investigated the actual value such developments add to a city's broader tax base (an argument often used by developers).

Very few studies have engaged with urban development in Paarl, the secondary city that is the topic of this chapter. A few master's studies have been done, for example on densification (Van der Linde 2000), economics (Slinger 2007) and mall decentralisation (Venema 2016). Two studies have looked at the tourism angle, investigating reasons for attending the city's Cultivaria festival (Saayman 2011) and the impact of the 2010 FIFA World Cup on tourism in the city (Bijkerk et al. 2012). One study looked at policing using a geographic information system (GIS) (Lochner & Zietsman 1998). There have been some studies of aspects of Paarl in relation to other small towns and small cities, such as Spocter (2013) on gated developments in the Western Cape, and Donaldson et al. (2012) and Van Niekerk et al. (2014) on the growth potential of small towns in the Western Cape. The study by Van Niekerk et al. (2014), which informed the Western Cape's provincial SDF, found that Drakenstein LM had a very high growth potential (only five of the 24 municipalities in the province were placed in this category).

3.3 Study methods

The study for this chapter used quantitative methods, supplemented by personal interviews with municipal officials, businessmen in Paarl and academics. A round-table workshop was held at the Drakenstein Municipality, which was attended by senior personnel from the departments of town and regional planning, GIS, infrastructure and the IDP office. Interviews were also conducted with two councillors and the chairperson of the planning forum. Secondary data were collected from the SDF and the property rates and taxes database. To see whether quantitative evidence supported the municipal council's argument that private developments (mostly gated and reinforcing spatial segregation) were the best method of urban renewal and development, because they made a significant contribution to the local tax base, we used the

latest property valuation data to determine the average rates and taxes for all suburbs in the Drakenstein LM. Mapping in ArcGIS showed that this was a typically middle-class city in terms of geographic extent of home ownership.

We calculated the USI for Drakenstein LM using a simple calculation that yields a Boolean result for sprawl. It shows the relationship between population increase and conversion of land to urban uses. As described by Sutton (2003), this method hypothesises that sprawl exists if the built-up area's growth rate exceeds that of the population.

The USI was calculated as follows:

$$USI_{T1T2} = CAGR_{T1T2}^{UA} - CAGR_{T1T2}^{UP} \quad [1]$$

where USI_{T1T2} is the USI for the Drakenstein LM, measured over a 15-year period, $CAGR_{T1T2}^{UA}$ is the compound annual growth rate for urban formal residential expansion, and $CAGR_{T1T2}^{UP}$ is the compound annual growth rate for urban population.

Equation 1 was obtained by calculating the compound annual growth rate as follows:

$$CAGR_{T1T2}^{UA} = [(UA_{T2} \div UA_{T1})^{1/(T2-T1)} - 1] \times 100 \quad [2]$$

and

$$CAGR_{T1T2}^{UP} = [(UP_{T2} \div UP_{T1})^{1/(T2-T1)} - 1] \times 100 \quad [3]$$

where UA_{T1} and UA_{T2} are the urban residential area for the Drakenstein LM in $T1$ and $T2$, and UP_{T1} and UP_{T2} are the urban population for the Drakenstein LM in $T1$ and $T2$.

We used the South African census data for the reference years 1996 and 2011 (a period of 15 years) to ascertain the extent of population growth. Our biggest difficulty was finding land use data over the same time period. The data we could find that were closest to the census years were for 1994 and 2009 (15 years). In calculating the urban areas for the two reference years, we used only the 'residential land use' category (formal residential land use as per land use point data on geospatial maps obtained from Geo Terra Image (Pty) Ltd), linked to cadastral boundaries, retrieved from the South African Department of Rural Development and Land Reform. By definition,

a growth rate in formal residential land development that is higher than the population growth rate would indicate urban sprawl, i.e. the USI would be more than zero. We analysed only the formal residential built-up area, since urban policy is generally to curb the expansion of formal development that results in additional land use and services costs.

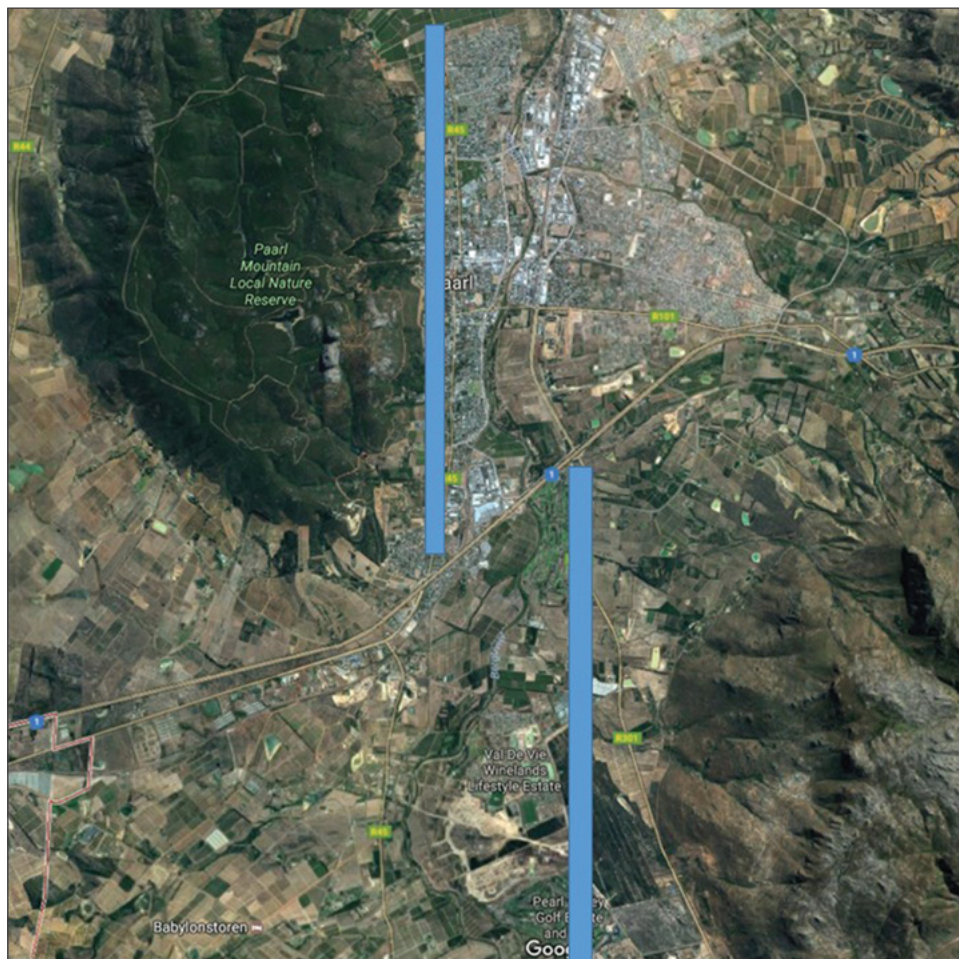
To assess the contribution of gated developments to Drakenstein LM's tax base, we conducted interviews with representatives of the Paarl Business Chamber, the Chairperson of the Planning and Economic Development Committee, and two academics who have done research on urban issues in Paarl. To get an idea of the spatial challenges this municipality faces, we discussed the SDF with personnel from the municipality's spatial planning, town planning, GIS, environment and heritage departments at a round-table workshop.

We generated property valuation maps in ArcGIS (derivative contributions to municipal tax base) using the latest property valuation data. Data cleaning entailed removing all state-owned properties from the valuation roll.

3.4 Background to Drakenstein Municipality's spatial problems

Here we look at how the political and administrative history of Paarl shaped the Drakenstein LM and gave rise to some of the difficulties it is experiencing today. The post-apartheid restructuring of municipalities was formalised in the Local Government: Municipal Structures Act of 1998. A major debate at the time was whether the 'fringe' areas – Paarl, Wellington, Franschhoek, Stellenbosch, and the Helderberg Basin (Strand, Gordon's Bay and Somerset West) – should be included in the Cape Town metropole. Proponents of a larger metropolitan area advocated a functional region, arguing that the fringe areas "were inextricably linked with the metropolitan area economically and in respect of services" – a claim that was disputed (Cameron 1999:120). The commuting figures from Paarl and Wellington to the Cape Town metropolitan area were very low at 6.9% and 4.9%, respectively (Cameron 1999). After numerous public hearings and various reports, the Demarcation Board decided to include only the Helderberg Basin. The Board

claimed that, given the large tracts of rural or agricultural land, these towns and their environs did not fulfil the criterion of being densely populated in a metropolitan sense. The Board concluded from the reports it reviewed that large tracts of mostly rural land, such as Paarl and its environs, located in the shadow of Cape Town, should not be included.



Source: Adapted from Google Maps (2017)

Note: The northern blue line shows the length of Paarl’s main central part and the southern blue line shows the length of the gated developments.

FIGURE 3.1 The extent of gated development urban sprawl to the south of the N1

Currently, Drakenstein LM covers 1 538 km². It is made up of a mix of settlement types: the secondary city of Paarl (including Mbekweni), the small town of Wellington, the Saron mission station and the two rural villages of Gouda and Hermon. The 2011 census showed that the municipality's population is dispersed across urban and agricultural areas, with almost half (45.5%) living in Paarl (Stats SA 2011). Given this municipality's agricultural setting, it is not surprising that agriculture and related industries play a major role in its economy. More than a quarter of the workers (27%) are employed in the agricultural sector, and 16% are in social services, 14% in manufacturing and 12% in trade (Drakenstein LM 2010). However, the three biggest contributors to Drakenstein's gross domestic product (GDP) per region in 2013 were the financial sector and insurance and business services (30%), manufacturing (23%), and the wholesale, retail, trade, catering and accommodation sectors (12%) (Western Cape Government Provincial Treasury 2015).

The spatial (and segregated) geography of Drakenstein LM has remained firmly in place since democracy. This geography is defined by a river (the Berg River), a national highway (N1) and a town's boundary (Wellington). To the west of the river is the former 'whites only' area, still mostly white, and consisting mostly of high-income suburbs, many cultural heritage resources, the CBD, a regional mall, the KWV wine producers, and some wine farms located within the urban area. To the east of the river is Mbekweni, the former coloured and black residential section, a mostly low- to middle-income residential area, but with pockets of middle-income residents in the coloured areas. To the south of the N1, urban sprawl is evident. Three major gated estates (Boschenmeer Golf Estate, Val de Vie Winelands Lifestyle Estate and the Pearl Valley Golf Estate and Spa) have been developed since the 1990s. Spatially separated from the rest of the urban built-up area of Paarl by the N1, these estates provide exclusive homes for the affluent. The total length of the gated estates south of the N1 is similar to that of Paarl North (see Figure 3.1). Across the Paarl town boundary lies the town of Wellington. The main urban area of the Drakenstein LM is essentially segregated into four compartments. The elongated conurbation of Paarl, Mbekweni and Wellington forms its urban core. Given its expressed

commitment to preserving its rural character and remaining outside the Cape Town metropole, the expectation is that the Drakenstein LM will guard against large-scale urban development (Drakenstein LM 2015).

Our interviews and the round-table workshop helped us to identify what the municipality needs to do if it is to solve its spatial problems, while also achieving its development and transformation goals. The four biggest problems the participants mentioned were poor public transport; political interference and lack of political will, coupled with the private sector's own agendas; infrastructure that needed repairing, upgrading or replacing; and pressure to develop vacant municipal-owned land.

The current public transport system is complicated, highly contested and leads to volatile situations between mini-bus companies. The respondents said it is vital to introduce a public bus rapid transit system, such as 'MyCiti' in Cape Town, to align the transport system with the municipality's aim of transit-oriented development. Politics was cited as a major stumbling block. Some land use decisions made by the Drakenstein municipal council contradict the municipality's SDF plans and its objective of creating a sustainable city. Councillors are easily persuaded by private developers and capital to permit developments that contravene sustainable planning principles. Infrastructure, a critical issue on the spatial transformation agenda, was described by one respondent as 'a hot potato'. Infrastructure was ageing, the municipality was not keeping pace with the need for services infrastructure in the rapidly growing informal settlements, and the existing substations were over-capacitated. The municipality is under pressure to allow new development in certain parts of the city. The two main drivers of pressure to develop vacant land are market-driven gated developments and informal housing. As expected, development applications are often subject to political interference. In Paarl South, for example, development pressure initially persuaded politicians to accede to the establishment of three large gated residential estates on greenfield land. More recently, however, politicians are coming under increased pressure to allow more mixed-use development in this area, threatening the invasion of yet more greenfield land.

Investors who are involved in the decentralised location of potential mixed-use developments come into conflict with private business owners who have an interest in preserving the dominance of the city centre. Conflicts also arise in greenfield projects where critical biodiversity and other environmental sensitivities need to be considered. The merit of a development therefore needs to be determined according to whether it is context appropriate and contributes to transformation, or merely benefits private capital.

3.5 The extent of sprawl

Table 3.1 shows that over a period of 15 years the population increase (42%) was nearly four times the increase in the formal residential area (11%).

TABLE 3.1 Drakenstein Municipality's population increase compared to formal residential area increase over 15 years

Residential area 1994	Residential area 2009	Residential area percentage growth 1994–2009	Population 1996	Population 2011	Population percentage growth 1996–2011	Population growth exceeding residential growth factor
919 ha	1 019 ha	11	177 093	251 262	42	3.85

Table 3.2 shows the compound annual growth rates for formal residential areas and the population that were used to arrive at the USI. It shows that the latter far exceeds the former, resulting in a negative USI of -1.67 . A USI greater than zero indicates the existence of sprawl. The USI of less than zero suggests that very little urban sprawl exists in Drakenstein LM. But this mathematical analysis does not take into account the different kinds of residential growth that have taken place in this municipality, which include low-density car-oriented development. It does, however, provide an indication of the disproportion between land use consumption and population growth.

TABLE 3.2 Urban sprawl index for Drakenstein Municipality

Compound annual formal residential growth rate	Compound annual population growth rate	Urban sprawl index
0.69	2.36	-1.67

The logical conclusion from these figures is that this municipality’s additional population are unlikely to have been served by the formal land development, especially since most of it was exclusive and low density. If population growth rates have spiked so dramatically in the absence of comparable formal residential expansion, and this is not because of densification of core areas, then much of the population growth must have occurred in informal settlements, which are not accounted for in our analysis. The result is two kinds of urban sprawl: in Paarl North large numbers of people are being accommodated at high densities in spreading informal settlements, and in Paarl South exclusive developments are consuming vast areas of greenfield land to accommodate only a small number of people.

3.6 Policy for spatial containment

The SACN (2015:33) considers SDFs as “the most critical lever to achieve spatial transformation” and said that if spatial transformation is “not appropriately considered and applied at this level of planning”, the transformation agenda of SPLUMA “may fail in its entirety”.

Five of the ten interrelated spatial development principles of Drakenstein LM’s 2015 SDF are directly aimed at preventing sprawl and protect rural character:

- Ensuring continuity of green networks: Ensure the continuity and connection of core biodiversity areas, river systems and landscape elements to establish connected green networks.
- Establishing well-defined and designed development open space interfaces: Ensure that the interface between green space and development is well designed so that open space is overlooked and not edged by blank edges.

- Protecting and enhancing rural character: Ensure that all interventions in rural areas are of an appropriate scale and nature to support rural livelihoods, while at the same time protecting the sense of place and the agricultural resource base.
- Enabling strategic densification: Densify residential development and cluster activities in these areas for efficient use of infrastructure and available land.
- Promoting spatial integration: Facilitate integration through well-located new development and infill, reducing barriers between communities and enabling more efficient access to facilities and opportunities (Drakenstein LM 2015:15-18)

The Drakenstein LM's SDF strongly emphasises the retention of its farmland, its rural character, its heritage and its biodiversity. It aims to maintain the urban edge and prevent urban encroachment onto peripheral land. It also makes provision for retaining and conserving some open spaces and farm areas inside the urban edge. But we found a contradiction in its approach to farmland development. Its land use management principles for Paarl farms emphasise the importance of preserving “peri-urban agricultural areas within and peripheral to the urban edge in order to protect high value and unique agricultural land, ensure on-going agriproduction and food security, protect the heritage value of the working landscape, facilitate agrarian reform and address food insecurity in urban communities” (Drakenstein LM 2015:13). But the SDF allows residential development on farmlands at Waterpoel in the Windmeul area “for future low density off-grid low impact rural lifestyle development to attract investment and increase population threshold and economic base” (Drakenstein LM 2015:107), which seems contrary to the goal of preserving a rural character and limiting urban sprawl.

The revision of the urban edge, approved by the Drakenstein council as part of the 2010 SDF, was not included in the scope of the 2015 SDF review. Only minor adjustments to align with approvals granted since 2010 were incorporated. A realignment of the edge in a rural area to the north of Paarl,

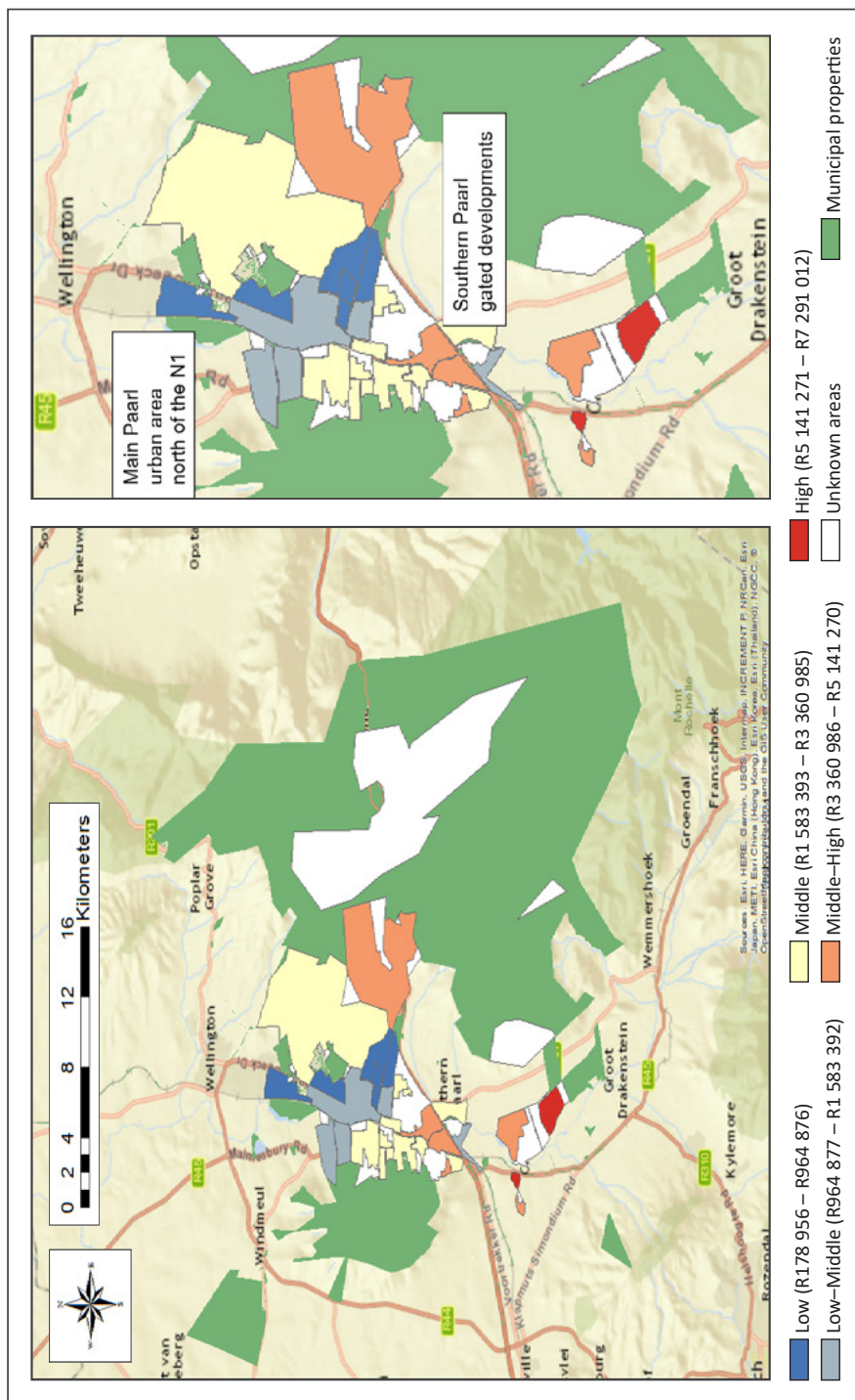
for future low-density, off-grid, low-impact rural lifestyle development to attract investment to Windmeul and increase the population and economic base, has been planned for as a medium-term project (two to eight years). This somewhat contradicts the notion of peri-urban agrarian reform to exclude smallholdings, ensuring a clear distinction between residential lifestyle units inside the urban edge and small-scale commercial agricultural units outside it. Peri-urban agrarian reform is said, among other things, to reinforce the urban edge and protect agricultural and environmental resources close to urban communities, but it should not be assumed that all land inside the urban edge is developable. As that assumption may not be a good starting point for land use decisions, the 2010 SDF recommends that land inside the urban edge should retain its rural character.

The 2015 SDF says that what limits spatial development of land inside the urban edge is “the availability of infrastructure capacity in the short to medium term”. This problem has been taken into account in the SDF’s implementation framework and may delay the development of land that has been identified as suitable for development. Ultimately, the implementation of plans for this development will depend on how the municipal budget is allocated (Drakenstein LM 2015:13).

Like almost all South African municipalities, Drakenstein LM is struggling to raise the money to clear backlogs, allow for growth and renew the existing infrastructure base. How much will be needed, will depend on whether the economy grows sufficiently to accommodate urban expansion. Adopting a more compact urban form will help to reduce the need for infrastructure spending (Drakenstein LM 2015:47). For this densification as a future growth scenario, a municipal services financial model was run for Drakenstein LM in order to “quantify the impact that different spatial decisions make on the need for capital expenditure in the municipality, the extent to which there is sufficient finance available to cover this expenditure, and the impact that the capital expenditure is likely to have on the operating budget” (Drakenstein LM 2015:45). A senior spatial planner at Drakenstein LM stated that the cost of developing, for instance, ‘gap housing’ with land prices and services is too high to be profitable for the free market.



FIGURE 3.2 Total values of taxes from five income categories compared with the area they cover



Source: Authors own

FIGURE 3.3 Average property valuations according to suburbs in Paarl

The value of attracting a high-end property market is crucial for local authorities' tax bases. Figure 3.2 shows the total taxes paid by five income categories in relation to the extent of the geographic area they cover in the city. The percentages of land in the five property valuation categories are as follows: low-valued areas (10%), low-middle (15%), middle (45%), middle-high (27%) and high (3%).

The gated developments south of the N1 and all private properties in Paarl North contribute 29% and 71%, respectively, to the local tax base. The average municipal property value in the gated developments is R1 769,83 more than the average value of private urban property in the rest of Paarl. The average value per square metre in the gated developments is R3 783, compared to R2 013. Figure 3.3 shows the distribution of the five categories. The two high category areas are the gated developments south of the N1.

Although urban sprawl remains a key policy challenge – the 2015 SDF lists six key strategies for future spatial development in municipal areas of which two are directly about sprawl – there seems to be a disconnect between how and where it is strictly contained and what the economic and ecological impacts are to the city. One of these key strategies argues for guarding against sprawling developments and the other for propagating them: “Protect the natural and agricultural resource base of the municipality as the basis of the local economy, and plan for future growth in the area to the south of the N1 in a holistic manner to ensure the establishment of an integrated settlement with a variety of opportunities, for example insuring that returns on infrastructure investment are maximised” (Drakenstein LM 2015). Although it is evident from our analysis above that gated estates contribute significantly to the city's tax base, this finding must be treated with caution and not used as an argument for building more of them. As discussed earlier, gated estates contribute to a fragmented urban form and add another kind of segregation. And in terms of environmental aesthetics and biodiversity conservation they do not support the SDF's aim of preserving the rural character of the city and its surrounds. Having determined the above, it must be noted that the case study is not solely a reflection and review of the disconnect between various priorities and other

planning strategies in the SDF. Instead, the findings open up a discussion on the challenges of how secondary cities should grow in order to be functionally viable, attract high income residential development (thus an expanded rates and taxes base), and also how to address transformation challenges in such contexts. Paarl is clearly an attractive place for the development of gated estates, but the question begs as to how city managers can innovatively plan such developments without advancing the increased disconnect from surrounding hinterland for direct city needs. Furthermore, city managers should contemplate alternative options for the current purposely designed rural lifestyles.

3.7 Conclusion

National policy is clear on spatial transformation in South Africa: the aim is to build inclusive, productive, sustainable and well-governed cities (SACN 2016:48). However, since 1994, progress in overcoming spatial injustice and socio-economic inequality has been uneven. The SACN's 2016 State of South African Cities report found that the Drakenstein SDF seems to "remain focused on managing expected land use change driven by the private sector, rather than on coordinating intergovernmental investment, spatial prioritisation and integrated spatial development strategies, or influencing the spatial investment logic of different sector strategies/line departments" (SACN 2016:52). The report elevates the critical importance in all South African urban areas of approaching spatial planning as a shared challenge, and suggests a current absence of both internal (inter-governmental) and external (private sector and other stakeholders) dialogue regarding the municipality's spatial logic and proactively guiding investment priorities (SACN 2016:52).

These inefficient spatial planning processes continue to impact the spatial pattern and character of Drakenstein LM. On the city's northern side is a sprawl of low-income informal public housing developments that accommodate the bulk of the new population growth in Drakenstein LM. This type of development is particularly detrimental to municipal and household services and efficiency. On the southern side is a sprawl of market-led developments in the form of

low-density gated housing estates, which although they bring in municipal tax income, fail to accommodate population growth, make municipal services costly, and consume large tracts of rural and environmentally sensitive greenfield land. Transformation in this municipality is slow and mostly ill-conceived, specifically with regards to innovative forward thinking regarding new housing and settlement development models. Informal settlements are not regulated by SDF planning and because of their illegal status they are not recognised as a land use category contributing to the future form of the city. Nevertheless, the rapid expansion of the informal housing sector makes it a major role player in directing the future growth of this municipality. Market-led estate development, while officially regulated by the SDF and recognised as a contributor to the urban form and economy, is subject to political interference and often succumbs to ill-informed counter-policy decision-making. Drakenstein LM has the spatial planning principles in place to guide development towards spatial restructuring but translating principles to action and management on the ground remains challenging.

It is clear that this municipality is experiencing the conflicts caused by the 'planner's triangle' described earlier (Campbell 1996), between social justice (the needs of the low-income residents), economic growth and efficiency (the gated estates and the revenue they generate) and environmental protection (preservation of rural character and farmlands). Local planners in all South African secondary cities are faced with the complexities of having to satisfy conflicting policy demands. One policy requires urban sprawl to be contained, to protect agricultural land and biodiversity; another demands that settlements be extended to provide land, housing and infrastructure for the poor. Those settlements require financing, which can be raised through property taxes from the wealthy with political influence in the gated estates. But those estates conflict with policy for protecting prime agricultural and natural resources.

These conflicts between policies demonstrate the complexity of the situation. Rather than trying to resolve them, municipalities tend to take the path of least resistance. It is difficult to take a long-range view when under pressure. Consequently, the long-term effects of development are ignored, and will no doubt create further wicked problems in the future.

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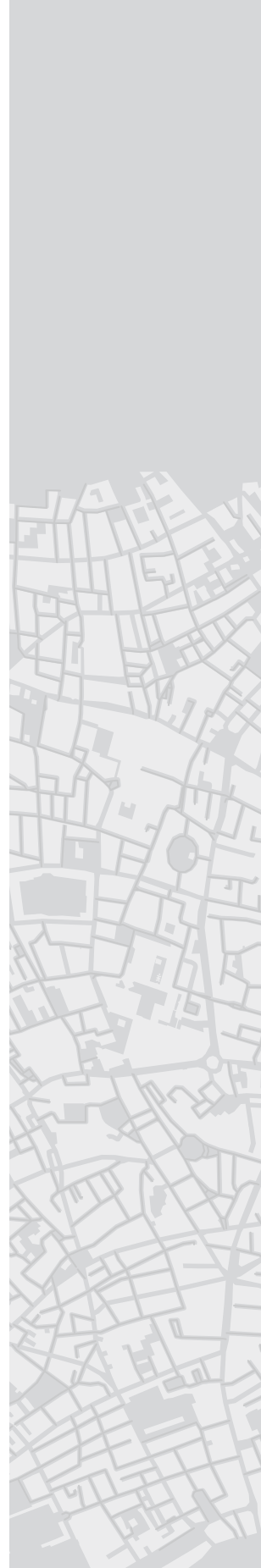
CHAPTER 4

LEPHALALE: THE ENERGY HUB OF THE LIMPOPO PROVINCE

Kgosi Mocwagae & Jan Cloete

4.1 Spatial planning for the Limpopo energy hub

South Africa is highly dependent on coal-generated energy. Consequently, some researchers refer to this dependence as the 'mineral-energy complex' (Fine & Rustomjee 1996). Within this complex, South Africa has been locked-in into coal-generated energy with major environmental problems and high water use. Eskom's decision in 2008 to construct the Medupi-power station in Lephalale further reinforced the coal lock-in. In addition to enhancing South Africa's coal dependency, this decision also resulted in the influx of people to Lephalale. The municipality had to make rapid provision for a larger middle class and for a large number of contract workers that came in search of employment.



Dealing with a transit population that had to find accommodation but would not settle permanently in the area resulted in the development of informal settlements. At the same time, the municipality had to consider the temporary nature of housing by these contract workers at Medupi. This placed extraordinary pressure on the municipal planning system of a relatively small town.

Lephalale, originally Ellisras, is a coal mining town in the Limpopo province, east of the Waterberg coalfield. Its first inhabitants were the Khoi people who settled in the area about 2000 years ago. Since the 1300s the Tswana people have occupied the area. The first colonial settlers arrived in 1808 and established farms in what is today the district of Waterberg. Initial exploration for coal started in 1941. In 1952 the coal mining company Iscor bought up six farms to expand its operations. In the early 1960s the government proclaimed the town of Ellisras, which then largely functioned as a regional services centre. In 1983 the Grootegeluk open-cast coal mine became operational and Eskom (the South African electricity public utility) built the Matimba power station. This was the first large-scale boom for the town. In 2007 Eskom began building a new power station, called Medupi (Sepedi, meaning 'rain that soaks parched lands'). The increased demand for coal for Medupi sparked a second boom, intensifying the pressure to plan for an increase in middle-income housing and bringing an influx of lower-skilled people in search of construction jobs. By 2018, many of these jobs had expired, as construction of Medupi was nearing completion.

The town was named Ellisras in 1960, after the farmers Patrick Ellis and Piet Erasmus, who had settled there in the 1930s. In 2002, the provincial government of Limpopo renamed the town Lephalale (Setswana, 'to flow'), after the municipality's main river. Lephalale LM's three main urban areas are Ellisras, Onverwacht and Marapong. The municipality also includes villages in areas managed by tribal authorities. It is the biggest municipality in the Limpopo province (13 784 km²) and forms an international border with Botswana.

Lephalale's planning situation is complex. Planning for growth and decline is difficult in the context of mining and energy generation. The boom that has pushed property prices up an unaffordable level for most people perpetuates segregation by driving the less affluent to settle in areas under traditional land management systems. Because the market leads the majority of developments, there is a worrying disconnect between the private and public sectors. Many of the mining and construction jobs are not open to local people, because the required skilled personnel are largely imported. The contract workers are unlikely to stay in the area for long. The temporary nature of labour has major planning implications. The boom of the last ten years is coming to an end, while living costs have risen. Some land developments are taking place but mining seldom helps to develop other sectors of the economy. The main difficulty lies in planning for decline.

In this chapter, we argue that mining and large-scale construction projects create pressure on land use in smaller secondary cities. It is difficult to plan for this as a large percentage of people do not want to settle permanently in the area. Effectively, the municipality was unable to plan for the disruption associated with new mining and the construction of Medupi. This chapter examines how these conflicting requirements resulted in a spatial pattern in Lephalale that contradicted post-1994 planning intentions. Finally, the case study also points to the need to develop a temporary housing approach as part of spatial planning in mining areas.

4.2 Mining booms and busts

The 'resource curse' theory, or 'paradox of plenty' states that natural resources may damage rather than benefit a country. The theory blames mineral resources for governance problems and corruption and the social ills that come with the mines. The theory is mostly applied at national level, but researchers also use it to explain the negative consequences of mining at regional and local levels. According to international literature, mining hampers the diversification of local economies, increases property prices, encourages the formation of informal settlements and displaces local populations.

South African research has claimed the same. Much of the literature explains the local consequences of mining in terms of booms and busts and uses the 'social disruption' theory to explain the social problems that come with the booms. However, research has shown that the social disruption is often not a long-term phenomenon. Longitudinal research in Australia has found that, over time, many of the disruption concerns in mining towns disappear. Ruddell (2017) noted that today's booms and busts are different from those of a decade or two ago, partly because of the effects of improved technology. Furthermore, mine closure or downscaling has also been linked to high levels of social disruption and thus should be planned for. Some notable studies of booms and busts in mining towns, and the resource curse and social disruption theories and their application in various countries are Akabzaa (2000), Brueckner et al. (2014), England and Albrecht (1984), Davies and Tilton (2005), Haslam McKenzie et al. (2009), Mwanza (2009), Ntema et al. (2017), Obeng-Odoom (2014), Smith et al. (2001), and, most relevantly, for their book, Marais, et al. (2018).

The minerals-energy complex (Fine & Rustomjee 1996) has played a big part in South Africa's development, but it has also been blamed for some of the adverse effects identified by the resource curse theory, in particular holding back economic diversification and causing environmental damage that could in the long term outweigh the benefits of mining. Some researchers, however, disagree that it inhibits diversification, emphasising, for example, the contribution of mining to South Africa's manufacturing industry (Bell & Farrell 1997; Davenport 2014).

One of the problems with resource curse studies is that researchers have applied this theory mostly at national level. However, given the need to understand the local implications of mining, researchers are increasingly applying the resource curse theory at local level (e.g. Obeng-Odoom 2014). Research on the implications of mining at local level is still underdeveloped, but there has been a substantial increase in the literature on the topic in South Africa. Louw and Marais (2018), Marais et al. (2017), and Marais, et al. (2018) discussed the complex relations between mining companies and local

planning for both mining growth and decline. This chapter builds on these papers by discussing the spatial effects of the relationship between mining, coal and energy generation in Lephalele.

4.3 Settlement planning and housing policy for mining towns

The approach to mining towns has changed considerably over the past three decades (Marais et al. 2018). Initially, the company-town model dominated policy in both the global north and the global south. Mining companies developed, managed and installed services in these towns. The resources slump of the 1980s changed this situation as profits came under pressure, although the consequences were different across countries. Mining companies reconsidered their commitment to peripheral or non-mining expenditure such as housing and sports clubs. The industry further reinforced this idea through the publication of the report *Breaking new ground* (Mining, Minerals and Sustainable Development 2002). The tendency to establish open towns or follow a policy of ‘normalisation’ is now well established. This means that mining companies have handed over the management of company towns to democratically elected institutions and the towns have both mining and non-mining residents.

The South African government and the mining companies soon adopted the principle of normalising existing mining towns and planning new mining settlements as open towns. From the early 1990s, the companies transferred their houses to their employees and the government followed with the White Paper on Mining, which emphasised integration between mining communities and other communities and the development planning advantages of open towns (RSA, Department of Minerals and Energy 1998). The White Paper stresses the importance of integrating mineworkers into the local economy, ending the racially discriminatory provisions that apply to housing, and creating an enabling environment for municipalities “to maximise the positive role the mining sector can play in promoting Local Economic Development and Integrated Development Planning” (RSA, Department of Minerals and

Energy 1998:8). Besides promoting open towns, post-apartheid policy aimed to improve mineworkers' housing conditions and change the labour regime. The compound system was dismantled, homeownership was promoted, and shift work and outsourcing (contract work) became the dominant industry practices (Marais 2018). The labour unions successfully negotiated a living-out allowance. While unions wanted parity of living-out allowances (historically only the white mineworkers were eligible for these allowances), the mining companies were looking for the best ways to ensure profitability through shift work and outsourcing.

4.4 Profile of Lephale

4.4.1 Economic trends

Lephale's economic growth rate between 1995 and 2016 was on average 2.7% per annum, with an increase to 3.7% per annum between 2001 and 2011 (Quantec 2017). Since 2011, however, it has slowed down to an average of only 1.7% between 2011 and 2015. The construction of the Medupi power station and the associated expansion of the mining industry were the main drivers of economic growth between 2001 and 2011. The rate has slowed with the completion of the construction of Medupi.

The mining share of Lephale's economy declined from 53% in 1996 to 35% in 2015, largely because of the relative increase in the electricity share (Quantec 2017). Between 1996 and 2015, two sectors increased their share of the economy by more than three percentage points: electricity from 11.8% to 14.9% and construction from 3.2% to 11.4%. The growth in the share of electricity is directly linked to the construction of Medupi, which came into operation from 2015. Together, mining and electricity contribute well over 50% to Lephale's economy. The increase in the construction share is a direct consequence of the construction of Medupi and large-scale settlement expansion and housing construction. Lephale's economy is fairly diversified, despite a decline in the share of manufacturing, from 6% in 1996 to just under 3% in 2015.

4.4.2 Demographic trends

Population growth followed economic growth as a result of the expansion of mining in the area and the construction of Medupi. Since 2001, the population of Lephalale has increased at rates of well over 3% per annum (Stats SA 2017). Between 1996 and 2016 the population increased from 78 000 to 136 000, a nearly 75% increase. Most of the growth took place during the last 15 years. The number of households more than doubled, from about 18 000 in 1996 to over 42 000 in 2016. This suggests that household size has decreased, which can be attributed to a large number of migrant workers flocking to Lephalale.

This growth has had both positive and negative consequences. The number of people in employment increased from 17 000 in 1996 to 35 000 in 2011 and the average annual household income rose sharply, from R29 000 in 2001 to R100 000 in 2011 (Stats SA 2017). The number of employed people as a percentage of Lephalale's total population also increased, from 25.9% in 2001 to 30.5% in 2011. But, offsetting this gain, the unemployment rate also increased. In 2015 it was 22%, somewhat lower than the national figure of 25%. This was 3% more than in 2011.

A negative consequence of the expansion of the mines and the construction of Medupi has been the development of informal settlements. The number of informal houses in Lephalale increased from 1 500 in 1996 to 9 500 in 2016 (Stats SA 2017). This rapid increase is the direct result of contract workers and other jobseekers flocking to the area because of the construction of Medupi and the expansion of the mines. Historically, mineworkers in Lephalale were housed in single-sex hostels in Maropong township. When the government upgraded these hostels to family housing, this meant that fewer people could live in them and informal settlements mushroomed, as they have done in many of South Africa's mining towns. Moving away from the inhumane compound system has not necessarily improved mineworkers' living conditions (Marais & Venter 2006; Pelders & Nelson 2018; Rubin & Harrison 2016). Between 2001 and 2011, the dependency ratio decreased

from 68 to 44. Analysts often see this as a positive trend, but in Lephalale it is an indication of larger numbers of migrant workers flocking to the area in search of jobs, most of whom are contract workers whose dependents live in the workers' places of origin.

4.4.3 Municipal finance

The pressures of the mining-and-energy boom and the more recent completion of construction at Medupi are reflected in the municipal finances. Between the 2007/08 and 2013/14 financial years, as a percentage of total municipal expenditure, capital expenditure declined from 25.4% to 7.4% and maintenance expenditure from 7.9% to 3.4%. Income from property tax declined from 18% to 11%, despite a substantial increase in taxable properties in Lephalale (Lephalale LM 2008, 2014).

4.4.4 Infrastructure

The mining boom put extraordinary pressure on the municipality to provide services. As mentioned above, between 1996 and 2016 the population grew by 75% and the number of households more than doubled (Stats SA 2017). This substantial increase was accompanied by an increase of 6 000 in the number of households with indoor water access, but this was still only 25% – the same percentage as in 1996. In contrast, in the same period the proportion of households with a flush toilet increased from 30% to 50% and those with electricity from 70% to 83%. These figures suggest a large scale influx into Lephalale and a municipality that tries to provide infrastructure. The low percentage of indoor water access might be an indication of little investment in housing, as many people came as migrant workers.

As also mentioned above, the number of households living in informal settlements increased from 1 500 to 9 500 between 1996 and 2016. This means that by 2016 one in five of Lephalale's 42 000 households was living in informal houses – the direct result of the influx of contract workers for

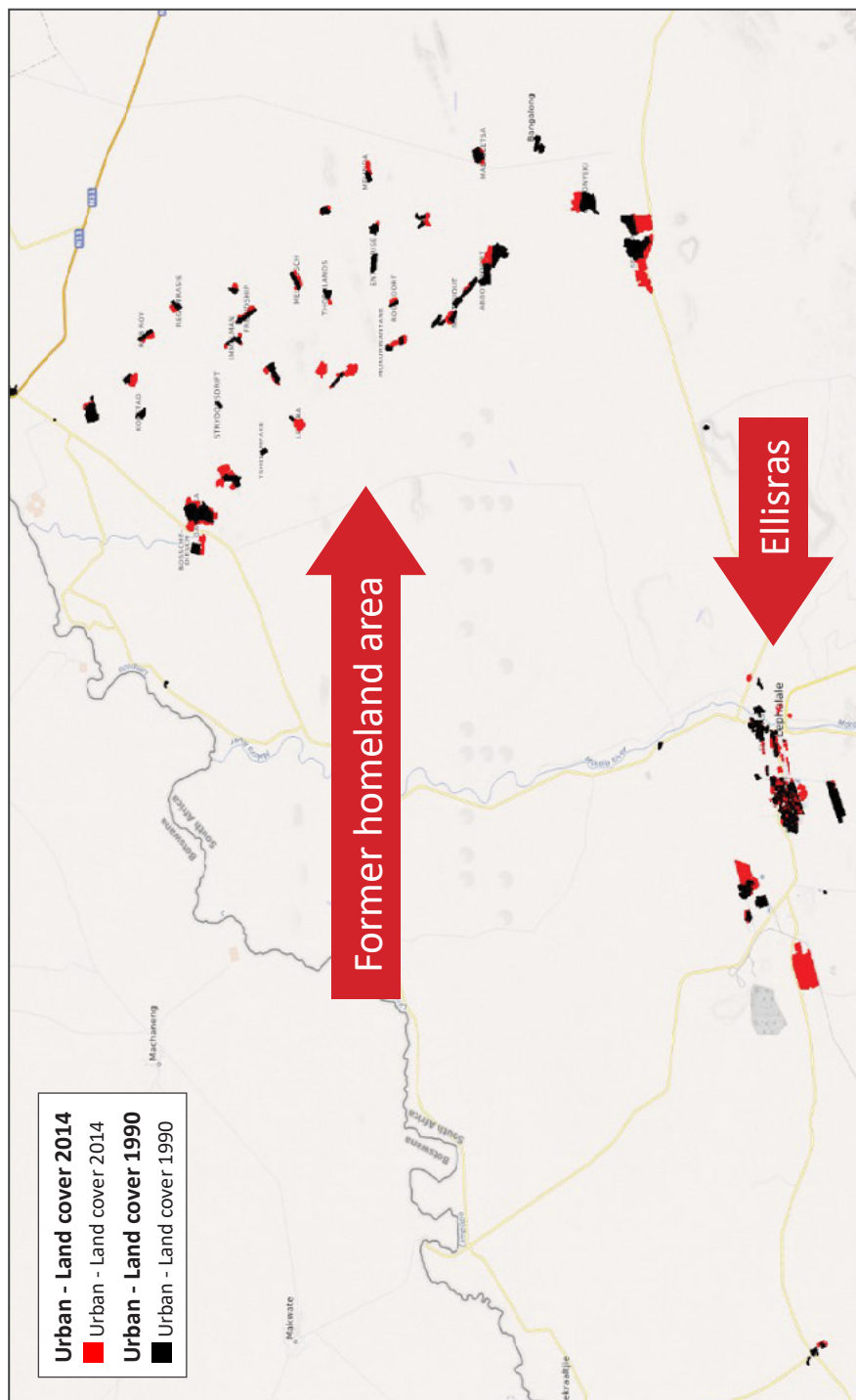
Medupi. The migrant labour associated with contract work results in people not wanting to invest in their area of work. Informal houses are a viable alternative – especially in the absence of other forms of transit housing.

Conditions like these make spatial planning difficult. In Lephalale, the municipality underestimated the spread of informal settlements and overestimated the demand for middle-income housing and thus invested heavily in infrastructure for which there was no demand. Thus planning got the demand for housing wrong, because Lephalale had a planned middle-class suburb but people did not settle there.

4.5 Spatial change and spatial planning

4.5.1 Spatial change

Lephalale LM is made up of the formal town of Ellisras, its former black township, Maropong, a large number of informal settlements, rural villages located on traditional land, and commercial farms. The rural land uses are commercial agriculture (crops, livestock and game), mining and conservation. Commercial activity in the municipality is concentrated in the CBD. The influx of people because of mining expansion and construction has made urban sprawl the norm. The area occupied by dense urban settlement or urban functions (including the mines) expanded by 62% between 1990 and 2014 (from 3 748 ha to 6 066 ha), whereas the population increased by only 47% between 1996 and 2011. Various kinds of urban sprawl are evident in Lephalale: formal land expansion to accommodate large numbers of people, informal land occupation connected to mine employment and contract workers at Medupi (including those flocking to the area in the hope of finding employment), and expansion of settlements on traditional land (see Figure 4.1).



Source: MapAble (2017)

FIGURE 4.1 Lephalale land cover, 1990 and 2014

4.5.2 Spatial planning challenges

Lephalale has three interrelated problems with spatial transformation. First, because many of the economic opportunities are for high-skilled specialists and do not favour the majority of the community, the settlement planning tends to reflect the apartheid boundaries and perpetuate economic exclusion and the inequalities of the past. Second, although many contract workers leave when their contract ends, some remain in the area, putting pressure on the municipality to provide services. Third, because the areas with affordable accommodation for low-skilled migrant workers are far from the centre (Marapong Township, the informal settlements and the traditional area 67 km from the town of Lephalale), the distances to work opportunities tend to reinforce spatial segregation along racial lines (see Figure 4.1).

4.5.3 Spatial development framework

Lephalale's SDF lists four spatial development areas (SDAs) or nodes. SDA 1 is the urban area of the municipality, which includes Ellisras, Onverwacht, Marapong and Groothoek (Lephalale LM 2015). SDA 2 consists of green fields in between the existing developments that could be developed later upon completion of environmental investigations. SDA 3 is the non-residential land use area used for mining and energy production. SDA 4 is divided into two potential development areas (PDAs). PDA 1 is the Steenbokpan node, zoned as Mining 1, the area currently being mined, and Mining 2, an area earmarked for future mining, containing some coal reserves. PDA 2 is the Stockpoort node to the west of the urban area of Lephalale, which has coal reserves that will be difficult to mine because of the surrounding commercial farms.

To address Lephalale's spatial development problems, the SDF lists the following objectives:

- To provide stable and predictable conditions for investment that is sequenced for optimal impact.

- To provide clarity to every sphere of government and every sector regarding the investment requirements to maximise the opportunities for transforming people's lives for the better.
- To create an efficient development approval process to facilitate economic development.
- To accelerate spatial transformation to reverse the undesirable settlement patterns that have emanated from past practices.

More specifically, the SDF makes provision for higher densities and states that sprawl and travel time should be reduced. Reference is made to resilience, mixed-income development and preventing the construction of housing in marginal areas (though it does not state which areas are considered as marginal). There is no reference to public transport or integrating public transport nodes. Similarly, it does not consider issues of sustainability, safety and taking jobs to high-density township areas. Other than in the CBD, planning tools such as corridor developments or urban edge policies are not used to support the SDF's objectives. In general, the municipality finds it difficult to hold its own in discussions with the mines and with Eskom. Our interviews revealed a high level of dependence on these companies.

4.5.4 Analysis of the spatial development framework

The current SDF (Lephalale LM 2015) was outsourced, as was the case with previous SDFs. Like some other South African municipalities, Lephalale lacks the capacity and skills to develop an SDF. Several problems have been evident in the development and implementation of the SDF. Municipal councillors noted in interviews the difficulty of producing a workable SDF because some plans may contradict others, as happened with the plan for the CBD. The author found little indication that all role players were included in the process of developing the SDF. The large number of unwanted higher-income residential stands, mentioned above, shows how difficult it is to plan for mining booms. And in Lephalale, the dominant role played by mining companies and power plants complicates the implementation of the SDF.

A further problem is that the SDF is not compliant with the SPLUMA and does not directly refer to the IUDF. These defects make it apparent that the SDF did take into account the spatial concerns in South Africa. However, the SDF does refer to the aims of higher densities and integration of settlements. It also acknowledges concerns about traditional land but does not propose ways of dealing with these concerns.

A further defect is that it makes no reference to climate change or the potential implications of a move towards renewable energy. While the construction of Medupi means that the town is likely to benefit from the relationship between coal and energy production, the pressure to introduce renewable energy sources could change the picture in the long term.

There is little evidence that the SDF is being implemented.

The SDF mentions four positive features of Lephalale's spatial development. First, some residential developments have made an effort to integrate the three towns of Ellisras, Onverwacht and Marapong. However, this integration has not happened across racial and economic lines. Some mining and industrial activities take place between the three towns. Second, there is sufficient electricity for the town. However, the electricity reticulation is not sufficient to support heavy industrial activity. Third, Lephalale received unqualified audits from 2013 to 2016, which indicates that if there are governance issues within the municipality they are minor. Fourth, the Lephalale Technical and Vocational Education and Training College offers technical courses for relevant work opportunities, but this resource is insufficiently used by companies.

Six problems require attention. The first is that while mining is broadening the development of middle-income market housing by increasing the migrant middle class, there is not enough water for this initiative and land infill has not been addressed adequately. The second is the population increase in the township of Marapong. The third is that the SDF fails to adequately address the issues faced by the municipality. Fourth, the implementation of the CBD plan went awry because the consultants did not understand the nature of the mining rights in the area. Fifth, the land earmarked by the SDF for the GAP

housing market, but notices referring to an environmental impact assessment for the establishment of the Groothoek mine (an open-cast mine owned by Umbono Coal) indicate that this land might be destined for other uses.³ The sixth problem is that there has been pressure on the traditional area to absorb low-earning workers from the mine and Eskom because they cannot afford to pay rent in the towns.

4.6 Spatial transformation and complexity

The case study of Lephalale brought to light five complexities in planning and spatial transformation.

First, there is a contradiction between government policy for mining settlements and the reality on the ground. The good intentions of the government and the unions resulted in urban sprawl, as also happened in Rustenburg. Dismantling the inhumane compound system in favour of single living quarters was directly responsible for the development of informal settlements. Living-out allowances for black workers negotiated by unions had the same result. A greater emphasis on contract workers moreover reduced permanence and increased informal settlements. Shift work made travelling easier and helped to maintain a degree of migrant labour. This, in turn, made mineworkers more mobile and reinforced migrant labour and informal settlements. Doing away with the compounds turned out to be the main contributor to informal settlement development. Informal settlements have effectively replaced the compound. Government decisions, company policies and people's responses are largely complex adaptive systems that we still do not adequately understand.

Second, the uncertainty that accompanies mining growth makes planning difficult. Apart from considerable in-migration at the lower end of the market, middle-income households also migrate. The planners in Lephalale

3 'GAP' refers to the shortfall, or 'gap' in the market between state housing and private housing. The gap housing market consists of people with a monthly income of between R3 500 and R15 000 a month – too low to participate in the private property market but too high to qualify for state assistance.

overestimated this demand and serviced too many stands. The over-planning and infrastructure provision of residential stands often occur in secondary cities. Such grandiose planning is often a way to illustrate growth. This is a notable example of planning in the dark. Effectively, the question is: How should we plan at a local level when the future is uncertain? There is enough evidence in South Africa to show that mine downscaling is detrimental to the development of urban areas (see Chapter 6) (Marais, 2013a; 2013b),

Third, informal settlements do not only develop in and near the mines and energy plants but also on traditional land. This adds to the complexity of managing urban growth. Making sure that effective services are delivered to all will be difficult on customary land.

Fourth, Lephalale has increased its dependence on coal and energy over the past decade. In addition, despite being likely to provide energy for two to four decades, Medupi has locked Lephalale even more tightly into the minerals-energy complex. The overall benefits for the town are not clear and the fact that the municipality has struggled to provide the required services or miscalculated possible development suggests how difficult it is to ensure that mining towns benefit from their surrounding mining economies. Increasingly, national and global pressure will result in an emphasis on sources of renewable energy. While Lephalale and Medupi are safe in the medium term, the question is how these changes will affect the city 20 to 30 years from now.

Fifth, mining and energy companies are starting to play a dominant role in the management of the town. The Lephalale Development Forum, a form of hybrid local government made up of the Lephalale LM, Eskom and Exxaro (a large coal and heavy minerals mining company), has taken over some of the functions of the municipality and is assisting communities. However, it is important to bear in mind that this is largely the result of the municipality's inability to provide adequate services and planning. Although the companies help to manage municipal services, they do not have the same commitment to spatial transformation's policy principles and at the same time create problems through the migration of people into the town.

4.7 Conclusion

The Lephalale case study offers a typical example of the implications of a mining or industry boom for a relatively small secondary city. It also shows how difficult it is to plan strategically or spatially amid the increasing uncertainty related to mining. Continued volatility means that local planning is bound to get it wrong. Lephalale has seen thousands of people streaming to the city. However, these migrants do not want to live in Lephalale. They only want to work there. Government policies and company behaviour have affected the nature of settlement. Informal settlements were the direct result of the interplay between government policies, the unintended consequences of company policies, and people as decision makers on the ground. The reality of contract and mine work requires innovative responses that will ensure higher densities, limit sprawl and help deal with the boom and bust cycles. Government and municipalities should consider some form of institutionalised rental housing.

The result has been a substantial increase in informal settlement development and urban sprawl to provide space for higher-income households. Land expansion has been massive, and the city has largely been unable to plan for it. In the longer run, the economy of Lephalale will be heavily dependent on South Africa's chosen energy mix. Increased use of renewable energy is likely to have local consequences for Lephalale – as will any efforts associated with nuclear energy.

From a planning perspective, it is crucial for Lephalale to deal with the power of the large mining and energy companies in such a way as to satisfy the planning demands of all concerned. Yet it is apparent that increasingly, these large companies will drive the planning, because of the lack of local capacity. These companies will then be both the main contributor of influx as well as helping to deal with the problem. Although this might have short-term benefits, there is very little evidence that the notion of spatial transformation will be given adequate recognition. And, additional problems arise when these companies close down.

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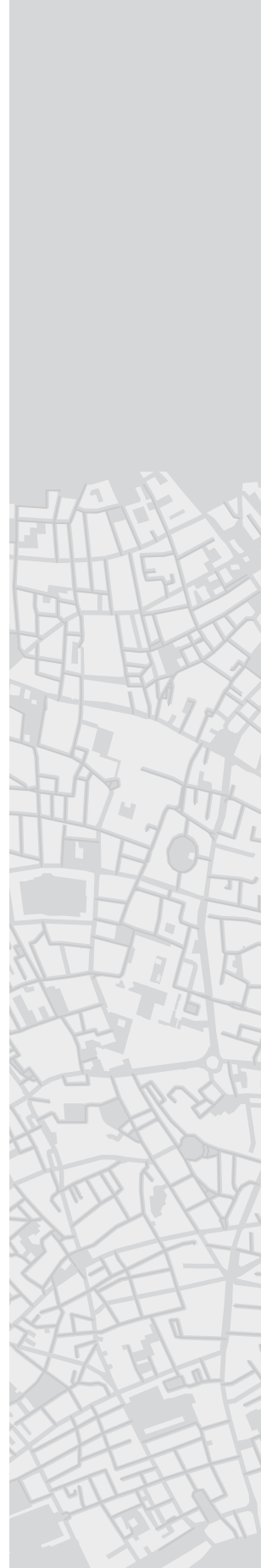
CHAPTER 5

MAHIKENG: A REMOTE PROVINCIAL CAPITAL WITH A TURBULENT HISTORY

Verna Nel & James Drummond

5.1 Introduction

Mahikeng's development problems today are largely the result of its history and its location at a border between countries. The city has served as the capital of three territories (the Bechuanaland Protectorate, the Bantustan of Bophuthatswana, and finally the North West Province of South Africa) where successive governments have pursued diverse goals. Each regime has grafted its neighbourhoods onto the original settlement, forming patterns that continue to influence its spatial and socio-economic trajectory.



Mahikeng lies 36 km south of the border between South Africa and Botswana in an area long settled by Batswana clans. British colonial ambitions, fuelled by the discovery of diamonds and gold, meant that the road to the north had to be secured. To this end, the town of Mafeking was established adjacent to the existing settlement established by the Molema clan of the Barolong (Parnell 1986). The well-known Siege of Mafeking by Boer forces during the South African War was documented by Sol Plaatje, a court interpreter, journalist and leader of the early African National Congress (Starfield 2012). Mafeking remained the capital of Bechuanaland, even though the town was part of the Republic of South Africa from 1961, until 1965 when Bechuanaland gained political independence was renamed Botswana and moved its capital to the new city of Gaborone (Drummond & Manson 1991).

Once the administration of Bechuanaland was transferred to Botswana, Mafeking lost much of its economic base and its woes were compounded by the enforcement of apartheid segregation (which had not been applied previously). Not even the identification of the city as a 'border town' under apartheid national planning policy helped to stimulate development (Oranje & Merrifield 2010).

However, the formation of the Bophuthatswana Bantustan in 1977, with its new capital Mmabatho, six kilometres north of Mafeking, led to an economic boom. The business community of Mafeking campaigned for the town to be incorporated into the Bantustan and, with the supporting vote of white residents, this was done in 1980 and the city was renamed Mafikeng. For the Bophuthatswana government, Mmabatho-Mafikeng was an opportunity to celebrate Tswana culture in a modern city (Jones 2000).

Despite deep concerns about the future of Mafikeng after the re-incorporation of the Bantustans into South Africa in 1994, the city was demarcated as the capital of the new North West Province (Jones 1999). It also became the capital of the Ngaka Modiri Molema District Municipality in 2000. Two years later, Mafikeng was renamed Mahikeng ('place of stones') to reflect the local

pronunciation of the name more closely. However, the name Mafikeng is still in common use as in the name of the Game Reserve, as well as by local residents to refer to the town.

The unique history of Mahikeng has been fruitful terrain for researchers (for example Parnell 1986; Drummond & Manson 1991; Drummond & Parnell 1991; Jones 1999, 2000; Drummond et al. 2017). Some studies have been done of the economic and spatial development and the governance of the city: Mosiane (2000) considers local economic development, Kleynhans et al. (2003) discuss the platinum spatial development initiative, Bogopane (2012) and Mabua (2016) evaluate the governance capacity of the local and district municipalities respectively, and Selemela and Du Plessis (2016) compare development in traditional and non-traditional areas of the municipality.

5.2 Study method

We interviewed government officials, businesses and traditional leaders in the community. Although we did not receive the Municipal Manager's permission to interview municipal officials while conducting field work, we did receive a written response to some of our questions. Interviews with the traditional leaders also had to be arranged through the municipality. Despite numerous emails and phone calls we were unable to secure those interviews. Attempts to secure interviews with the North West Business Forum and AgriNW were equally unsuccessful.

It must be noted that allegations of corruption and state capture were emerging when we conducted our field work as well as contestations around the African National Congress's elective conference (held in December 2017). Furthermore, protests accompanied by violence directed at the Premier of the North West Province erupted early in 2018. These underlying tensions probably contributed to the unwillingness to engage with researchers.

We did, however, interview the planning consultancy, which was responsible for the municipal spatial development framework (SDF) and they complemented the interview with a written response to key questions.

We held discussions with officials from the Department of Rural Development and Land Reform (DRDLR) and the Registrar of Deeds for the North West Province. To complement our primary data, we used secondary information from academic journals and books, newspaper articles and websites, and data from Statistics South Africa and Quantec Research (Pty) Ltd. Maps were sourced through MapAble (Pty) Ltd.

5.3 Complexity of planning in Mahikeng

In Mahikeng, history and tradition, governance and spatial form are tightly interwoven and cannot be easily separated. The tensions between old and new forms of governance, ideal spatial forms and economic development philosophies are responsible for much of the complexity that simultaneously promotes and stifles development in Mahikeng.

All human settlements are complex social-ecological systems (see Chapter 2, this volume) and Mahikeng is no exception. These systems consist of natural, economic, social, political and governance systems, including their subsystems, that interact and influence each other. One dominant social system in Mahikeng is built on tribal customs and the preservation of traditional culture and values, embedded in pastoralist lifestyles. This system is evident in the low density settlement patterns of the tribal areas beyond the central urban area and in the authority the traditional leadership wields over the allocation and use of land. Although traditional leadership can be progressive (Starfield 2012) it often wants to preserve the past and the power associated with it (Beall 2006), a conservative tendency that runs counter to neoliberal and democratic notions espoused by governments. This can cause discord between planners whose viewpoints, influenced by these conflicting belief systems, favour modern rational planning systems. This path dependency, which systems analysts call 'hysteresis', can be seen in urban spaces that reflect variously the legacy of a previous dispensation (in this case apartheid) and new and fashionable planning philosophies.

A further complication is that the three spheres of government operate in the same space. Although they may (notionally) be working towards the same goals, with their policy and programmes made consistent through the municipality's integrated development plan (IDP), cooperation between them is often impaired by conflicting priorities and arguments over allocation of resources or responsibilities (Beall 2006; Dubezane & Nel 2016; Williams et al 2016). To add to the complications, Mahikeng has an additional sphere of governance in the form of the traditional authorities who control much of its land. This has significant implications for implementing plans. The various spheres of government constitute a series of overlapping interacting systems where their plans and activities operate at different spatial and temporal scales and cycles (see Chapter 2, this volume, and Holling 2001). In the social-ecological system that is Mahikeng, tensions arise from mismatches between the various scales and cycles. For example, municipalities in South Africa work in five-year cycles (councillors serve for five years and IDPs are plans for five years), but traditional leaders work on different time scales, such as the life-span of the *kgosi* (chief) (CLS 2013), and spatially their areas of jurisdiction do not necessarily coincide with those of the municipal or provincial government (National Planning Commission 2012).

Many of these tensions are evident in Mahikeng. While the councillors are ostensibly responsible for determining development patterns throughout the entire municipality, effectively the spatial form is determined by the traditional authority independently of any SDF or government policy. It appears that development is being shaped by ad hoc decisions on land allocation that ignore the implications for bulk infrastructure (such as water). A short-term demand for unencumbered or inexpensive land overrides long-term concerns for environmental sustainability or the economic viability of the municipality.

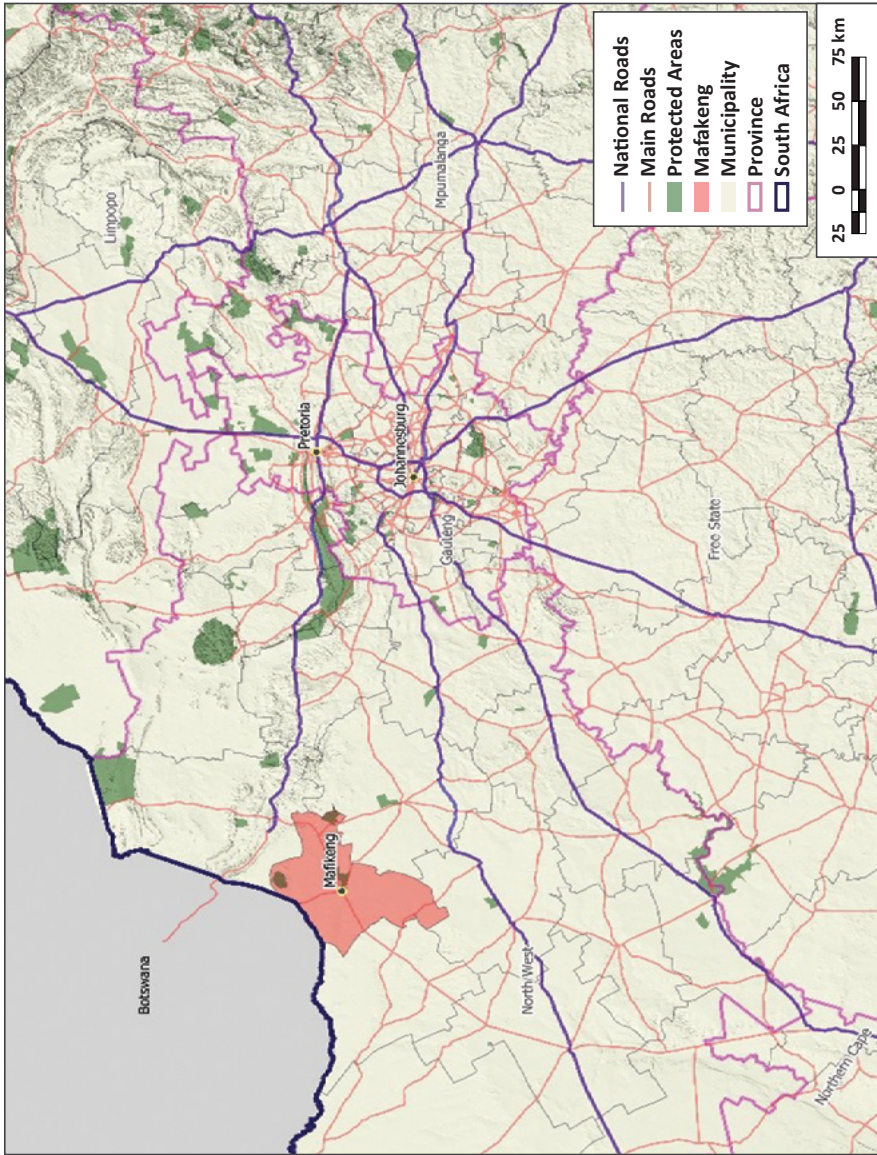
5.4 Planning in a difficult space

The city of Mahikeng lies roughly in the centre of a rural municipality which is all traditional tribal land except for the south eastern quadrant. The urban core contains the original CBD and the industrial area immediately north

of it, following the same street grid as the CBD. The Mmabatho government precinct lies north-west of the industrial area with the North-West University campus to the north of that. Formal serviced residential areas abut the CBD and industrial areas to the east and west and also to the east of the North-West University campus. The Mafikeng Game Reserve extends eastwards from the Molopo river (see Figure 5.2 a & b).

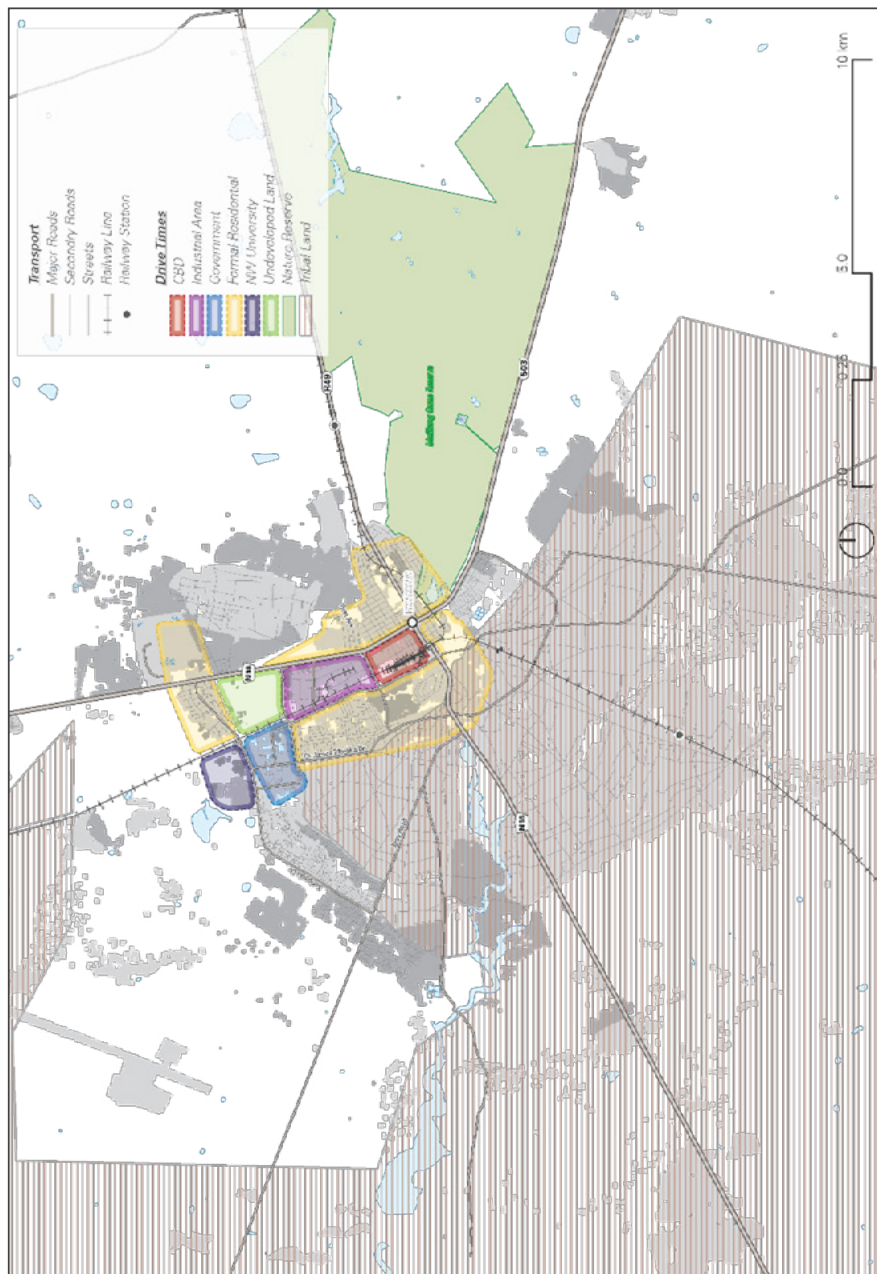
Informally developed tribal areas surround most of the town and comprise 75% of the municipality, with urban settlements making up about 22% and agricultural land the remainder. The urban density is low (0.8 persons per hectare) and decreases with distance from the city (Stats SA n.d.). However, there are several higher density settlement clusters, particularly to the south east, that are taken into account in the SDF for the Mahikeng Local Municipality (referred to in the rest of this chapter simply as Mahikeng Municipality). The low density of the rural area makes it difficult for the municipality to provide basic services, particularly water services. And since only formal, registered properties with piped water can be billed, Mahikeng Municipality does not receive income from property tax or services from the very large portion of the municipality that is under tribal authority. Mahikeng Municipality's financial sustainability is thus severely constrained by its spatial form and governance structure. A further problem is that the municipality appears to exercise little authority within tribal areas.

Substantial growth occurred in the urban core after 2004. New offices, hotel and additional residential areas were constructed and a municipal airport that had been a buffer zone between Mafikeng and Mmabatho was redeveloped for retail purposes. Much of this development occurred as infill, overcoming former spatial divides and integrating the city. Few large developable spaces remain, with the exception of an area opposite Mmabatho that is subject to controversy. Formal Mahikeng finds itself in an enclave, surrounded by tribal authority land, with little undeveloped land available where it can implement revenue generating development (personal communication, Mahikeng Municipality planner, 31 May 2015).



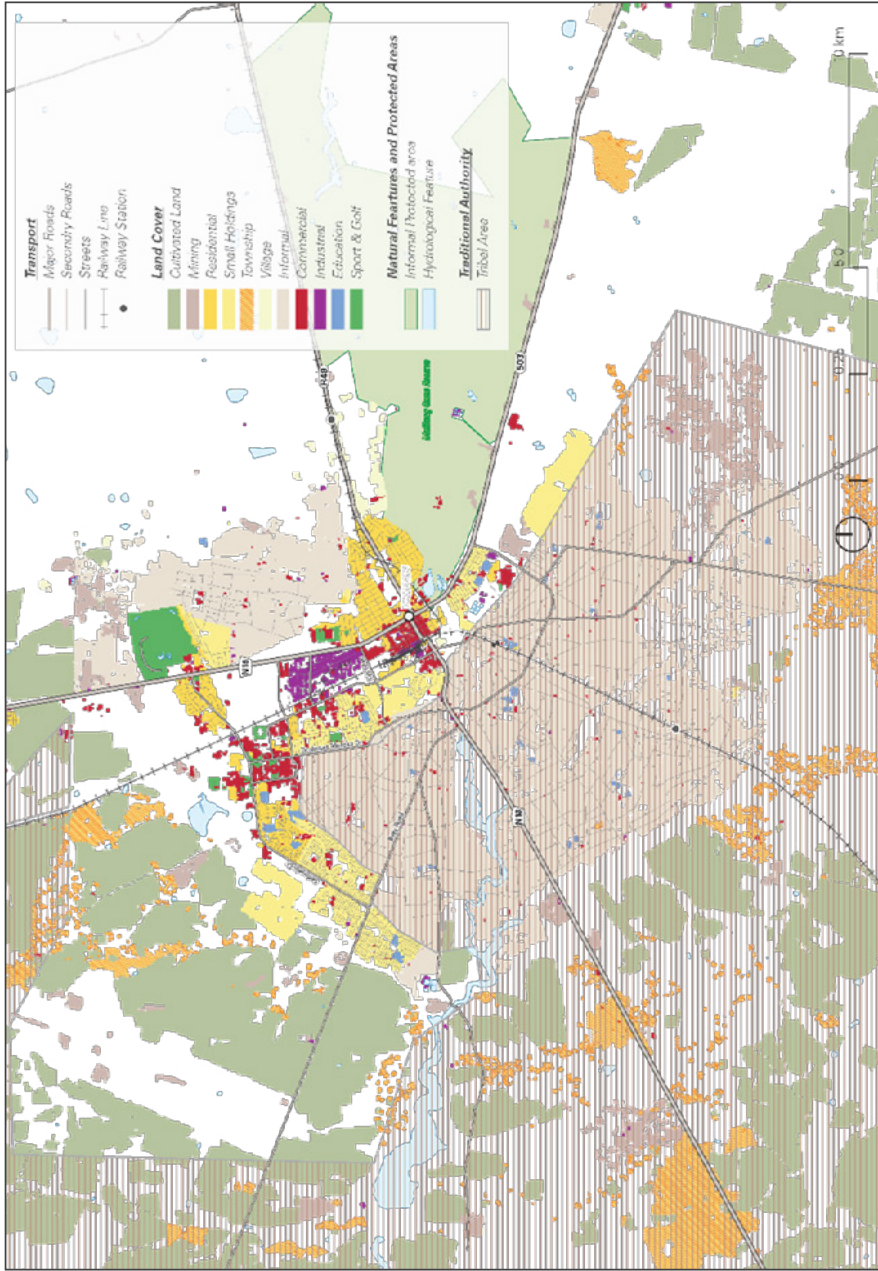
Source: Google Maps (2018)

FIGURE 5.1 Location of Mahikeng in South Africa



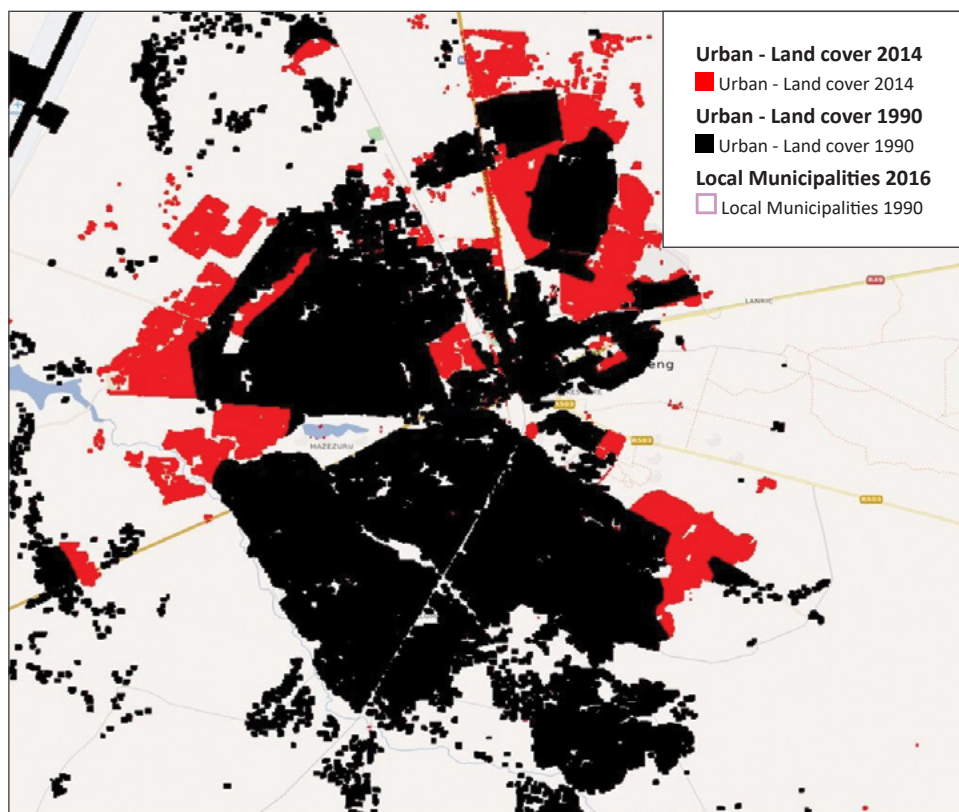
Source: Adapted from Google Maps

FIGURE 5.2 A: Broad land uses in Mahikeng



Source: Adapted from Google Maps

FIGURE 5.2 B: Broad land uses in Mahikeng



Source: Author, based on SANBI data (2014)

FIGURE 5.3 Mahikeng settlement growth, 1889–2014



Source: J Drummond (author) (2017)

FIGURE 5.4 Large houses and properties on Mahikeng tribal land

Growth in the peripheral areas has not been hampered by a lack of land (see Figure 5.3). Most new development has taken place to the north, between five and ten kilometres from the urban centre. Some of this expansion was due to the invasion of the municipal commonage, where state-subsidised houses have since been built. Other developments include the construction of large houses on tribal land, with sites over 1500m² in the north eastern periphery of the town (an example is shown in Figure 5.4).

5.5 Policy and planning frameworks

Besides national policy such as the NDP and the IUDF, the Mahikeng LM is also subject to provincial plans and sector plans of national and provincial government. Key provincial plans are the Provincial Development Plan (NWP DP) (North West Planning Commission 2013) and the NWP SDF (2017).

The 2013 NWP DP closely follows the NDP with respect to its priorities and proposals. According to its analysis of the provincial economy, mining was the dominant economic activity (over 35% of gross value added [GVA] and 21% of employment). Government and community services were the top employers (23%), followed by trade (19%). These service sectors, along with finance, contributed 60% of GVA to the economy. Strategies for stimulating development include assisting small and medium enterprise development, promoting labour absorbing industries, improving competitiveness and developing rural areas. Developing economic infrastructure, addressing the poor state of provincial roads, and providing water and electricity are proposed in the plan. In order to address inefficiencies, and provide accessibility to larger urban settlements, three provincial development corridors are proposed, one from Gauteng to Botswana along the N4, another from Zeerust to Mahikeng and then southwards along the N18 to the iron ore mining region of the Northern Cape province, and a third running south-west along the N12. Mahikeng is a Priority One node in the plan, along with other cities in the province.

These corridors, as well as one along the N12 from Tshwane, are included as a key strategy in the NWP SDF, along with spatial development initiatives and development nodes and zones. Mahikeng is a primary node and the starting point of a corridor running south-eastwards through Lichtenburg, Ventersdorp and Potchefstroom. Other strategies seek to protect biodiversity, water and agricultural resources, increase infrastructure investment, promote economic development and job creation to change the spatial pattern, and balance urbanisation and the development of rural areas.

Both the NWP DP and the NWP SDF stress the need for spatial transformation of settlement patterns to reduce inequality, improve access to social services and infrastructure and ensure greater sustainability. The NWP DP takes its cue from the NDP with similar proposals for the restructuring of settlements, improving state capacity and encouraging community participation. The spatial transformation themes are expanded in Mahikeng's municipal SDF and applied to both the wider municipal and urban areas.

5.6 Profile of Mahikeng

5.6.1 Demographics

The expansion of the settlements around the urban core is a physical manifestation of population growth and 'peri-urbanisation'. Mahikeng's population increased from 242,146 in 1996 to 314,400 in 2016, with 71.3% of the population aged 15 to 64 in 2016, a 9% increase since 2011. The total number of households increased by 22% from 84,239 in 2011 to 103,333 in 2016, while household sizes are falling (Municipalities of South Africa 2018). Table 5.1 shows details of the demographic profile. The rural population on tribal land is growing faster than the urban population (Stats SA 2012, 2016a), which could be because of shortage of land in the urban core and the lower costs of living on tribal land (Mahikeng Municipality 2016a).

The majority of the residents of Mahikeng are black (95.5%), with coloureds, Asians and whites comprising 2.3%, 0.8% and 1.3%, respectively. Setswana is the dominant language (77%), followed by English (4.5%) with isiXhosa,

Sesotho and Afrikaans speakers each comprising only a small percentage of the population (Stats SA, 2012). Mahikeng is remarkably integrated. The only areas that retain a vestige of group areas planning are the former coloured and Indian areas, but these are now multiracial. Although there is some class segregation in the formal areas, it appears to be largely absent from the informally developed areas where houses of over 300 m² are cheek by jowl with others of less than 60 m².

TABLE 5.1 Mahikeng's population

Indicator	1996	2001	2011	2016
Total number of people	242 146	259 478	291 527	314 394
Total number of urban people	n/a	n/a	64 623	54 257
Percentage of urban people	n/a	n/a	22.2	17.2
Total number of rural people	n/a	n/a	226 904	260 137
Percentage of rural people	n/a	n/a	77.8	82.7
Number of rural people (traditional)	n/a	n/a	218 474	256 133
Percentage of rural people (traditional)	n/a	n/a	74.9	81.5
Number of rural people (commercial farms)	n/a	n/a	8 430	4 004
Percentage of rural people (commercial farms)	n/a	n/a	2.9	1.3
Total number of households	51 484	64 673	84 239	103 333
Average annual population growth since previous period (%)	n/a	1.4	1.2	1.5
Average annual household growth since previous period (%)	n/a	4.7	2.7	4.2

Source: Stats SA (2002, 2012, 2016a, 2016b)

The education level of the population has increased since 2011 (see Table 5.2) but remains lower than the South African average, except in the case of higher education. Of the population over 20 years of age, 12% had higher education while the national average was 3.3% (Stats SA 2016b). This could be attributed to the demands of the provincial government for

professionals. Only 29% had completed their secondary education and 50% had only some schooling (Municipalities of South Africa 2018). These low education levels have no doubt affected the employability of the community.

In 2011 only 20.5% of Mahikeng’s population were employed (Stats SA 2012). The official unemployment rate was 35.7% (47.1% for youth) in 2016 (Municipalities of South Africa 2018) but the actual rate is probably far higher. According to Mahikeng Municipality’s SDF, between 13% and 15% of the economically active population were employed in the informal economy. Between 2001 and 2011 the percentage of people in semi-skilled and unskilled labour decreased, with a concomitant rise in the percentage in skilled employment (Maxim Planning Solutions 2014).

TABLE 5.2 Educational level of population 20 years and older

Educational level	2011	2016	South Africa community survey, 2016
No schooling	10.3%	7.1%	6.0%
Some education	51.3%	50.7%	59.36%
Completed secondary (matric)	26.0%	29.8%	31.41%
Higher education	12.4%	10.9%	3.26%
Total	100%	100%	100%

Source: Municipalities of South Africa (2018); Stats SA (2016b)

5.6.2 The economy

Mahikeng Municipality’s GVA has grown slowly, by only 0.7% over the past six years (Maxim Planning Solutions 2014). Its financial contribution to the national GVA was similar to that of other secondary cities, with the exception of Rustenburg, which far outperforms the other cities (Turok & Borel-Saladin 2013:17). As Table 5.3 shows, the government services sector is the main employer and second largest contributor to GVA, which is not surprising as Mahikeng Municipality is the seat of the provincial, district and municipal government. Although the percentage of employment in this sector has dropped from 44% to 35.4% from 1996 to 2011, it nevertheless contributed

over a third of formal employment in the municipality. Business services have grown substantially to match the government sector in terms of GVA yet have created less employment. Employment in the trade and business services sectors was 17.5% and 16% of all employment respectively in 2011. Manufacturing contributes relatively little to the economy, but employment in this sector has grown since 1996 while the contribution to GVA has decreased. The primary sectors have shrunk in respect of GVA, but mining has shown a threefold increase in employment since 2001 (although from a low base). Examples of mining activity are the large limestone quarries and a cement factory to the east of the urban area near Buhrmansdrift and Slurry Village, and Kalgold, an open cast gold mine near Kraaipan in the south. While visiting Mahikeng in 2017, we saw a great deal of construction work on land occupied informally on the periphery of the urban core. We surmise that much of this construction is being done through the informal economy and is therefore not captured in formal accounts.

TABLE 5.3 Percentage contribution to the economy per sector: Employment and gross value added

Sector	Employment			Gross value added			
	1996	2001	2011	1996	2001	2011	2015
Agriculture	5.1	6.6	3.2	2.1	1.4	1.3	1.2
Mining	0.7	0.9	2.7	0.4	0.7	0.4	0.2
Manufacturing	5.8	5.3	6.5	4.0	4.1	3.7	3.4
Utilities	0.3	0.4	0.4	5.5	4.0	4.1	3.5
Construction	4.2	4.2	3.9	2.8	2.7	3.2	3.4
Trade	11.2	13.8	17.5	14.1	14.0	12.2	11.9
Transport	3.8	3.8	1.9	6.5	7.8	8.3	7.7
Business services	8.3	11.9	16	19.5	20.9	27.5	29.8
Government	44.5	37.5	35.4	33.8	31.5	28.1	28.4
Community	16.2	15.8	12.3	11.3	12.8	11.1	10.4

Source: Maxim Planning Solutions (2014:24); Quantec (2017)

5.6.3 Service provision

The urban core of Mahikeng enjoys full services (piped water, flush toilets and electricity), but the remaining areas depend mostly on standpipes (41.6%) or boreholes for water (25%) and septic tanks, French drains or pit latrines for sanitation (Mahikeng Municipality 2016a). Only 23% of households have piped water inside the house and only 32% have flush toilets. Over 90% have electricity. The municipality says that to promote growth and become more competitive the city needs to clear the backlog of repairs and additions to bulk engineering services (Personal response from Municipality).

TABLE 5.4 Mahikeng household indicators

Indicators	1996	2001	2011	2016
Total number of households	51 484	64 673	84 239	103 333
Number of households with indoor water	16 592	15 220	25,990	23,907
Percentage of households with indoor water	32.2	23.5	30.9	23.1
Number of households with flush toilets	13 048	19 634	27 642	32 913
Percentage of households with flush toilets	25.3	30.4	32.8	31.9
Number of households with electricity	20 953	46 550	71 216	95 561
Percentage of households with electricity	40.7	72.0	84.5	92.5
Number of households in informal structures	3 416	5 667	8 760	9 969
Percentage of households in informal structures	6.6	8.8	10.4	9.6
Value of building plans submitted (ZAR)	10 051 100	19 804 000	187 315 000	130 436 000

Source: Stats SA (2002, 2011, 2015)

The Municipalities of South Africa (2018) states that almost 60% of Mahikeng's population in the urban area are provided with weekly refuse removal, but the extent of dumping and litter strewn in public spaces indicates that the waste manage service is not coping. According to the 2016/2017 Mahikeng IDP, the garbage collection trucks frequently break down because of "overuse and poor maintenance" (Mahikeng LM 2016a:26).

The municipality has about 275 km of roads. Those in the urban area are in poor condition and the 100 km of rural roads require constant maintenance or upgrading, as well as improved stormwater drainage (Mahikeng LM 2016a).

5.6.4 Governance

The history of the city and the legacy of Lucas Mangope, formerly head of the Bophuthatswana homeland government (Lawrence and Manson 1994), have led, according to Matheolane (2013), to "the systematic sabotage of a once thriving town". This can be a reason for the less than ideal relationship between the municipality and the provincial government.

Ncube and Vacu (2014) note several indicators of a municipality in distress, such as poor audit outcomes, financial problems, deferred maintenance, management problems and absence of long-range plans. These are all applicable to Mahikeng, along with many other municipalities in South Africa (The Presidency 2014).

Mahikeng's audit outcomes have been poor over the past four years and its cash balance was negative at the end of the 2016/2017 financial year as it had overspent its operating budget and had been running at a loss in the previous three financial years (Municipalities of South Africa 2018). Over 33% of the operating budget was classified as unauthorised, irregular, fruitless and wasteful expenditure – over three times the national average for similar municipalities. Expenditure on repairs and maintenance was under 2% in 2014 to 2016 and nil in 2017 while the ideal should be about 8% (National Treasury 2018).

The most recent audit report (for the 2015/2016 financial year) is critical of the municipality's poor leadership, lack of appropriate policies and inefficient procedures for financial and performance management. It also lacks the skills and capacity required for service delivery. According to the 2017/18 IDP, five of the seven top management posts were vacant (Mahikeng Municipality 2016b). The vacancies page of the municipal website (dated October 2017) carried advertisements for three top management posts. Only 14% of all positions were vacant in 2016, an improvement of the situation in 2006/2007 where only 30% of the posts were filled (Bogopane 2012). The available Mahikeng IDP documents lack the strategic planning components that could direct long-range development. The 2017/18 IDP appears to be an incomplete draft similar to the document that was available as the 2016–2021 draft IDP on the municipal website in 2017 (Mahikeng Municipality 2016b). None of the IDP documents make reference to an SDF although this is a legal requirement for IDPs to reflect an SDP within the document.

The planning department appears to focus on land use management. Although it does undertake spatial planning, it was not geared to implement the requirements of the Spatial Planning and Land Use Management Act (RSA 2013) at the time of this study. In May 2017, nearly two years after SPLUMA came into effect, Mahikeng Municipality had not been able to institute a municipal planning tribunal or enact by-laws to guide land development applications (presentation by Ms Kgosiemang, official from the Department of Rural Development and Land Reform, 30 May 2017, Klerksdorp).

5.6.5 Planning for spatial transformation

Mahikeng Municipality's SDF contains a thorough analysis of the bio-physical and socio-economic status of the municipality. Its aim is to solve the municipality's spatial problems, such as the dispersed settlements that characterise 75% of the municipal area. The current spatial form – dispersed low density settlements, inefficient and expensive service provision, homogeneity and the unsustainable use of ecosystem services – does not match the sustainable urban settlement envisaged by South African policy, namely a compact structure supporting public transport with diverse land

uses, housing types, and urban amenities and a limited ecological footprint. The SDF also tries to balance the need for economic development to counter unemployment and poverty with the need to improve the provision of water, sanitation and social services while strengthening urban-rural links. To achieve these aims, the SDF plans to increase the density of activities in rural areas by creating corridors to link the densest clusters of villages as development nodes (Figure 5.4). Maxim Planning Solutions (2017:np) says that in line with “the NSDP [National Spatial Development Perspective and provincial SDF, the long term strategy is to reduce the number of small unsustainable villages situated far from job opportunities and socio-economic facilities”. The SDF also contains specific proposals for several strategic intervention zones and areas that needed to be protected, such as critical biodiversity zones, areas of high agricultural potential and crucial aquifers.

The urban core is one of the strategic intervention zones, with an additional detailed urban SDF for the urban centre and highest density informal and tribal areas (see Figure 5.5 & Figure 5.6). An urban development boundary (urban edge) has been drawn tightly around the existing development in the east and west, with expansion opportunities to the north and south. The other primary structuring elements are nodes and corridors, with the CBD as the primary node and Mmabatho government precinct and the North-West University campus as secondary nodes. Mixed land use is encouraged in all the nodes and corridors.

The Mahikeng airport north of Mmabatho features prominently as an industrial development zone. According to the State of the Province address by the Premier, Supra Mahumpelo, a logistic hub at the airport was a provincial priority (Mahumpelo 2017). However, its location distant from major transport routes makes its development as a logistic hub or an industrial area doubtful (Woolfrey 2013).

Mahikeng Municipality's SDF includes a detailed prioritisation and alignment matrix to help the municipality weigh and prioritise the projects identified as crucial for implementation. While the proposals contained in the SDF are sound, offering ideas for solving problems and achieving development goals, the likelihood of the plan being implemented is small because of, among other things, lack of support and the municipality's lack of capacity for planning and implementation.

5.6.6 Lack of support

National and municipal departments participated in the formulation of the plan, but there was little participation by traditional leaders, despite opportunities arranged for their participation. Without their support, it is unlikely that the plan could be implemented in the rural tribal areas. This is the greatest weakness and missed opportunity of the SDF according to Maxim Planning Solutions (2017).

Furthermore, even within Mahikeng Municipality's planning department there appears to be little support for the plan. According to one of the municipal planners, the planning department appears to ignore the SDF. The response we received from the municipality says "not being efficiently used to guide the spatial development of the town as it has been intended to" and "approvals for land use applications (specifically rezoning) have been issued out without consulting and referring to the contents and proposals of the SDF" (Personal response to authors from municipality 2017).

If the planning department does not support the SDF and lobby for its implementation it is unlikely that anyone else will.

5.6.7 Lack of capacity

According to Maxim Planning Solutions (2017), implementation would probably also be hampered by the lack of municipal finances to construct the necessary infrastructure and the lack of capacity within the municipality. Also a matter of concern is the low level of awareness of how important strategic

and spatial planning is for directing development. Furthermore, Mahikeng Municipality has limited authority over land division and land uses because interventions in tribal areas have to be endorsed by the traditional leaders.

According to Mahikeng Municipality there are three other hindrances to implementing the SDF: the bulk infrastructure backlog, the need to formalise the tribal areas to improve service delivery, and the need for a municipality-wide land use (zoning) scheme to give the municipality control over development in the entire municipal area (Personal response to authors from municipality, 2017). Formalisation of the tribal areas would facilitate the provision of services such as water, and formal title over registered land could stimulate economic development. However, such formalisation may be resisted by tribal leaders as they would lose their authority over the land. A similar concern applies to the adoption of a land use scheme.

5.7 Conclusion

Mahikeng's history as a colonial, Bantustan and now provincial capital have shaped its urban core, but it is the traditional authorities who exercise control over most of the land and their residents who may determine the future of the municipality. Often traditional cultures' spatial scales (low density and dispersed in this region) clash with those of today's spatial planners (compact high density settlements) (Cumming et al. 2006), and are contrary to the spatial transformation goals of national policy documents such as the NDP and IUDF.

The densities of the urban core and surrounding suburbs are increasing, but those throughout the tribal areas are low (Selemela & Du Plessis 2016). This drastically increases the cost and difficulty of providing basic services such as water and solid waste management and access to social services such as schools and clinics.

Although the tribal areas are home to most of the population, they are largely a drain on Mahikeng Municipality as they contribute very little to municipal revenue. The urban core is the source of 61% of the municipality's income,

mostly in the form of property taxes and service charges (National Treasury 2018). It is thus imperative, from a financial perspective, for the municipality to protect and enhance the urban core, its primary revenue generating asset. This implies investment in urban infrastructure, such as maintaining the roads and providing efficient waste management, and increasing the intensity and value of development. However, democratic ideals demand that the focus of the municipal expenditure should be the tribal areas where a large proportion of the residents (and voters) live, but where the municipality has little authority and less money to spend. This makes it difficult to decide, as is recognised in the provincial SDF and the municipal SDF (Maxim Planning Solutions 2017), but not in the IDP, where and in what the municipality should be investing.

We suspect it is this predicament that has stymied strategic planning towards spatial transformation. Certainly, Mahikeng Municipality does not appear to have invested in strategic planning and even the planning department does not seem to take the SDF seriously. The outsourcing of this SDF (to Maxim Planning Solutions) may be part of the problem. Lacking the commitment that would come from close involvement in preparing the plan, the municipal planners may have little interest in persuading the rest of the municipality to adopt it enthusiastically and implement it. In Mahikeng Municipality, spatial planning appears to be, at best, on the side-lines and, at worst, a futile exercise.

Mahikeng is not the only municipality with problems of this kind. Many other municipalities that include large areas of tribal land are in similar difficulties, yet national policies (such as the IUDF and SPLUMA) do not acknowledge the complexity of their situation. For municipalities like this, conflicting values and ideals, contested authority over development in tribal areas and limited resources all exacerbate the 'wicked problem' of spatial planning. Spatial, social and economic transformation will require a much broader understanding of the complexity of the situation, including a recognition of the municipalities (limited) resources and the inadequacy of simple policy solutions and instruments in complex contexts.

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CHAPTER 6

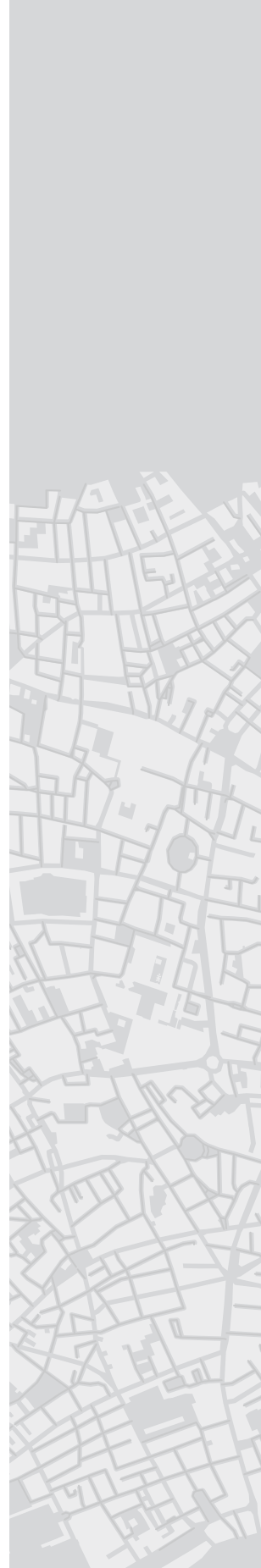
MATJHABENG: PLANNING IN THE FACE OF THE FREE STATE GOLDFIELDS DECLINE

Stuart Paul Denoon-Stevens

6.1 Introduction

The town of Welkom was founded in 1947, shortly after the discovery of gold in 1946 in the area that is today the Matjhabeng LM. Six mines were rapidly established. The town's development was driven by the Anglo-American mining corporation, using 'garden city' principles, but in fact producing a town more akin to those designed by the enlightened industrialists of the late 19th century in England.

Welkom was meant to be more than a mining town. Using the Radburn model, it was meant to be an example of modern urban development. The size of the neighbourhoods,



separated by higher-order roads, was guided by the number of children needed to support a primary school. The park network was designed to connect the town centre to the suburbs, and to ensure that children had a pleasant environment to walk through on their way to school (Brockett 1996; Marais & Nel 2016).

This was a promising start. Welkom's prosperity peaked in the early 1990s, but thereafter the town, and the municipality as a whole, took a turn for the worse. In 2017, Matjhabeng was one of four municipalities with the worst financial performance in the country (Claassen & Kocks 2018). It has a stagnating population that declined by 10% between 1996 and 2016, while in the same period the national population grew by 36% (Stats SA 1998, 2016).⁴ Using 2011 municipal boundaries, Matjhabeng ranks 228th out of 234 municipalities in terms of percentage growth in population from 1996 to 2011 (derived from Stats SA 1998, 2012). The decline was largely because of Matjhabeng's continued reliance on gold mining. The downscaling of Matjhabeng's gold mines has shaken the foundations of its municipal economy.

This chapter looks at the difficulties of planning in the face of powerful market forces, and particularly at how the 'standardised' planning approach for IDPs and SDFs does not encourage recognition of, and thus appropriate responses to, complex market forces. Matjhabeng, with its declining economy, is used as a case study of how these issues play out. This is effectively a 'canary in the mine' example, in other words, a warning to other municipalities of the dangers of not taking adequate account of the limitations that market forces can impose on local areas.

A mining region such as the Free State Goldfields is influenced by events on multiple scales, from global markets to local events at a single mine or in a single community. Likewise, events occur at different timescales, some rapidly and others slowly. Usually the larger scales move more slowly, but this need not be the case (Holling 2001), as local events can occasionally influence international markets. Scale mismatches occur when the cycles of change

4 Note: Data from Stats SA 1998, 2002, 2012 and 2016 were accessed via the SuperWeb2 platform: <http://superweb.statssa.gov.za/webapi/jsf/login.xhtml>.

are 'out of sync' or where one part of the socio-economic and environmental system is disrupted by change or loses its functions or core components (Cumming et al. 2006).

In Matjhabeng, the international gold market drives the economy, national legislation regulates the functioning of the mines and social legacies determine the city's spatial fabric. The physical urban fabric of a city tends to change more slowly than global markets, while local communities are caught in between. In addition to the consequences of scale mismatches, there is the inherent uncertainty of the 'resource rollercoaster' that influences mining operations, investment and employment (Wilson 2004).

The particular focus of this chapter is the link between economic changes in Matjhabeng LM and to what extent these are recognised in the municipality's spatial plans.

6.2 Spatial change and spatial planning

6.2.1 Context and changes in Matjhabeng

Matjhabeng (Sesotho, 'where nations meet') is situated in the Free State province of South Africa. Its main city, Welkom, is roughly 159 km north-east of Bloemfontein and 256 km south-west of Johannesburg. Welkom, including the township area of Thabong, is the largest settlement in the municipality, with 49% of the municipal population in 2011. It should be noted, however, that nearly two-thirds of Welkom's population live in Thabong. The other settlements in the municipality contain a further 49% of the municipal population, and the remaining 2% live in the rural areas (Stats SA 2012).

Table 6.1 shows that Matjhabeng LM went through a period of sharp economic decline between 1996 and 2001, with the real GVA dropping from R32 512 million to R25 894 million, a drop of 20.36%, as clearly illustrated in Table 6.1. During this period the population decreased by 15%, largely because the gold mining sector declined by 51.4% between 1993 and 2001, in real terms (Quantec 2016, not shown in Table 6.1). Marais (2013) showed

that this period of decline occurred after a period of continued demographic and economic growth from 1950 to 1991, peaking in 1991, in terms of both population size and GVA.

TABLE 6.1 Key indicators

Indicator		1996	2001	2011	2016	Change 1996 to 2016
Demo-graphics	Total number of people	476 763	408 170	406 461	428 843	-47 920
	Total number of households	110 221	120 289	123 195	149 021	38 800
	Average household size	4.33	3.39	3.30	2.88	-1.45
	Average annual population growth since previous period	n/a	-3%	0%	1%	n/a
	Average annual household growth since previous period	n/a	2%	0%	4%	n/a
Employment and household income	Total number of people employed (Stats SA)	178 100	95 687	99 650	n/a	-78 450 ¹
	Employed people as percentage of total population (Stats SA)	37%	23%	25%	n/a	-12% ¹
	Average household income (actual)	n/a	31 558	73 211	n/a	41 653 ²
	Average household income (real) – Dec 2016	n/a	65 883	96 457	n/a	30 574 ²
Infra-structure	Percentage of households with indoor water	54%	25%	55%	51%	-3%
	Percentage of households with flush toilet	67%	61%	82%	85%	18%
	Percentage of households with electricity	73%	68%	91%	95%	22%
	Percentage of households living in informal structures	37%	41%	20%	15%	-22%

Indicator		1996	2001	2011	2016	Change 1996 to 2016
GVA (ZAR millions) – Real 2010	Agriculture, forestry & fishing	352	338	375	404 ³	52 ⁴
	Mining and quarrying	21 588	14 022	13 190	13 206 ³	–8 382 ⁴
	Manufacturing	1 206	1 418	2 075	2 321 ³	1 115 ⁴
	Electricity, gas and water	456	436	571	570 ³	114 ⁴
	Construction	351	348	593	674 ³	323 ⁴
	Wholesale and retail trade, catering and accommodation	2 757	2 850	3 822	4 301 ³	1 544 ⁴
	Transport, storage and communication	1 022	1 276	1 711	1 839 ³	817 ⁴
	Finance, insurance, real estate and business services	1 790	2 069	3 184	3 479 ³	1 689 ⁴
	General government	2 011	1 983	2 685	2 919 ³	908 ⁴
	Community, social and personal services	978	1 154	1 541	1 648 ³	670 ⁴
	Total	32 512	25 894	29 747	31 360 ³	–1 152 ⁴
	Percentage of national GVA	2.04%	1.42%	1.16%	1.13% ³	–0.91% ⁴

Source: Quantec (2016); Stats SA (1998, 2002, 2012, 2016)

¹1996–2011, ²2001–2011, ³2015, not 2016, ⁴1996–2015

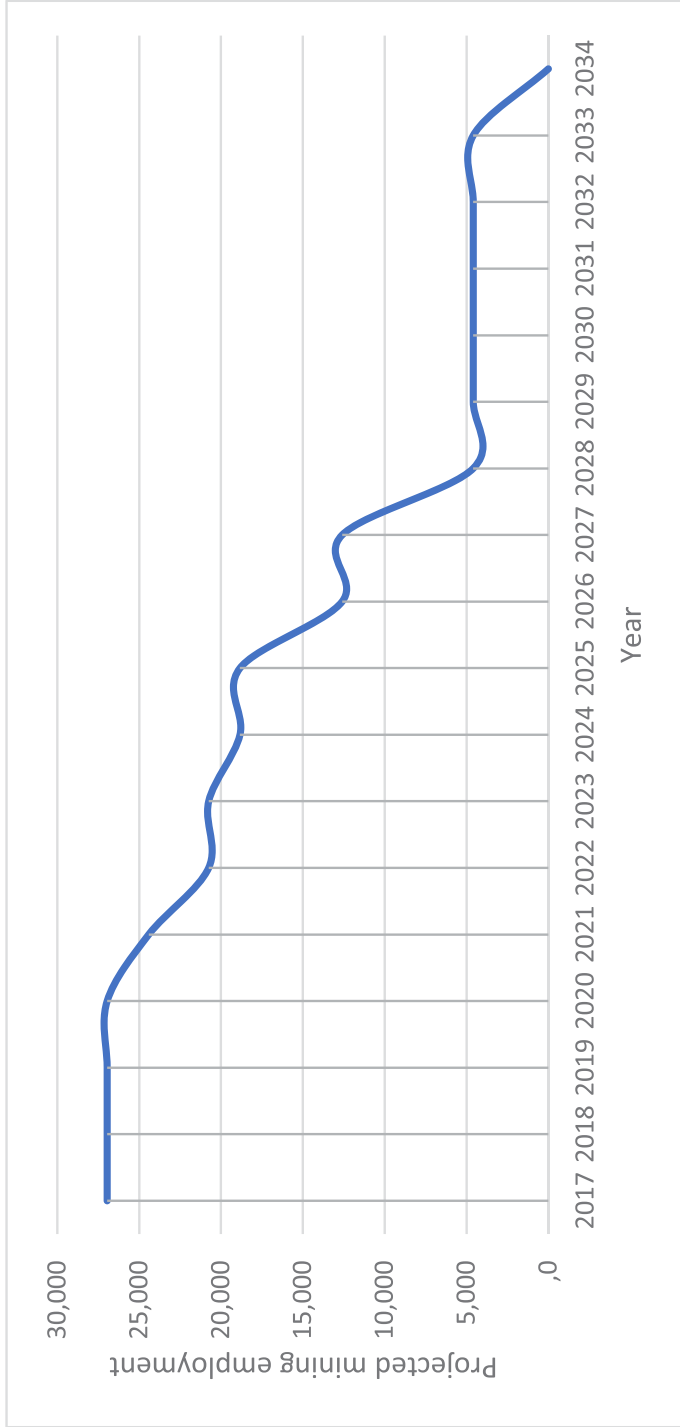
From 2001 to 2016, Matjhabeng's economy went through a relatively steady, or stagnant, period. Population growth was marginal, at 0.34% per annum, compared to the national rate of 1.4%. This period was marked by a growth in the manufacturing and tertiary sectors, matched by a corresponding decline in the mining sector. GVA saw two periods of growth and decline in this period, with peaks in 2005 and 2013 (Quantec 2016, not shown in Table 6.1), but with overall growth averaging at 1.4% per annum, compared to 3.5% nationally. Matjhabeng's overall contribution to the national GVA dropped from 2.69% in 1993 to 1.13% in 2015 (Quantec 2016).

In terms of demographics, this period of limited population growth was partly due to a very high level of out-migration, the second highest in South Africa (Maritz 2015; Stats SA 2002, 2012).

However, the employment figures paint a very different picture. They show a significant and increasing drop in total employment from 1996 to 2011, with total formal jobs dropping from 178 100 in 1996 to 99 650 in 2011 (see Table 6.1). The number of employed people in Matjhabeng was 95 537 in 2001 (23.4%) and 96 678 in 2011 (23.8%), a negligible change. In 2011, Matjhabeng had a labour absorption rate of 36%, which means that in comparison with the national rate of 39.7% it was underperforming slightly in terms of job creation (Stats SA 2012, 2014). Its labour absorption rate was, however, only 0.2% less than the rate for the Free State as a whole (Stats SA 2014).

One of the key drivers of decline in Matjhabeng was mine downscaling, with mining jobs dropping from 180 000 in 1988 (Marais 2013a; 2013b) to around 110 000 in 1995, to just under 20 000 in 2013 (Muller 2017); thus, a massive loss of employment opportunities. The findings are in line with the closure patterns of mines in the area. In the Goldfields area in 1993 there were 44 operational shafts and 23 mining companies (Marais & Nel 2016). In 2017 there were nine mines and three mining companies operating in the area (according to the author's research, although some smaller mining operations may have been missed).

Marais (2013) and Marais et al. (2017) listed the consequences of these mine closures for the Free State Goldfields, including a decline in the municipal population, a loss in the number of skilled professionals, a reduction of the overall labour force (compared proportionally to the wider population of the municipality), and an increase in the level of unemployment and poverty. There has also been an increase in the number of business closures, a deterioration in the municipal sports infrastructure, and a change in the direction of urban expansion. The loss of employment has resulted in the market being flooded with houses, leading to a lowering of housing prices, and increased demands in the area for low-income houses because of the growing levels of poverty and unemployment.



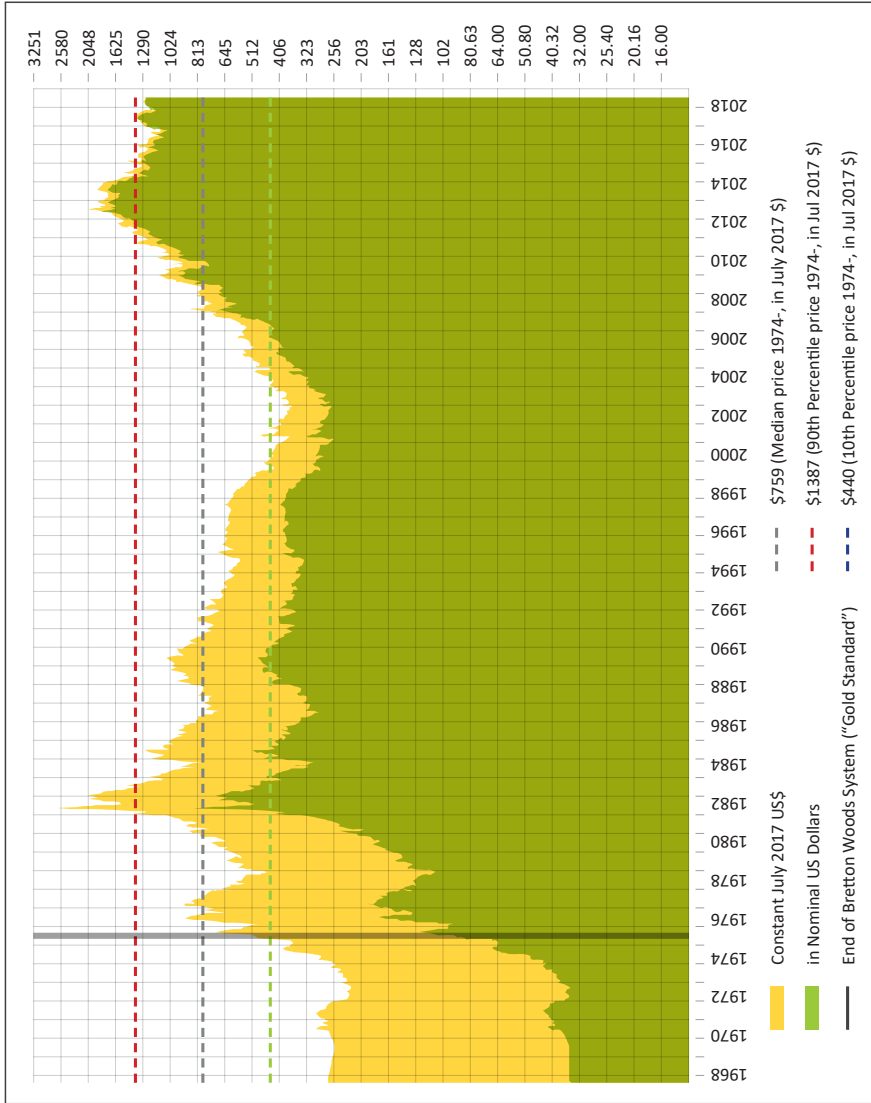
Source: Harmony Gold Mining (2017a, 2017b); Sibanye-Stillwater (2018)

FIGURE 6.1 Projected mining employment, 2017–2034, excluding Tetra4 gas, and possible mining of tailings

To consider future prospects, the author compiled employment figures and life-of-mine figures using annual reports from Harmony Gold Mining (2017a, 2017b) and the integrated annual reports for 2017 for Sibanye-Stillwater (2018). These figures paint a slightly better picture of the present, with total mining employment being 26 955. However, using the estimated life of mine for each of the operational mines in Matjhabeng, it was possible to work out the projected decline in mine employment until 2034 (see Figure 6.1). This picture may of course change in the event of changing market conditions, better technology or discovery of new mineral deposits. But if none of this happens, Matjhabeng will effectively only have one significant mine operating in 2034 (excluding the limited employment opportunities that may arise from mining the tailings of the closed mines). Moreover, this says nothing about the loss of employment opportunities in associated activities, such as processing of ore deposits or provision of services and supplies to the mines by engineering companies. This means there is a strong likelihood that from approximately 2020 onwards we could see a worsening of the situation, and a return to the dire social and economic consequences identified by Marais (2013) with regard to mine closure within the municipality.

6.2.2 Welkom's economy and global market forces

To understand the stagnation of Welkom's economy and the consequent population decline, it is necessary to understand the wider market and the various other factors that drove the decline in the Free State Goldfields. The first, and probably biggest, factor was the decline in the average grade of the gold ore that was mined in South Africa, dropping from 5.15 g/t in 2005 to 2.68 g/t in 2015. What this means is that the mines were getting a smaller quantity of gold for a greater amount of mining effort: in 2005, 49 609 tonnes of ore were mined in South Africa; in 2015, 77 263 tonnes were mined (Chamber of Mines 2017). This lowered profit margins to a point where, for a number of mines, it was no longer profitable to mine gold.



Source: Zhikun He (2017) – with alterations

FIGURE 6.2 Real and nominal price of gold per troy ounce

Other factors that have contributed to this decline in gold mining in South Africa are the escalating costs of production, gold price volatility, the need to dig deeper to get to the remaining gold reserves, which further escalates the cost of production, and labour issues (Neingo & Tholana 2016). To summarise, South Africa has mined most of its prime gold reserves. Most of the gold that is left is more difficult to reach or of lower quality and the mines face rising costs and price volatility. Stats SA (2017) estimates that South Africa will exhaust all its gold reserves within 39 years from 2014, but it must be noted that estimates change frequently and radically. An earlier report from this publication series (Stats SA 2015) argued that in 2003 South Africa had only 22 years to depletion of gold reserves.

It should be noted that these trends are also affected by the gold price, with a higher price making it more profitable to mine gold of lower grades and a lower price making it less profitable. Figure 6.2 shows the average world gold price from 1 January 1968 to 23 May 2018. This price (shown in blue) spiked in 1980 to the highest levels reached in the 20th century, followed by a period of gradual price decline (with peaks and troughs) that reached its lowest point in 2001. This was then followed by further steep increases that peaked in November 2011, after which there was a decline until December 2015, followed by a modest recovery up to May 2018 (the time of writing). The recent rise in the gold price does not seem to have halted the decline of gold mining in Matjhabeng, but it has possibly slowed the process.

6.2.3 Spatial changes in Matjhabeng, 1990–2013

Despite Matjhabeng's economic decline and population loss, between 1990 and 2013 the spatial extent of its settlements increased by about 11% to 15%. Most of this growth has occurred in the townships, driven by the government's initiative to build state-subsidised houses for the poor (Marais, 2018; Marais et al. 2019). While the precise number of houses is unknown, the percentage of households living in informal structures dropped from 41% in 2001 to 15% in 2016 (see Table 6.1), a decrease of 26 795 households living in informal settlements (Stats SA 2002, 2016). In 2016 there were 44 532 households living in government-subsidised dwellings, amounting to 30%

of all households in the municipality (Stats SA 2016). However, the number of households in Matjhabeng has grown, despite the population decline and stagnation. This has apparently been due to household splitting, given that the average household size decreased from 4.33 in 1996 to 2.88 in 2016 (see Table 6.1), significantly lower than the national average household size, which was 3.3 in 2016 (Stats SA 2016).

The consequences of the drive to build low-income houses in Matjhabeng is discussed in detail in the following section, but one critical aspect has been the significant investment in hard infrastructure in a municipality with a declining economic base. There is thus a risk that this infrastructure may be abandoned, while at the same time households are being encouraged to stay in this municipality, despite the lack of an economic base to support them.

6.3 Spatial planning in Matjhabeng: 1994–2018

This section reviews the various spatial plans the municipality has adopted, and discusses how these recognise, or fail to recognise, the economic changes the municipality has faced and is still facing. It looks at how the plans consider the demographics, economic forces and spatial dynamics of the municipality. The first of the spatial plans that guided the municipality's development in the past 30 years was the 1994 Free State Goldfields Structure Plan. This plan predated the formation of the municipality, which was created in 2000, and covered a wider geographical area than just Matjhabeng LM.

The first spatial directives that focused specifically on Matjhabeng were contained in the 2001 IDP (Matjhabeng LM 2006), but the complete spatial *plan* for the municipality was apparently drafted sometime between 2005 and 2009 (see Section 6.3.1). Then in 2013, a fully revised SDF was commissioned and adopted. However, the matter has become complicated because the municipality is incorporating a 'high-level spatial development framework' chapter into their IDP each year, with the maps being taken straight from the 2005/2006 SDF (see Section 6.3.1), not the 2013 SDF (see section 6.3.2), and large portions of the text are a direct cut-and-paste from earlier IDPs. Large sections of the 2016 IDP are the same as the spatial planning chapter in the

2009 IDP, including references to outdated legislation such as the ‘Land Use Management Bill’ (no year, version or official title provided in the IDP) instead of the SPLUMA.

This means that there are two different SDFs in effect in Matjhabeng LM. The IDP (Matjhabeng LM 2016) uses the maps from the 2010/2011 SDF and some of its text (see Section 6.3.1), but the council has also adopted the 2013 SDF as a sector plan annexed to the main IDP (Matjhabeng LM 2014:A19). Given this complicated situation, both documents are reviewed here, but the emphasis is placed on the 2013 SDF.

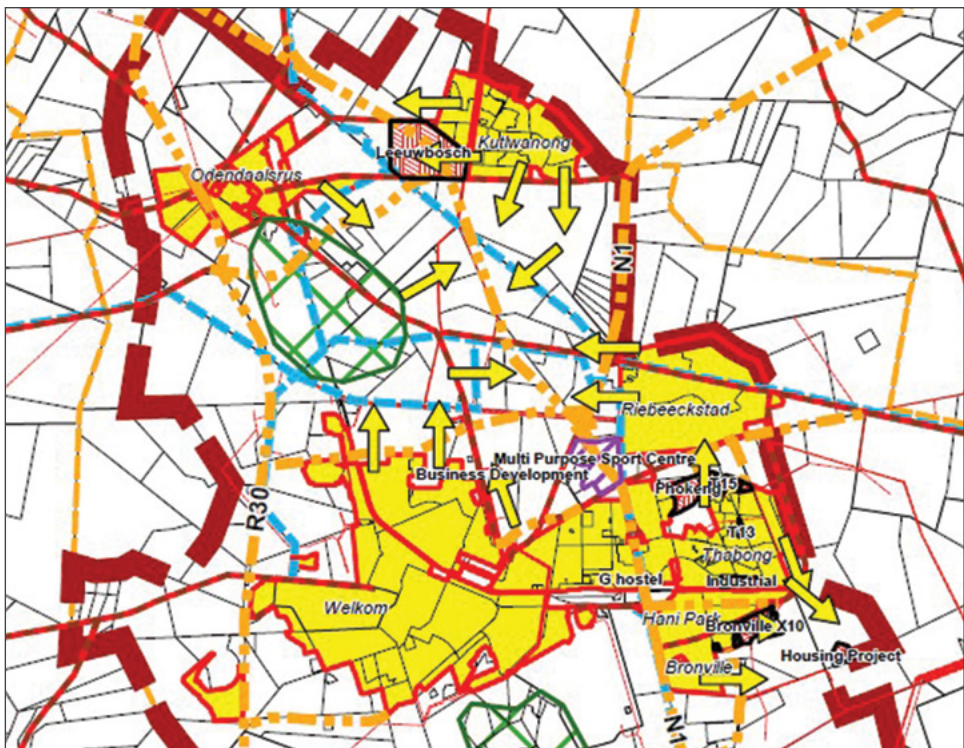
6.3.1 The 2005/2006 spatial development framework

This SDF seems to be a revision of a draft document developed in 2005/2006, which may have had ad hoc amendments after this date, in particular with regard to the drafting and inclusion of the maps. In terms of official status, the earliest IDPs that are available are the 2006/2007 and 2009/2010 versions. The 2006/2007 IDP mentions general spatial principles, but the 2005/2006 SDF is not included. The first mention we have of the 2005/2006 SDF is in the 2009/2010 IDP, which contains most of the same text, and refers to the maps, but omits them from the document. The first time the actual maps are shown is in the 2012–2016 IDP, and thus, technically, this is the first time they had legal status (Matjhabeng LM 2005, 2006, 2009, 2012).

The 2005/2006 SDF identifies the applicable legislation and proposes a series of development principles that promote the integration of previously advantaged and disadvantaged areas, development of industry in the municipality and reuse of mining infrastructure. It also sets out a structure for a longer document to be drafted and identifies a number of projects linked to the rehabilitation of former mining areas, such as construction of a biogas development and the reuse of the Masimong mining complex for community residential units. A number of the projects have since been implemented. The maps provide little guidance for future development, but they do give a tentative picture of encouraging future growth to integrate Welkom, Odendaalsrus and Kutlwanong (see Figure 6.3). Two additional maps give a

more detailed land use picture, and some proposed projects; however, the symbols used make it very difficult to distinguish where exactly these are (Matjhabeng LM 2005/2006).

The main problems with this spatial plan, noting that it was intended to be the interim plan, are the lack of analysis, particularly of demographic and economic issues, and the focus on development and growth. The problem of the municipality's spatial growth, despite the decline and then stagnation of the population and the GVA, and the massive decline in employment, is not recognised at all in this document. It fails to acknowledge the danger of the increasing disconnect between spatial and economic development (or lack thereof).



Source: Matjhabeng LM (2005)

FIGURE 6.3 Extract of 2005/2006 spatial development framework for Matjhabeng

6.3.2 The 2013 spatial development framework

This document was drafted by Matjhabeng LM in partnership with the Department of Rural Development and Land Reform. Throughout this process, consultations with provincial and national departments were facilitated by the Department of Rural Development and Land Reform, and consultations at municipal level were facilitated by the local planning department (Personal communication, Emendo Town and Regional Planners, 2017).

Stakeholder consultation (phase two) was done primarily through seven workshops with stakeholders, which were held in addition to a number of meetings with sector departments and councillors at the municipality, and with local mines and provincial departments. Despite wide advertising, attendance was poor at most of the workshops. Each workshop sought to identify the particular town's problems and hear the stakeholders' views on the vision for that town. Among the problems identified were the closure of the mines and the associated job losses, lack of capacity at the municipality, infrastructure problems and the lack of health care facilities and schools in certain localities (Emendo Town and Regional Planners 2013a; Personal communication, Emendo Town and Regional Planners, 2017).

Some of the more prominent issues identified in the desktop analysis (phase three) were:

Opportunities

- There is potential to diversify agriculture.
- The municipality has assets that can be used to encourage tourism.
- The municipality has a large number of higher-order facilities (for example, colleges and universities, hospitals, magistrates' courts).
- There is an oversupply of public open spaces, some of which could be closed and used for development purposes.

- The municipality has a substantial number of vacant industrial, commercial, agricultural and residential sites, many of which belong to the municipality. These represent a significant development opportunity.

Constraints

- The mines have contributed to fragmentation of the urban area, and mine closure has had a serious negative economic impact.
- A number of mines have closed without being rehabilitated, leaving large tracts of effectively unusable land, posing a serious health and safety risk to the local community.
- Outmigration, particularly of wealthier households, has reduced the municipality's buying power.
- The historically disadvantaged areas lack higher-order facilities (Emendo Town and Regional Planners 2013b).

The stakeholder consultation and desktop analysis (phases two and three) led to the production of the SDF recommendations (phase four). This is a long and comprehensive document of some 137 pages. It assumes a reversal of the current pattern of demographic and economic stagnation, and thus plans for residential and economic growth. It envisages a continuous belt of higher-order land uses from the northern settlement of Allanridge to the southernmost extent of Virginia, totally encompassing Welkom and Thabong. It premises this vision on the establishment of new mines in the area, and aggressive economic promotion by the municipality to encourage the uptake of vacant industrial, business and residential sites. A substantial portion of the document explains how this uptake can be achieved within the municipality, and the maps show where the vacant sites are. The document also classifies each of the urban nodes as having a specific function, based on specific proposed interventions: Welkom/Thabong: Economic; Virginia/Meloding: Tourism; Ventersburg/Mamahabane: N1 Service Node; Hennenman/Phomolong: Agricultural; Odendaalsrus/Kutlwanong: Sport; and Allanridge/Nyakallong: Residential (Emendo Town and Regional Planners 2013c).

In summary, while this document is far more cognisant of the pressures the municipality is facing, it postulates a broad reform of the current patterns of economic and population dynamics towards growth. While it does go into considerable detail about how these economic changes could be achieved, it is likely that this document is overly ambitious in terms of what can actually be achieved. In this regard, it must be noted that the concept of economic diversification in the Free State Goldfields has a long history, with the first commission into this issue occurring as far back as 1960 (Marais & Nel 2016). Despite this long history of attempts to diversify the economy of the Free State Goldfields, there has been limited success in achieving this goal.

6.3.3 The 2015 Matjhabeng by-laws

Normally, a discussion of a municipality's spatial planning processes need not involve the local by-laws, given that SDF requirements are mostly governed by national law. However, the Matjhabeng by-laws (Matjhabeng LM 2015) warrant discussion because of their unique requirements for mine closure and rehabilitation. Sections 35 to 49 require the mine and the land developer to register the venture with both the Department of Mineral Resources and the municipal planning tribunal. The proposed development must be in line with the SDF and SDF Precinct Plans (where applicable) or land use scheme. In the event of non-compliance, the necessary applications for amendment must be submitted to the municipality or the registration of the rehabilitation venture will be terminated. This process requires the sign-off of the rehabilitation plans by the Department of Mineral Resources, a service-level agreement with the municipality for the provision of bulk services, and proof of the sustainability and wider community benefits of the project.

While not constituting a spatial plan in itself, this process represents an attempt by the municipality to actively manage the effects of mine downscaling. The requirements place a legal onus on the mines to ensure that closed mines are redeveloped in compliance with the municipality's broader spatial vision. Moreover, the mines are forced to take into account the needs of the wider community and how the future land will affect municipal services.

The process also typically requires the mine and the developer to create a precinct plan for the site (personal communication, Matjhabeng municipal planner, 2017), to increase the likelihood of future development on the site being spatially coherent.

6.3.4 Precinct plans

The use of precinct plans is fairly unusual for a municipality of this size.⁵ These plans are intended to guide the redevelopment of key strategic areas, particularly the rehabilitation of mining areas. At the time of writing, three precinct plans had been drafted and incorporated into the SDF (Matjhabeng LM 2017: PN 376 of 2016). This chapter uses only one of these precinct plans to demonstrate how these plans work, specifically the Bronville Masimong Precinct Plan, which was approved in 2013. This is a highly detailed plan dealing with the rehabilitation of the area surrounding the Masimong mine, noting that the mine is expected to close in five years' time. The plan covers an area of about 1 063 ha, to be used for residential development of 16 146 units. This was determined by extensive suitability mapping of the precinct to exclude areas affected by mineshafts, slime dams, slime dam seepage areas, floodplains, landfills and other hazards. The plan divides the area into five residential sections, and other sections that are undevelopable or to be non-residential. These are then broken down into a further 21 areas. Notably, extensive calculations have been done to determine the facilities required for each section (Matjhabeng LM, Harmony & LSB Group 2013).

The precinct plan shows there is a partnership between the mines, the municipality and private planners to undertake well-thought-through development of mining and municipal land. It represents a clear attempt to quantify and plan for the necessary bulk service infrastructure and social infrastructure. It does, however, assume there is a need for future urban development in this municipality.

5 The simplest of the various definitions of 'precinct plans' is that they are spatial proposals for an area which is part of a wider settlement, and whose scale can vary from that of a single large site to a whole neighbourhood.

6.4 The difficulty of making realistic plans in a situation of economic stagnation

With its economic base eroded by the decline in mining and its population stagnating, Matjhabeng presents a wicked problem for planners (see Chapter 2, this volume). Its plans do not sufficiently recognise the complexity involved but continue to focus on growth. The 2005/2006 SDF is based on a premise of growth, and the 2013 SDF, while recognising this, offers a bold plan to change the municipality's economy and demographics. This plan, while admirable, is unrealistic in terms of what can be achieved, given the weak capacity of the municipality, the diminishing gold reserves and the power of global market forces. The obsession with growth, along with failure to understand and respond to economic forces, poses the danger that Matjhabeng will continue to invest in infrastructure for growth and continue to provide state-subsidised housing. The likely outcome of this will be a municipality whose economy depends primarily on social grants and government salaries – an unsustainable, and most certainly undesirable, situation. For more on this, see Denoon-Stevens et al. (2018).

The question, then, is why Matjhabeng continues to emphasise growth in a situation of economic decline. As with all wicked problems, the answer is not simple but multi-layered.

The first layer of this complexity is the messiness of the data, which makes it difficult to ascertain for certain whether Matjhabeng is facing growth, stagnation or decline. According to the most recent population figures, the population has actually started to grow again, and household growth has continually shown a picture of gradual increase (see Table 6.1). In contrast, the economic picture, in terms of GVA and number of people employed, seems to be one of stagnation, and employment figures for the municipality (Quantec 2016) show a significant decline in employment opportunities. These data make it difficult to create an air-tight argument that the municipality is actually losing its economic base, despite the clear evidence of mines closing down. The modest recent growth in population might be perceived by some as

a ray of hope. This, however, ignores the reality that mining jobs will continue to be lost, and production in other economic sectors will be unlikely to fill the gap.

The second layer is the legislation and policy that emphasise growth. For example, the municipal planning and performance management regulations say an SDF “must indicate where public and private land development and infrastructure investment should take place” (Department of Provincial and Local Government 2001: S2(i)(i)). This tacitly assumes the necessity for such development and thus discourages questioning. To avoid overstating the case, it should be noted that these regulations could legitimately be taken to include planning for decline, but this is clearly not their obvious intention.

The third layer is the global culture of planning that emphasises growth. Hollander et al. (2009:227) noted that “large parts of growth-oriented American and European cultures have an aversion to planning for shrinking cities”. They said that this dislike goes far deeper than the field of planning. Western civilisation may indeed have a tropism toward growth in planning, economics, personal life and many other fields. Shrinkage, or at least its perception, thus becomes a threat or a taboo. Planning for shrinking cities comes to be equated with accepting an unhealthy decline. Aiming for economic growth in order to regain population growth – an uneasy compromise – is the most typical response of planners and politicians, a strategy that rarely leads to success anywhere.

The fourth layer is planners’ belief that they can use a paper plan to effect large-scale change in the municipality, in effect creating a ‘grand vision’. This is particularly evident in the 2013 SDF, which does acknowledge the demographic and economic changes the municipality is facing but chooses to postulate that these changes can be reversed with the bold actions proposed in the plan. This harks back to a model of planning that saw the market as subservient to the master plan and had confidence in the planner’s ability to foresee future changes. This paradigm dominated post-World War II planning

and had already been discredited as far back as the 1970s (Hall 1974). Today planning is regarded as a process of mobilising and bringing together the various actors and using the skills of negotiation and mediation to arrive at a common vision for an area. Settlements are also now recognised as complex spaces which cannot be understood using simple theoretical frameworks (Todes 2011). But Matjhabeng, in the 2013 SDF in particular, still apparently relies on the outdated 'grand vision' model of planning and believes that an unpleasant reality can be reversed by such a vision. It thus overlooks the need for municipal planners to explore and plan for multiple possible future scenarios, to foster partnerships and build institutional capacity for radical change, and to frequently adapt their plans to the changing circumstances facing the municipality. Further, the flexibility of local planners and the possibility for them to engage multiple possible future scenarios, within the constraints of the existing planning system, might possibly itself be a challenge.

The fifth layer is the political dimension of a municipality, which may discourage the bold strategies required to deal with its demographic and economic problems, such as ceasing to invest in freestanding state-subsidised housing and focusing instead on serviced sites and social rental housing,⁶ or encouraging out-migration from the municipality in order to reduce the pressure on the declining economic base. Such strategies might be unpalatable to politicians, as they would be tantamount to admitting that the municipality is in decline – which would not look good and might impair their chances for re-election. Not only politicians would resist such strategies; for municipal officials, planning for decline or downsizing would mean accepting a smaller budget, and possibly staff reductions, which would be hard to stomach.

6 'Freestanding state-subsidised housing' means a serviced site with a complete house that the state provides free to low-income households (with the income parameters being for those earning below R3 500). 'Serviced site' means a plot with services such as electricity and water installed, but no house being built by the state (for the same income band as freestanding state-subsidised housing and also provided at no cost). 'Social rental housing' means a house rented out by the state at a discounted rate to low-income households, typically servicing a slightly wealthier market than freestanding state-subsidised housing.

More layers can be discerned: the demands of poorer residents of Matjhabeng for the services and houses the government has promised them, the pressure by provincial and national government to build new houses and provide infrastructure. The net consequence of this is that if a planner employed at Matjhabeng LM, or a consultant hired by the municipality, wants to talk about 'downsizing' or 'shrinking' the city to match the decline in employment opportunities in productive sectors, the sheer weight of these layers makes it highly improbable that they will get a hearing.

6.5 Conclusion

The discussion in the previous section has highlighted the various layers of ideology, reality and politics that make up the complexity of planning for a municipality that is undergoing structural economic and demographic changes. This discussion challenges the emphasis in South African planning on paper plans: many of the pressing problems faced by municipalities cannot be solved by a simple document. This discussion, however, also explains why simple documents are preferred – they tend to present an attractive window-dressing of a 'grand' future. However, the visions presented in Matjhabeng's various plans are unlikely to be achieved, given the unrealistic assumption of economic growth, despite all evidence pointing to economic stagnation. Maybe with radical action on the part of the municipality this trend of economic stagnation could be reversed, but it is highly doubtful that the municipality has the capacity, or mindset, to take such actions.

Matjhabeng needs a more messy and flexible planning process, involving relationship building, using marketing and persuasion to make unpleasant realities palatable to politicians, residents and other officials, and accepting and planning for an uncertain future. Such a process will result in a document that will not paint a rosy picture but will capture and solidify the partnerships that need to be created, the multiple possible futures that need to be explored and the key actions the stakeholders will need to take.

To achieve this, it will be necessary to improve many municipal planners' strategic spatial planning skills and teach them how to plan where there is little direct control over the decisions made by external parties acting in different socio-temporal scales. The challenge therefore, is not simply to prepare better spatial plans, but to change the institutional and ideological frameworks that lead to simplistic planning documents and hinder planning efforts that truly embrace uncertainty and complexity. Such leadership at the municipal sphere is critical.

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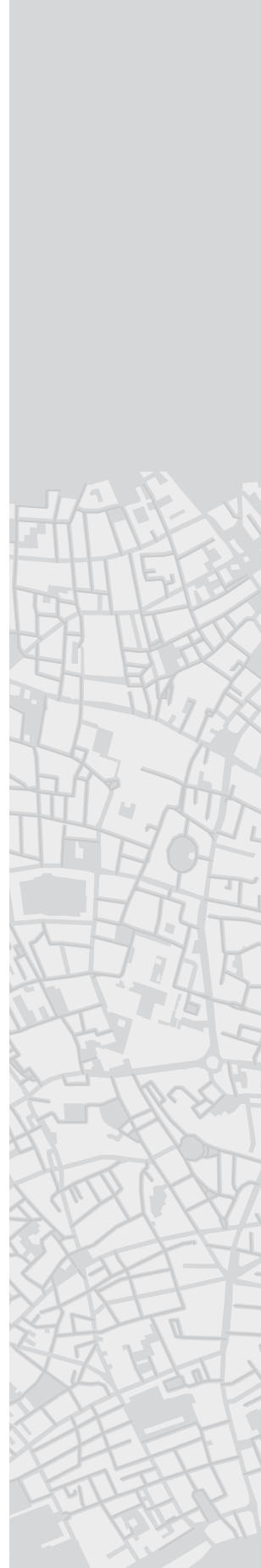
CHAPTER 7

MBOMBELA: A GROWING PROVINCIAL CAPITAL AND TOURISM DESTINATION

Maléne Campbell

7.1 Introduction

The history of Mbombela LM, formerly Nelspruit, goes back to the 15th century when Nguni people, ancestors of the Swazi and Ndebele nations of Mpumalanga, arrived from the north with their herds of cattle and built stone-walled houses for their settlements in the area. In the 18th century this tribal region was called KaNgwane, after the Swazi king Ngwane. In 1873 the discovery of gold brought many prospectors to the area. It was named Nelspruit for its creek (spruit) and for the three brothers of the Nel family who grazed their sheep



and cattle in the area in winter from 1883 until 1896 (Nelspruit Post 2017). Nelspruit gained importance from its position on the railway line that was built to connect the Witwatersrand goldfields with the port of Delagoa Bay (now Maputo). Today it is a major tourism centre, popular for its own scenic attractions and as a gateway to the Kruger National Park. In October 2009 the city's name was changed to Mbombela (Swazi, meaning 'a lot of people in a small space').

The city's location close to the Kruger National Park, its status as the capital of the Mpumalanga province, its new university (the University of Mpumalanga, established in 2014) and its growing attraction as a retirement niche, have all contributed to Mbombela's prosperity. However, apartheid spatial planning has left its mark on the city. Unlike most South African cities under apartheid, Nelspruit did not have black townships located directly adjacent to it. Instead, the townships were located behind the boundaries of the homelands, which meant that black people working in the city had to travel long distances daily. Mbombela's economic prospects are more encouraging than those of the other case study cities in this book. But like the other cities it suffers from spatial problems caused by its historical spatial segregation and fragmentation. Only a few academic studies have been done of Mbombela's spatial planning problems, perhaps because of the absence, until recently, of a university in this city.

Planners concerned about the well-being of all citizens still have the challenge today of planning 'in the face of power' (Forester 1982) as they did under apartheid. Furthermore they also have the problem of planning in the face of uncertainty. They have to draft and implement policy while taking economic, environmental and social uncertainties into consideration in a rapidly changing world (Balducci et al. 2011). This means that prescriptive, long-term, strategic spatial plans will have their limitations. Consequently, since the 1990s, planners have adopted a strategic approach of short-term plans to address complex problems. Albrechts (2004:743) proposed a longer-term vision – held by many stakeholders – of 'shared futures', and "the development and promotion of common assets", emphasising the necessity for a flexible

approach to planning and policymaking. Such an approach must also consider the complexities and contradictions that planners deal with (see Chapter 2, this volume). It is in the context of flexibility and complexity in planning that this chapter assesses spatial planning in Mbombela.

7.2 Spatial change and spatial planning

Mbombela LM is situated in the Ehlanzeni District Municipality of the Mpumalanga province. The municipality was formed in 2000 when the Demarcation Board amalgamated the Hazyview, Nelspruit and White River local councils (Mbombela LM 2011). The local municipality is today referred to officially as the City of Mbombela LM. Urban areas in Mbombela LM include the city of Mbombela, formerly known as Nelspruit, the towns of White River and Hazyview, and former homeland towns such as Kabokweni, Kanyamazane and Matsulu. For operational purposes, the municipality is divided into five zones: three in Nelspruit and one each in Hazyview and Nsikazi (Figure 7.1). Between 1948 and 1994 the apartheid government established ten self-governing territories, called 'homelands', for black ethnic groups under the Bantu Authorities Act (Act 68 of 1951) (RSA 1951), which allowed for the establishment of tribal, regional and territorial authorities. These former homelands were reincorporated into South Africa and absorbed into the newly established provinces in 1994. They remain under the control of the traditional authorities, but municipalities have to provide services to all areas within their boundaries, including those under traditional authorities. Mbombela has nine traditional areas: Gutshwa, Lomshiyo, Masoyi, Mbuyane, Mdluli, Mpakeni, Msogwaba, Nkambeni and Kgarudi (Mbombela LM 2012).

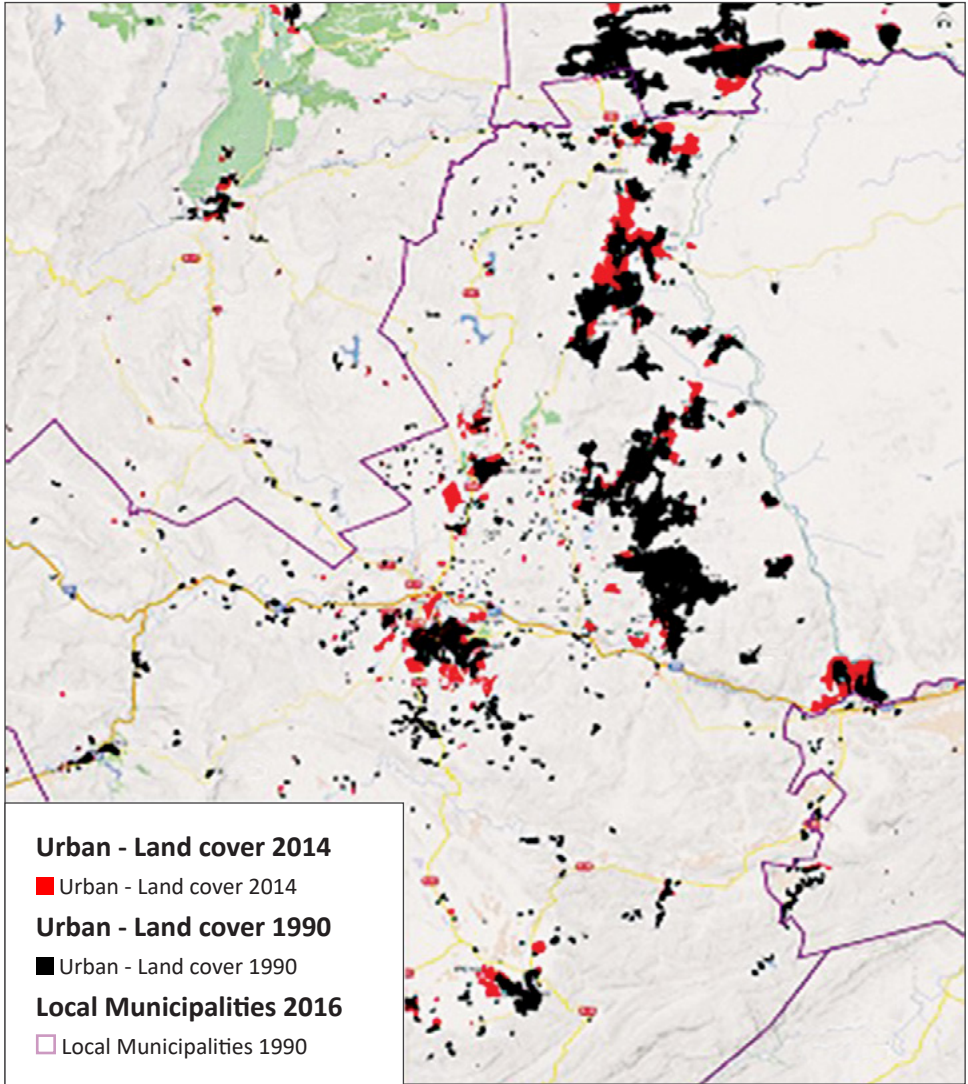
7.2.1 Spatial and population change

Significant spatial change took place in Mbombela between 1990 and 2014. During that time, urban land cover increased by 3 973 km², an increase of 16%. Some land extensions has taken place adjacent to and to the north of a former homeland area. Two distinct forms of urban sprawl are evident. The first is the dense informal settlement towards the east, inside the former homeland

boundary. The populations of Kanyamazane and Kabokweni have not grown much, and may even have declined, but large numbers of people still remain in the area. The second form of sprawl consists of middle-class housing and retirement villages in and around the original Nelspruit. This kind of sprawl happens when there are residential developments on prime agricultural land or on the periphery, which makes them costly to service. Both forms of sprawl can be seen around White River. Densification helps to reduce sprawl, but one house per site increases it. An urban edge can help to limit sprawl, but it can encourage sprawl if it is determined at an excessive distance from the centre.

Mbombela has experienced urban sprawl because of an increase in middle-class housing, including retirement villages, and because informal settlements have developed in and around the main urban areas and on traditional land (or areas adjacent to a former homeland area), despite no growth in their population. This is largely because land in Mbombela is easy to obtain and affordable. However, the government is unable to provide urban services on land that falls under traditional authorities.

Despite the urban sprawl, there has nevertheless been an increase in overall density. Between 1996 and 2011, land cover increased by 16% in Mbombela while the number of people increased by 38%, from 426 000 to 589 000. However, only 22% of the municipality's population officially live on urban land, i.e. land managed by the municipality. Many people living in the former homeland areas are functionally linked to the urban economy, but their land management system falls under the traditional authorities. Mbombela's population increased by well over 2% per annum between 1996 and 2011, which is substantially higher than the national average of around 1.5%. Between 2011 and 2016 the number of people decreased in the urban areas while increasing in the rural areas. A possible explanation for this is the lower cost of living in the rural areas, as residents in the areas under traditional authority do not pay property tax or for municipal infrastructure because the municipality has not been able to provide services.



Source: MapAble (2017)

FIGURE 7.1 Urban growth of Mbombela Local Municipality from 1990–2016

7.2.2 The city's economy

Mbombela is one of only four case study cities in this book that have a diversified economy (the others are Msunduzi, Polokwane and Sol Plaatje). Mbombela's status as the capital of the Mpumalanga province since 1994, and its new international airport, have greatly encouraged economic diversification. Other diversity-encouraging factors (mentioned above) are its proximity to the Kruger National Park, its growing retirement industry and its new university. Mbombela also serves as a higher-order regional service node. Many children from Mozambique and Swaziland attend private boarding schools in either Nelspruit or White River. The town of Nelspruit also provides higher-order agricultural services to the surrounding farming communities.

Mbombela's economy grew at an average of 2.7% per annum between 1996 and 2015, peaking at 3.1% per annum between 2001 and 2011. These growth rates are largely equivalent to the national averages. Between 2001 and 2011 the approximate number of people employed increased from 100 000 to 164 000, unemployment dropped from 38% to 28%, youth unemployment dropped from 47% to 38%, dependency dropped from 63% to 52%, and increases in the average household income outperformed the Consumer Price Index (Stats SA 1996–2011).

Between 1996 and 2015, economic sectors in Mbombela that grew faster than the average annual economic growth of 2.7% were mining (5.7%), construction (3.9%), wholesale and retail (3.1%), transport (5%), finance (3.2%) and community services (2.8%) (Stats SA 2016). The growth in mining is insignificant, since mining contributes only a minuscule percentage towards the economy of Mbombela. It is, however, something the municipality has to monitor closely, as mining often has serious spatial implications. The above average growth in construction is the result of an increased demand for housing when Mbombela became the capital of Mpumalanga, the growth in retirement and tourism industries, and large scale investments such as the construction of the Mbombela soccer stadium, which was one of the ten locations of the 2010 FIFA (Fédération Internationale de Football Association) World Cup. These factors have spatial implications and contribute to urban sprawl. The higher than average growth rates in transport and finance are

associated with the regional services function – which often extends beyond the borders of South Africa and includes Swaziland and Mozambique – and also probably with the growth in tourism. Community services grew largely because Mbombela was declared the capital of Mpumalanga.

7.2.3 Municipal finance

Table 7.1 shows that the municipality's financial situation is healthy. Salaries are below 25% of municipal income, and expenditure on maintenance suggests that the municipality is performing this function adequately. Income from property tax as a percentage of total income is high; but, since this may be largely because of the growth of higher-income suburbs, one of the consequences is sprawl, a problem the municipality is inclined to overlook for the sake of the property tax income.

TABLE 7.1 Mbombela municipal income and expenditure, 2006/2007 and 2015/2016

Indicator	2006/2007	2015/2016
Total income	855 388 834	2 158 741 341
Total income from property rates	128 097 290	335 673 587
Income from property tax as percentage of total income (self-generated income)	15.0	15.5
Capital expenditure budget as percentage of total budget	15.5	Not possible to determine
Total expenditure	835 994 479	2 114 873 927
Total capital expenditure	129 454 466	0
Expenditure on maintenance	57 684 962	183 926 438
Expenditure on maintenance as percentage of total expenditure	6.9	8.7
Expenditure on salaries	176 301 175	520 920 770
Expenditure on salaries as percentage of total expenditure	21.1	24.6

Source: RSA, National Treasury (2015–2016)

7.2.4 Municipal infrastructure

The official figures from Stats SA show that the number of households in Mbombela almost doubled from 1996 to 2016 (Table 7.2). Although the number of households with indoor water, flush toilets and electricity increased during this time, the proportion with these services did not increase in all cases because of the substantial growth in the number of households and the location of many of these on traditional land. A reasonable guess as to why indoor water supply goes up and down is that if a household stopped paying for water they could have been cut off by 2001 and reverted to using a public tap, and then accessed the free basic supply (which started in 2002) in their home by 2011. The large increase in the number of people living in informal structures, from 7 182 in 1996 to 14 289 in 2016 (Stats SA 1996–2011, 2016), is a matter of concern for spatial change and transformation in Mbombela. It implies that the informal settlements are spreading, increasing the urban sprawl and making service provision more difficult. Furthermore, the relatively low levels of services indicate how difficult it is to provide urban services on land held under the management of traditional authorities, especially in a municipality where the proportion of urban land is small.

TABLE 7.2 Profile of household infrastructure in Mbombela, 1996–2016

Indicator	1996	2001	2011	2016
Total number of households	91 584	112 321	161 773	181 794
Number of households with indoor water	36 834	23 283	60 097	43 427
Percentage of households with indoor water	40.2	20.7	37.1	23.9
Number of households with flush toilet	24 450	30 315	54 649	58 923
Percentage of households with flush toilet	26.7	27.0	33.8	32.4
Number of households with electricity	44 910	81 231	145 922	174 751
Percentage of households with electricity	49.0	72.3	90.2	96.1
Number of households living in informal structures	7 182	10 003	7 816	14 289

Source: Stats SA (1996–2011, 2016)

7.2.5 Areas under traditional authorities

The Traditional Leadership and Governance Framework Act, Act 41 of 2003 (RSA 2003), requires partnerships with local governments to be based on mutual respect, recognising the status and roles of the respective parties and being guided by the principles of cooperative governance. Traditional leadership and land management are common in Africa and, in keeping with the policy of separate development, the apartheid government promoted these authorities. The Constitution of the Republic of South Africa, Act 108 of 1996 (RSA 1996) recognises traditional authorities and their role in local government, and the SPLUMA recognises their role in local government.

However, despite the intent to collaborate, contained in current policy and legislation, the reality is somewhat more complex. The Umsebe Development Planners (2016:86) mentioned in their report that traditional councils have resorted to “establishing new settlements and extending the existing ones on their own”, and usually “without consulting their respective municipalities in terms of [the] installation of bulk services”, but that “traditional councils do levy their subjects for land allocation”.

Approximately 500 000 people, amounting to 89 000 households, live in Mbombela’s nine traditional areas, where the land is not surveyed and is the property of the national government. Once it has been surveyed, a land surveyors’ plan provides the cadastral information and contours needed by a municipality to service the area. Instead of paying property tax or paying for municipal services, the residents in these areas are required only to contribute a small annual fee, which is paid to the tribal chief. In this municipality, the traditional authorities charge a once-off fee of between R180 and R350 for residential sites and R1 000 to R1 300 for business sites, along with an annual levy of between R12 and R25 (Umsebe Development Planners 2016). The general manager of planning said that the municipality initiated a number of land tenure upgrading projects in 2018 in these areas and, despite these projects being welcomed and accepted by the communities, most traditional councils were strongly opposed to them, mainly for fear that they would lose power and control over the management of land and their communities.

The traditional areas in Mbombela LM are a long distance from employment opportunities, so the residents daily commute for work to Hazyview (35.9 km one way) and Mbombela (45.1 km one way). Buscor (Pty) Ltd provides a passenger bus service and still receives a subsidy from government. The public transport from these areas is frequent, generally reliable and reasonably affordable. An interviewee from the private sector said the cost of an approximately 90 minute (depending on the traffic) taxi trip to work and back was about R18.

There are serious concerns about settlements on traditional land. The difficulty of servicing them has been noted above. These settlements often spring up in the wrong places, for example where the gradient is too steep, or the soil is unsuitable for development, or below the flood line or in a wetland. The physical difficulties are complicated by the inability of the municipality and the traditional authorities to find common ground with regard to service delivery. The unsuitable locations, where livelihoods and lives of vulnerable households are at risk because of flooding, also endanger people. About 39% of the households in the traditional areas have built houses below the flood lines or in wetlands, putting them at serious risk (Mbombela LM 2016/2017). Although the municipality has established a unit specifically to manage issues related to traditional authorities, these concerns remain.

7.2.6 Main spatial challenges

Mbombela has six interrelated spatial problems. However, these problems are not merely spatial, but also related to topographical challenges, administrative issues and insufficient access to information and communication technology:

- The low residential densities, resulting in low thresholds, make it difficult to run an efficient public transport system. There is a direct link between the density of the residential development and the potential to provide facilities as close as possible to residents, and in some cases just to achieve walking access. A clearly defined approach to settlement land use planning is necessary for the support of an efficient, structured public transport system. Nodes should not fall short of the threshold of demand necessary to support a high-frequency public transport.

- It takes a long time to travel from the distant traditional authority areas to the areas where there are job opportunities.
- The city's topography is mountainous and therefore not all areas are suitable to infill development, and although it is possible to develop on some of the steep slopes, the engineering services for such developments are costly.
- The municipality and the traditional authorities have to accept each other's authority to provide the basic services mandated by the Constitution and to manage their communities, but they sometimes come into conflict.
- The vast majority of the population, about 500 000 people, live in areas traditional authority areas on land that is not surveyed.
- About 47 000 households in the rural areas have no communication coverage for mobile phones, internet connections or landlines and are therefore unable to call for help in the case of a disaster. Access to information and communication technology is a critical aspect.

7.3 Spatial development framework

The current 2011–2030 SDF was compiled by Umsebe Development Planners and approved by the Mbombela LM Council in 2012, a year before the enactment of the SPLUMA and four years before the IUDF was implemented (RSA CoGTA 2013). No provincial SDF was available at the time of the study, but the district SDF was consulted. The 2011–2030 SDF is currently under review. The assessment in this chapter is based on the SDF that was approved in 2012.

Mbombela's 2016/2017 IDP uses the imperatives of the New Partnership for Africa's Development as its normative position. These include management and resolution at subregional and continental level, participatory governance, and diversification into agro-industries and manufacturing for domestic and export markets (Mbombela LM 2017a). The IDP is furthermore aligned with the strategic imperatives of the NDP. These include sustainable livelihoods,

rural development and integrated human settlements. An interviewee from the public sector noted that Mbombela LM had compiled a diagnostic report based on the NDP.

The vision of the national Comprehensive Rural Development Programme Framework (RSA Ministry of Rural Development and Land Reform 2009) was to create sustainable rural communities. One of the ways this was to be achieved was by upgrading infrastructure, which was perceived or expected to contribute to social transformation (Mbombela LM 2012). Agrarian transformation is thus one of the priorities of Mbombela's SDF. Since the NDP recognises tourism as one of the drivers of the national transformation agenda (RSA Department of Tourism 2016), strengthening transformation and empowerment also became one of the initiatives of the Mpumalanga Tourism Growth Strategy (Mbombela LM 2012).

Mbombela's SDF is based on the five principles of the National Spatial Development Perspective (RSA The Presidency 2006). These principles were intended to promote rapid economic growth; ensure that the government fulfils its constitutional obligation to provide water and energy services and health and educational facilities; focus government spending on fixed investment in localities of economic growth or with the potential to create long-term employment and stimulate sustainable economic growth; address social inequalities by focusing on people rather than places; and develop activity corridors and nodes close to the main growth centres in order to overcome the inherited spatial segregation (RSA 2006). A service provider was recently appointed to review the 2011–2030 SDF, and CoGTA was to monitor the reviewed 2017 SDF for compliance with SPLUMA.

7.3.1 Spatial priorities and plans

The 2007 SDF and the current 2011–2030 SDF, which is a review of the 2007 SDF, list 13 spatial priorities: nodal development; integration of development nodes; urban and rural regeneration; linking urban and rural development with social and engineering services; environmental sustainability; development of rural service areas; development of urban centres; collaboration with

traditional authorities on land managed by those authorities; promotion of sustainable development; compilation of a framework for private and public sector investment; compilation of a framework for natural resource management and land use management; compilation of a framework to guide major transport routes; and compilation of a framework to facilitate the development of an aesthetic urban form. Provision is also made for large-scale capital projects, such as nodal development on the Eastern Corridor between Mbombela and White River, affording residents closer proximity to employment, and a cargo section at the Kruger Mpumalanga International Airport.

The municipality has implemented an urban edge policy and a residential development policy. Development is further being intensified in economic opportunity zones. The Nsikazi Activity Corridor and the Nelspruit/White River Activity Corridor have been identified and implementation has started. Proposals have been submitted for mixed-use developments in the Mataffin Precinct. There are also plans for the Mataffin Economic Opportunity node to create a desirable and sustainable residential neighbourhood at the Matsafeni Village.

An objective of the 2011–2030 SDF is to enable the chiefs and headmen to allocate stands suitable for human settlement by surveying sites in the traditional areas. The municipality has begun by surveying and formalising government properties such as schools and police stations. A thorough community engagement policy, known as the Community Engagement Formalisation Process for Land Tenure Upgrade (Mbombela LM 2017b), has been drafted to assist in the formalisation process, which involves the transformation of vacant land that is suitable for residential uses. This process comprises township establishment and the approval of a general plan.

7.3.2 The N4 Maputo corridor

The Mpumalanga Integrated SDF (Mpumalanga Provincial Government 2007) informed the 2011–2030 SDF. As a result, the N4 Maputo Corridor was identified as one of the key objectives to stimulate regional cooperation and

economic development by reviving this trade and tourism route (Campbell et al. 2012). The N4 road, which passes through Mbombela, was realigned about five years ago and a bypass was built outside Mbombela. This had the envisaged outcome of discouraging large freight vehicles from passing through the city.

The establishment of a university in 2014 was highlighted as a skills and development priority for the growth and development of Mpumalanga (Mpumalanga Provincial Government 2008). The former Lowveld Agricultural College in Mbombela is now the University of Mpumalanga and offers programmes that lead to qualifications in subjects such as forestry and agriculture, which are relevant to the Lowveld area and the Mpumalanga province.

7.3.3 Participatory planning

A thorough public participation process was followed during the 2012 review of the 2007 SDF, but an interviewee from the public sector remarked that the sessions were not well attended. The public participation process was in line with the Stakeholder Participation Policy for Mbombela LM, which was prepared according to the Municipal Systems Act, Act 32 of 2000 (RSA 2000). Interviewees from both the public and private sector confirmed that the project steering committee had included the Lowveld Chamber of Business and Tourism, the nine traditional authorities and the municipal engineers. The implementation phase of the 2011–2030 SDF incorporated a capital expenditure framework with projects, timeframes and implementation agencies. One of the major difficulties in achieving the key objectives set in the 2011–2030 SDF is that in the process of developing the municipal SDF, the municipality must consult the traditional authorities and afford them the opportunity to provide feedback on proposals that will affect their land. These objectives are:

- To compile a framework for private and public sector investment;
- To promote sustainable development in the built environment;

- To compile a framework on natural resource management and land use management;
- To guide major movement routes;
- To facilitate the development of an aesthetic urban form.

7.3.4 Balancing urban and rural land development

The constant demand for land for residential and industrial development is an ongoing threat to both economic development and national food security, which depends on the availability of prime agricultural land. Through a strategy for the protection of fertile agricultural land, Mbombela LM tries to ensure that development does not compromise food security or encroach on prime agricultural land in the municipality (Mbombela LM 2016/2017). There is currently a boom in the demand for nuts, particularly macadamia nuts, which are predominantly exported to China. The municipality has about 100 000 ha of macadamia orchards and the profit per hectare is between R20 000 and R1 million.

Balancing agricultural needs and the need for land for residential development still poses a challenge. Much of Mbombela's mountainous terrain cannot be developed. An interviewee from the local municipality said that in order to protect prime agricultural land with high yields, the Department of Agriculture, Forestry and Fisheries refuses to approve development applications outside the urban edge. Urban sprawl is widespread in Nsikazi, where the traditional areas are situated. In contrast, retirement villages like Bateleur Estate are located within the urban edge, although on the outskirts of Mbombela. Uncontrolled urban growth in urban areas that are ill-prepared for these challenges, leads to urban sprawl, which results in the ineffective use of urban infrastructure and low-density housing. Other negative aspects associated with urban sprawl include 'leapfrog' development and a loss of farmland at the urban edge.

Areas reserved for new developments, mainly for residential purposes, are near the old Nelspruit airport and adjacent to the Bateleur Estate. A problem for the municipality is to decide how much agricultural land can be compromised for residential development.

7.3.5 Integrated development

Nelspruit has a lively CBD with many businesses that rely on large numbers of pedestrians. Offices of national government departments are located in the CBD and there is a new High Court building. The regional offices of companies such as Absa, PriceWaterhouseCoopers and First National Bank are located in the extended CBD, in houses that were formerly zoned for residential purposes.

White River, a 30-minute commute from Nelspruit, serves as a nodal development for housing. HL Hall & Sons (an agricultural pioneer of the Lowveld) developed the Riverside Precinct, a compact and integrated business, residential and recreational node. This infill planning helps to prevent lengthy commutes. Further phases of this development have been a motor town (an area for car sales, servicing and testing), industrial developments, an award-winning structure housing the Mpumalanga Legislature and the Riverside Mall. These developments have helped to bring White River and Nelspruit closer together.

The 2011–2030 SDF encourages the municipality to pursue compact development and protect environmentally sensitive land. The higher densities of a more compact city will provide the higher thresholds that are needed for a viable public transport system. The 2007 SDF noted that most people from the Nsikazi area had daily commutes of up to two hours and it therefore suggested that jobs should be created close to where these people were living or that low-cost housing should be built close to places of employment. Shorter travelling distances would also ensure healthier lifestyles as more facilities and opportunities would be accessible to pedestrians and cyclists. The 2011–2030 SDF argues for compact settlements, which can be achieved through strategic infill planning. An urban edge was proposed to achieve

a settlement pattern that is largely based on walking distances. Such an edge, delineated after a thorough public participation process based on densification and integration strategies, could help to solve the problems resulting from sprawl.

To address development in economic opportunity zones, the municipality encourages all formal and informal economic activity to be located within the identified accessible economic opportunity zones, where the municipality will focus investment on public infrastructure to attract the private sector (Mbombela LM 2012). These zones are considered logical investment locations because of the concentration of people and the accessibility of the zones and the fact that they are serviced by public transport.

7.4 The pattern in economy

Planners need to understand the complex systems they work in (see Chapter 2, this volume). The systems approach allows for thorough insight into cities and an understanding of local dynamics. Four main points can be made in respect of complexity in Mbombela:

First, despite planning for integration, the historical context of settlement of black people behind homeland boundaries remains a reality. Many South African cities have townships located just on the other side of the railway line, but Mbombela's townships of Kabokweni and Kanyamazane (see Figure 7.1) are situated 40 km from Nelspruit. This makes spatial integration difficult. Mbombela cannot stop investing in the former homeland areas because large numbers of people live there. But investing in them means that the municipality is reinforcing the spatial patterns of apartheid. Furthermore, the continued long-distance bus subsidy keeps the apartheid planning system intact. This reality is further complicated by the scarcity of land around Nelspruit, which means that prices are high.

Second, the presence of traditional authorities and traditional land practices in these former homeland areas further complicates the above-mentioned problem. Land here is available to low-income households at a fraction of what

it would cost elsewhere. It is therefore not surprising that people remain here, and the growth towards the north is a direct result of this reality. The conflict between the traditional authorities and the municipality exacerbates the situation. Effectively, the municipality is unable to service land managed by the traditional authorities. Access to basic infrastructure remains a problem. Mbombela's current municipal management processes require input from the National House of Traditional Leaders before projects can be implemented.

Third, despite its prosperous economy, Mbombela has some vulnerabilities. Its status as provincial capital is revocable, with calls from the ruling party for a reduction in the number of provinces. Furthermore, global economic trends drive the tourism and retirement industry. This global exposure increases risk.

Fourth, although the implementation of the urban-edge policy is in line with national guidelines, it applies only to the formal urban areas and not to land managed by the traditional authorities. It could in fact encourage urban expansion in the former homeland areas.

7.5 Conclusion

The inevitable ongoing change in cities today makes a rigid approach to planning and policymaking unsuitable. Resilient cities are adaptable and apply flexible approaches and policies to achieve a desired future. Planners must confront and address complex issues, such as the inclusion of traditional authorities in decision-making. This challenge is intensified by the existence of diverse values. A bottom-up approach combined with top-down guidance, which includes all stakeholders in the decision-making process, can influence planning towards a favourable future for all.

Mbombela's economy is growing and it is probably less vulnerable than that of many other secondary cities. It has been boosted by the declaration of Mbombela as capital of Mpumalanga, the establishment of a new airport, the opening of the border with Mozambique, the local and global tourism industry, the retirement industry and the development of a new university. But most of these growth factors come with their own risks. These need to be managed.

Despite the good intentions expressed in policy at all levels of government, Mbombela will probably have to live with the consequences of the apartheid spatial planning for some decades to come.

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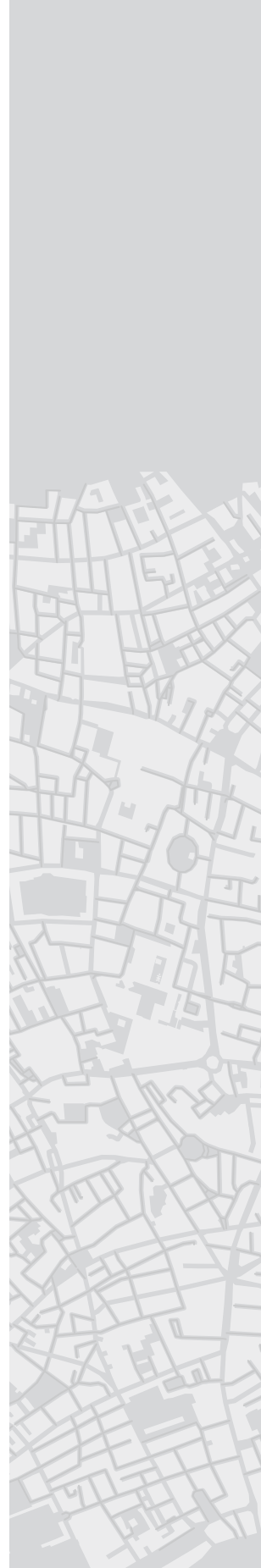
CHAPTER 8

MSUNDUZI: SPATIALLY INTEGRATING KWAZULU-NATAL'S DIVERSE CAPITAL

Thulisile Mphambukeli

8.1 Introduction

Msunduzi LM's main city, Pietermaritzburg, is the capital of KwaZulu-Natal and the municipality's economic hub. The city has benefited historically from its location on the N3 national road linking the port of Durban to Gauteng. It is also well located for the King Shaka International Airport and the Drakensberg resorts. The historical name of the area, and now the name of the district municipality, is umGungundlovu, after the royal capital of the Zulu king, Dingane. Msunduzi is named for its river, familiarly known as the Dusi. The municipality has three distinct areas,



whose history has shaped its spatial and economic structure: the former Pietermaritzburg borough, the greater Edendale district and the Vulindlela tribal area.

Pietermaritzburg was founded in 1838 after the battle of Blood River and served as the capital of the short-lived Voortrekker republic of Natalia. When the British annexed the area, it continued as the capital of the Natal colony, hence the strong British influence in the governance, culture and architecture of the town. It has maintained this status of provincial capital since 1843, despite many changes of power. An incident at the Pietermaritzburg station is reputed to have been the catalyst for Gandhi's non-violent campaign against racism and colonialism. *Edendale* was established in 1851 by Reverend James Allison, a missionary of the Methodist Church. The land was subdivided for freehold occupation by black farmers, although not all the subdivided lots were initially allocated. Under apartheid many of the Zulu inhabitants of the city were forcefully moved to the vacant lots in the Edendale area. Edendale was once prosperous, with freehold villages, but is now a mix of old farmhouses, state-subsidised housing and informal settlements that spill over into the adjacent tribal land. *Vulindlela* is the municipality's westernmost management area. It was previously part of the KwaZulu Bantustan and still falls under traditional authority. In 1990 it was the scene of a bloody battle between supporters of the Inkatha Freedom Party and the United Democratic Movement (a front for the then banned African National Congress) – part of a war for control of the province that raged from 1985 to 1995 and left thousands dead or homeless. Currently, the five areas under traditional authority constitute about 40% of Msunduzi and about 45% of the population live in these areas.

The historical development of the region, as in most of South Africa, has been the outcome of conflicting rationalities, including tribal customs, democratic values and the quest for independence, land and power. The actions of the powerful have often benefited a few at the expense of the majority, a trend which continues today, albeit under a different disguise. The spatial distribution of power permeates complex adaptive systems, with changing

patterns of inclusion or exclusion, access and control. In Msunduzi, power relations have determined who may live where, at what cost, and receive what level of service, and who may benefit from municipal expenditure. For further information on Msunduzi's history and how it has affected the municipality today, see Aitchison (1990), Brown (1993), Epprecht (2016), Ingalls (2017) Kaufman (2017), Msimang (1975) and Watson (2003).

The spatial composition of Msunduzi, with its upmarket suburbs, informal settlements and traditional areas, reflects diverse customs, cultural traditions, socio-economic relations, values and aspirations. Ideally, spatial planning should capture its diversity and build on the hopes and aspirations of the various sectors of the community. However, it is debatable whether the most recent SDF achieves this laudable aim.

The case study of Msunduzi was based on an analysis of municipal documents, such as the IDP and SDF; news reports and other secondary sources; interviews with senior officials (in human settlements, town planning, tourism, financial governance, water and sewerage, and service delivery), an ANC councillor, and the chief executive officer of the Pietermaritzburg Chamber of Commerce; and observations of a sitting of a municipal portfolio committee on 6 June 2017.

8.2 Profile of Msunduzi

8.2.1 Socio-economic

Msunduzi's population grew by 1.2% per annum between 2001 and 2011 and by 2% per annum between 2011 and 2016 and is currently estimated to be at least 670 000 (Msunduzi LM 2016; Stats SA 2012). The average household size increased slightly, from 3.6 in 2011 to 3.8 in 2016, which could be attributed to the increasing number of children (Municipalities of South Africa 2018). The dominant language is isiZulu (71%), followed by English (18.7%), Afrikaans, isiXhosa and Sesotho (1.9%, 1.8% and 1.5%, respectively). Between 2011 and 2016 there was a 2% increase in the proportion of the population with tertiary education, and a larger increase of 7.3% in the proportion who have matric.

8.2.2 Economic

Although the Msunduzi LM has experienced economic growth of between 1.7% and 1.9% since 2011, it still has high levels of unemployment (Msunduzi LM 2017). In 2011, 33% of the population were unemployed and youth unemployment stood at 43.1%. Over 90% of the population earned less than R307 600 per annum, with 32% earning between R9 600 and R38 200 (Stats SA 2012). The dependency ratio increased from 46.4% in 2011 to 54.6% in 2016 (Municipalities of South Africa 2018).

Msunduzi is the economic hub of uMgungundlovu District Municipality. Its main economic sectors are manufacturing and government services, finance, transport and trade (Msunduzi LM 2015). The informal economy operates alongside the formal economy and contributes approximately 12% of the municipality's GDP (Ngqulunga 2012).

Msunduzi's IDP identifies factors that sustain the municipality: Pietermaritzburg's location on the N3, which supports the transport and logistics sector, fertile agricultural land, good schools and tertiary institutions, and the longstanding advantage of being the provincial capital; hence the importance of community and government services to the local economy (Msunduzi LM 2016:17). The city is also an important regional service centre.

Table 8.1 shows the changing structure of Msunduzi's economy and the economic growth rates since 1996. The economy has grown fairly well over the past two decades. Between 2001 and 2011 Msunduzi achieved an average annual growth rate of 3.6% per annum but this dropped to less than 2% per annum thereafter. Sectors that substantially increased their share of the economy between 1996 and 2015 were construction, wholesale and trade, transport and finance. Manufacturing's share declined rapidly, while only a small decline was recorded for government services – largely because of the provincial capital status.

TABLE 8.1 Msunduzi's economy (1996–2015) compared to that of KwaZulu-Natal province, 2010

Sector	Msunduzi's share of the economy (%)				Sectoral share of 2010 KZN economy (%)	Msunduzi's economic growth rate (%)		
	1996	2001	2011	1996		1996–2001	2001–2011	2011–2015
Agriculture	2.9	2.7	2.6	2.6	4	1.2	3.3	1.7
Mining	0.8	0.8	0.5	0.6	1	2.1	-0.4	6.2
Manufacturing	21.9	22.0	18.7	17.5	22	2.7	2.0	0.1
Utilities	6.2	5.6	4.3	3.9	2	0.7	0.9	-0.9
Construction	3.3	3.6	4.1	4.2	3	4.3	4.9	2.5
Wholesale and trade	11.8	13.4	14.1	14.1	14	5.2	4.2	1.8
Transport	7.6	8.5	9.6	9.8	14	5.0	4.8	2.4
Finance	14.2	15.0	18.0	18.3	20	3.8	5.5	2.3
Government services	23.9	20.5	20.5	21.3	13	-0.5	3.6	2.9
Community services	7.4	7.9	7.5	7.7	6	3.9	3.2	2.4
Total	100	100	100	100	100	Average 2.6	Average 3.6	Average 1.8

Source: Quantec (2016)

8.2.3 Services

Table 8.2 shows that the percentage of households with access to basic services has decreased over the past five years. This can be attributed to the population increase and the increase in the number of households, from 164 772 in 2011 to 180 470 in 2016 (Municipalities of South Africa 2018). With the exception of electricity for lighting, Msunduzi has not performed as well as the country as a whole in the provision of basic services (Stats SA 2016). However, service provision is difficult and costly because of Msunduzi's undulating topography, with steep slopes and ravines. This topography

is also partly the reason for the lower densities in the western part of the municipality. The demand for housing is critical in the municipality and the Department of Human Settlements has focused its efforts on assisting people living in informal settlements. Little has been done to deal with the housing problems faced by those living in overcrowded conditions in formal areas. However, social housing has been developed along rapid transit routes

TABLE 8.2 Percentage of households receiving basic services, 2011 and 2016

Service	Msunduzi		South Africa
	2011	2016	2016
Flush toilet connected to sewerage	51.4	49.3	60.6
Weekly refuse removal	53.1	47.4	61.0
Piped water inside dwelling	47.9	41.7	44.4
Electricity for lighting	91.8	96.1	90.3

Source: Municipalities of South Africa (2018); Stats SA (2016)

8.2.4 Governance

Many of the spatial transformation problems in the municipality are closely allied to governance problems, including widespread corruption that has led to the suspension of a number of senior officials and the subsequent appointment of officials on an acting basis. The effect of personnel upheavals has been evident in the inefficiency of service provision, and a high staff turnover has compromised accountability. This situation is one possible reason for the municipality’s inability to spend its budget; almost 65% of its capital budget was unspent in the 2016/2017 financial year. In addition to corruption and uncertainty, internal incapacity to manage the municipality, as well as political interference, have also undermined municipal governance. This is reflected in the worsening audit outcomes, from an unqualified audit in 2014 to a disclaimer of opinion in 2017. Although the 2016/2017 financial year ended with a positive cash balance, other indicators, such as overspending on the operating budget and reduced spending on maintenance, were not as favourable (RSA National Treasury 2018).

One critical issue raised by interviewees was the governance of the Vulindlela region, which falls under traditional leadership. Five *amakhosi* (chiefs) administer the region. They allocate land, and in so doing determine land uses. As Msunduzi's various governance systems are premised on different histories, values and priorities; conflicts over the nature and form of development will affect not only planning but other aspects of municipal governance (such as payment for services). Unless the traditional authorities are part of the planning of the IDP and SDF and fully support these plans, implementing them could be extremely difficult, particularly where parallel governance systems exist (Dubezane & Nel 2016; Williams et al. 2016).

8.3 Spatial transformation

Many of the governance problems mentioned above hamper spatial transformation in Msunduzi. Corruption and political interference, along with failure to spend on critical infrastructure, are holding back the implementation of spatial plans and the integration of this spatially and racially fragmented municipality. Investment tends to be biased towards the more affluent areas, which generate most of the municipality's revenue, rather than the poorest areas that most urgently require basic services. Politicians tend to lobby for investment in their constituencies, leading to disjointed planning and development that is not informed by the IDP or SDF. Furthermore, the need to consult with the *amakhosi* can delay planning or implementation of plans for development in the tribal areas. Moreover, the *amakhosi* may take decisions that are not aligned with the IDP or SDF, for example parcelling out land in wetlands and other environmentally sensitive sites that should be protected.

The distribution of recent spatial growth is spread throughout the municipality but is most concentrated to the south of the greater Edendale area and the eastern fringes of the northern suburbs. The average density is 976 persons per square kilometre (Stats SA n.d.) but, given the mountainous topography, this translates into much higher densities on developable land.

The municipality currently has difficulty controlling new development, from informal settlements to unauthorised student accommodation and industrial activities in residential areas. The existing town planning schemes are inappropriate and must be replaced by a land use management system that is more applicable to the current land use needs. Furthermore, it appears that the municipality's strategic plans are not informed by the needs and opinions of the public. Political interests dominate these plans rather than community consultation. Although there is interaction with some stakeholders, like the Pietermaritzburg Chamber of Commerce, such consultation is restricted to local rather than strategic issues. Nonetheless, interviewees mentioned success with the Vulindlela local area plan where the municipality was active in teaching the community and *amakhosi* about the use and allocation of land that is under tribal authority. It was anticipated that this would help the traditional leaders to understand the spatial trajectory of the SDF and encourage them to contribute their ideas in developing the plan.

Immediate problems, such as the shortage of housing for low-income and unemployed people, amounting to some 190 000 units (Msunduzi LM 2015:39), have prompted a focus on state-subsidised housing. However, much of the developable (surveyed and serviceable) land lies within the upmarket former white areas which provide much of the revenue for the municipality. Thus, development of lower income housing creates a dilemma for the municipality: if mixed-income housing is constructed there could be an exodus of wealthier residents, reducing municipal income and thwarting the goal of social inclusion, yet there are few other areas where large tracts of developable land are available. Consequently, spatial integration, through the development of a mix of housing types which will encourage the integration of income groups, although a policy and planning priority remains on the drawing board. Ten such projects have been identified to create integrated socio-economic areas. One of these is to develop a new compact suburb of 3 000 units about eight kilometres from Pietermaritzburg that will use solar energy for electricity.

Furthermore, the goal of spatial transformation, although endorsed by official plans, has been eroded through personal interests of political and traditional leaders, resulting in development contrary to the SDF. The rigidities of traditional land management and political manipulation of development and the budget are evidenced by the continuation of segregated spatial patterns. The way forward, according to one of the interviewees, is to appoint professionals as administrators and end political interference in the administration. However, the municipality will have to provide an incentive for developers who prefer investing in the wealthier areas to invest in lower income areas as well.

The Edendale Mall was intended to be an investment that would also facilitate transformation of the surrounding area with its range of shops, informal trading stalls and taxi rank. But it has not achieved this. It has poor physical links to the surrounding residential area, particularly for pedestrians. According to one interviewee, the taxi fares to the mall are much the same as to the CBD, which has more to offer; hence the latter is preferred.

8.4 Spatial development framework

8.4.1 Overview

There have been several iterations of the Msunduzi SDF; one in 2002, reviewed in 2009, and a further one in 2015 (Msunduzi LM 2015).

The 2002 plan adopted six guiding principles: compaction, integration, densification, restructuring of the city, identification of areas of economic development potential, and meeting land use needs. These were expanded with the 2009 SDF review to include urban densification, sustainability and creating a good quality urban environment. The compact city principle was defined as “creating a polycentric city, redressing imbalances and integrating the city” (Msunduzi LM 2009:16). In contrast, the 2015 plan adopted seven ‘pillars’: global connectivity, productive systems, ecological infrastructure, sustainable transport, good quality urbanism, social inclusivity and sustainable services (Msunduzi LM 2015:14). Thus, integration and inclusivity have been

a constant thread in the aims of the plans, while sustainability has featured more strongly in later SDFs. The interventions and location of spatial nodes in the 2002 and 2015 plans are similar and were dictated by existing spatial patterns of development and infrastructure.

Although the 2002 and 2009 SDFs were drafted before the SPLUMA was enacted, or the IUDF approved, many of their aims are mentioned in the SDFs. Although some development actions were taken after the 2009 review, it is not clear to what extent that the SDF has been implemented. The 2015 SDF mentions SPLUMA four times, including a few sentences on how the SDF addresses the development principles, and other key policy documents. It does not mention the IUDF. Interviewees said the CoGTA had pointed out that the SDF lacks a comprehensive capital investment framework and is not fully aligned with SPLUMA.

Four main aims can be identified in the 2015 SDF proposals: supporting economic growth and employment, encouraging environmental sustainability, upgrading services and transport, and improving the quality of urban places. The proposals were based on a detailed analysis of the municipality and a growth model was developed which estimated possible population changes and the concomitant social and economic land requirements. These growth models identified a need to provide at least 2 500 ha of industrial land and 600 ha of commercial land, as at present there is not enough serviced land for these purposes. According to interviewees, the intention was to ensure that provision was made for land to accommodate both established and emerging industries and businesses in areas most affected by unemployment. In addition, 9 550 ha of residential land was factored into the plan to provide 355 000 dwellings over the next three decades, most of them freestanding houses (Msunduzi LM 2015).

The need to preserve agricultural land and increase agricultural production features strongly in the SDF. It also considers responses to climate change and suggests a set of actions to mitigate possible bad effects (Msunduzi LM 2015:132). Besides releasing land and supporting agriculture, the SDF proposes strengthening centres of economic activity, including the CBD, and

introducing new nodes, all of which lie in the eastern half of the municipality. It proposes improving connectivity to the N3, as well as the surrounding region, re-evaluating the rail routes and bridging the digital divide. It also proposes protecting the natural resource base and ecological infrastructure and integrating open spaces.

The detailed implementation plan acknowledges that implementation will depend on the municipality's human resource and financial capacity and the nature and extent of the demographic and economic changes that will be involved, all of which could affect the phasing in of the proposed projects. Although over 50 'catalytic' projects are proposed, overall there are seven key programmes, each associated with the main strategies of the plan: launching an agricultural and logistics platform, releasing land for commercial and industrial development, ensuring liveable cities, creating viable urban centres, creating a rapid delivery agency, enhancing the spatial information base of the municipality, and reviving the garden city model (Msunduzi LM 2015).

The *agricultural and logistics* platform and the *land release* programmes are related to economic growth. The *liveable cities* programme is intended to improve the quality of the urban environment in the central areas and in the neglected the southern and western parts that suffer from far lower levels of services and housing. This programme proposes a CBD urban renewal project, an integrated rapid public transport network, an international convention centre and mixed housing opportunities. Linked to the liveable cities programme is the *viable urban centres* programme, which seeks to strengthen lower-order centres that are associated to the transport network to spread social amenities and employment opportunities more evenly. The *garden cities* programme includes refining the ecosystem services plan, creating more public open spaces and restoring the Msunduzi River.

8.4.2 Comment on the contribution of the spatial development framework to spatial transformation

The 2015 SDF was outsourced to service providers who include national and international experts. It is an attractive graphic document with worthy objectives and high aims.

However, when these aims are translated into programmes and projects, the SDF appears to be formulated for a wealthy city, not for one with low levels of services, extensive informal settlements and parallel governance by the *amakhosi*. The statement that “understanding Vulindlela as a suburban and not a rural area is the first step of its successful integration into overall Municipal planning and in providing the needs, services and facilities to ‘complete’ Vulindlela as a liveable settlement” (Msunduzi LM 2015:21) ignores the complexities of the situation. Appreciating the need to protect and enhance ecosystem infrastructure is critical, but so is the provision of water and other basic services throughout the municipality. Much the same can be said for the focus on global connectivity and economic productivity without appreciating that the levels of education and skills available in the local economy are below those required to achieve these aims. The sustainable urban centres project calls for an integrated rapid public transport system, fibre optic networks to enhance connectivity and a city-wide closed-circuit television camera surveillance system to improve safety while reducing crime as key projects, rather than mixed housing and improving the availability and quality of social and economic opportunities in the area, which local residents may consider far more important.

The renewal of the CBD and the integration of communities have been identified as catalytic projects with the objective of creating a symbiotic relationship between retail and socio-economic activities and services that will enable people to access services and employment easily. Thus schools, medical centres and jobs should be strategically positioned to minimise transport time and cost. This is to be achieved in urban nodes and through a public transport and road network that will “enable easy access to the different areas within the city and improve permeability of the city” (Msunduzi LM 2015:153). The SDF also suggests that the CBD urban renewal project should

identify areas for regeneration, create incentives and take the appropriate policy measures to implement the project by finding ways to provide what the businesses want and ensure residents are provided with services that support their livelihoods and well-being. There is, however, inadequate information in the SDF in the form of a capital investment framework for budgeting and scheduling purposes, to enable the inclusion of such projects in the IDP and municipal budget.

Interviewees said that budget allocations have not kept pace with the number of projects that need to be implemented each year. Competing interests for the construction of housing, electricity, water and sanitation services make it difficult to prioritise. Furthermore, the lack of operational funding for planning of projects can delay construction and thus service delivery. While there are infrastructure and housing plans, these are not always aligned and do not support each other, again leading to delays and causing infrastructure grant funding to be returned to the National Treasury.

8.5 Spatial transformation, conflicting rationalities and complexity

In its focus and diagrams, the 2015 SDF visualises the city that it will create as a modern western city, thus overlooking the real complexities facing Msunduzi. It reflects a modernist, perhaps utopian mindset and ideals, an urban fantasy (Watson 2014), rather than the rationalities of customary tribal practices, the daily adversities experienced by impoverished families and the diminished capacity of the municipality as a result of corruption, poor management, high staff turnover and political interference. Such plans appeal to politicians and planners because they portray the desired economic and physical spaces, with order and control, instead of the chaos and informality that actually exist (Bhan 2013; Simone 2004). Such plans both shape aspirations and reveal the decision-makers' reasoning and views of governance, which may differ starkly from those of the diverse communities who live in this city (Massey 2013; Watson 2003). This disconnect has exclusionary consequences, as indicated by the very limited attention given to the tribal and informal settlements in the 2015 SDF (Bhan 2013).

As Chapter 2 of this volume explains, planning amid complexity is far more demanding than a mere technical exercise in a predictable environment. It must contend not only with the complexity of natural ecosystems, but also with that of economies and societies, with their divergent beliefs, motivations and needs. Policymakers may assume that implementing a plan is straightforward, but they often fail to recognise that it is embedded in the complexity of its wider context, in which the various actors each have their own rationalities which may conflict (Cairney 2012).

To compensate for the complexity and diversity of opinion, Boonstra and Boelens (2011) recommended bottom-up approaches to planning, using the ability of complex systems to self-organise – approaches that focus on ‘the process of becoming’. Unlike government-arranged community participation exercises, self-organised social movements are more likely to result in meaningful plans that speak directly to the needs of the city’s residents. They may be messy, with many small plans that make incremental changes, but in a complex system such small changes may have more profound effects on people’s quality of life than a grand plan.

8.6 Conclusion

The most pressing challenges Msunduzi LM faces, as identified by the interviewees and the SDFs, are to rid itself of its governance problems, especially corruption and lack of capacity; to integrate fragmented spaces socio-economically and racially; to encourage economic development in order to reduce unemployment and poverty; and to work towards sustainable development, including development of its natural resources, its water and its productive agricultural land. The 2015 SDF acknowledges the need for these efforts. But its proposals, and particularly its programmes and projects, appear more concerned with improving the quality of spaces than the quality of citizens’ lives.

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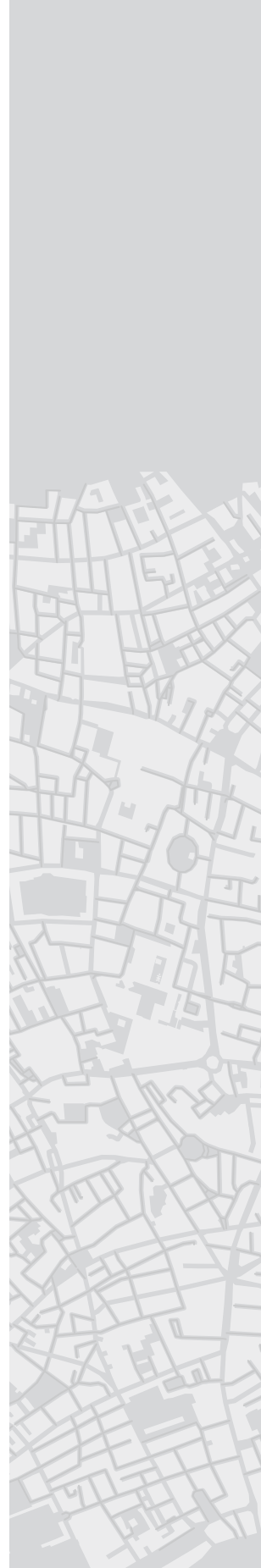
CHAPTER 9

POLOKWANE: A SECONDARY CITY WITH A 2020 VISION

Gemey Abrahams & Lochner Marais

9.1 Introduction

Polokwane LM, part of Capricorn District Municipality, is situated centrally in the Limpopo province. It is Limpopo's administrative capital and its economic hub. The name of its main city, Pietersburg, was formally changed to Polokwane (northern Sotho, 'place of safety') in 2005. This city is located at the intersection of important national and provincial roads providing links to the North West, Gauteng and Mpumalanga provinces and the neighbouring countries of Botswana, Zimbabwe and Mozambique. Today, Polokwane LM consists of the original Pietersburg, now Polokwane City, former Lebowa homeland areas with townships, numerous rural villages under traditional authority and commercial farming land.



Other than Polokwane City and the formal towns of Seshego (to the north-west) and Mankweng (to the east), Polokwane LM remains predominantly rural, with much of the land being under traditional authorities. On the outskirts of the urban areas within traditional areas, are four clusters of settlements: Sebayeng and Dikgale in the north-east, Molepo and Chuene-Maja in the south and Aganang in the north-west. These scattered settlements are home to nearly two-thirds of the population of Polokwane LM.

Polokwane's current spatial pattern is the result of colonial and apartheid planning (Donaldson & Van der Merwe 1998). The white population lived in Pietersburg and the black population in Seshego or Mankweng, resulting in a typical apartheid spatial form. The development of homelands under grand apartheid saw Seshego incorporated into the former homeland of Lebowa (Cloete & Massey 2017), including people who had been forcefully removed from Pietersburg. Seshego acted as a labour reserve for the city of Pietersburg (Donaldson & Van der Merwe 2000). Using border industry policies that provided decentralisation incentives, Pietersburg managed to develop a noteworthy manufacturing industry by the late 1980s (Ntema & Venter 2016). The manufacturing node mainly produces food products for Polokwane's hinterland. Polokwane City received a further economic injection when the city was declared the capital of the Limpopo province. With its strong spatial transportation linkages into the region, Polokwane has benefited from a more prominent role in the region in terms of trade, social and economic services emanating from the economic challenges experienced in Zimbabwe.

Like many other secondary cities discussed in this book, Polokwane LM is faced with the need to deal with the legacy of colonial and apartheid planning systems, which comprise historically differentiated administrative, governance and legal systems, and to reconcile these different land use planning systems, while at the same time positioning itself as a modern place of opportunity in South Africa. It needs to deal with the complexities of redress, different land management systems and a spatially large rural hinterland, while trying to position itself as an attractive location for investment. This chapter shows that

while its planning department has moved forward in preparing the SDF, the other municipal departments pay little attention to the SDF. This is apparently because two decision-making systems in the municipality are working independently when they should be interdependent and using the SDF to guide planning and investment decisions. However, unlike other secondary cities described in this book (for example Mahikeng, Chapter 5), Polokwane shows some evidence of spatial integration as well as social and governance integration across the spectrum of modern urban areas and traditional rural areas comprising small towns and villages.

9.2 Socio-economic profile

9.2.1 Demographics

Polokwane has an estimated population of just over 700 000. The population grew at more than 2.5% per annum between 1996 and 2016. This is higher than the national rate and is an indication of Polokwane's increasing dominance in both the district and the province. It is estimated that just over 400 000 residents (approximately 60%) live on traditional, rural land (Polokwane LM 2017). The number of households in Polokwane has been estimated at 214 464, indicating a steady growth since 1996 (Stats SA 2016). Significantly, the rate of household creation exceeded the population growth rate. Approximately 7 300 new households are being formed each year, all of which must have access to accommodation, basic services and municipal resources (Stats SA 2016).

A study conducted in 2012 found that 95% of the migration into Polokwane City (Pietersburg) was internal, i.e. from other South African provinces, from elsewhere in the Limpopo province, and from other areas of the Polokwane LM. Almost 70% of the migrants came from the rural areas of Polokwane to settle in the city. Polokwane City's location as a transport hub to the northern border countries means that it receives a large number of migrants from Zimbabwe, constituting 95% of all its external migrants, with the remainder coming from Mozambique, Botswana, Swaziland and Malawi. More than

50% of these external migrants move from townships or urban areas in their home countries, 56% move as a result of conflict, land disputes or evictions in their country of origin, and 17% because they have some kind of family tie to Polokwane (Jacobsen & Furst-Nichols 2012).

9.2.2 Economic overview

Table 9.1 shows an overall picture of change. As Polokwane City is the capital city and economic hub of the Limpopo province, finance, government and trade dominate its sectoral contribution to the local economy. Since 2011, the finance sector has been the top contributor to the economy, with government in second position, indicating a strong emphasis on the tertiary sector. Because Polokwane is centrally situated in the province, transport makes an important contribution. The secondary sector (construction and manufacturing) makes a fairly small but significant contribution. The primary sector's contribution has decreased, as mining and agriculture have declined.

Economic growth has been uneven. All sectors of the economy grew between 1996 and 2015, and above average growth was experienced in agriculture, construction, transport and government services. The strong growth in construction is indirectly related to the capital status as it contributed to large land expansion in Polokwane. The growth in trade is a result of the capital status but also a consequence of a large number of Zimbabweans using Polokwane as a trading centre.

The number of people who are employed in Polokwane has more than doubled, from 71 000 in 1996 to 156 000 in 2011 (Stats SA 1996, 2001, 2011). Household income increased more than the consumer price index at 9.6% per annum (consumer prize index is 5.9% per annum) between 2001 and 2011 (Stats SA 2011). The dependency rate decreased from 61% to 54% for the same period (Stats SA 2011).

TABLE 9.1 Economic contribution and growth by sector in Polokwane, 1996–2015

Sector	Polokwane's share of the economy (%)				Annual growth per sector in Polokwane (%)				
	1996	2001	2011	2015	1996-2001	2001-2011	2011-2015	1996-2015	2001-2015
Agriculture	0.7	0.8	0.9	0.9	7.0	5.5	1.8	5.1	4.4
Mining	0.7	1.2	0.7	0.6	17.5	-1.1	-4.0	2.9	-1.9
Manufacturing	3.8	3.7	3.7	3.6	3.5	4.2	1.3	3.4	3.4
Utilities	3.7	3.4	3.6	3.3	2.8	4.9	-0.7	3.1	3.3
Construction	4.1	3.5	4.5	4.7	1.1	6.9	2.9	4.5	5.8
Trade	21.3	23.0	21.3	21.2	5.9	3.5	1.8	3.8	3.0
Transport	4.0	6.1	6.9	7.1	13.4	5.6	2.4	6.9	4.7
Finance	34.1	28.7	29.3	28.9	0.8	4.5	1.5	2.9	3.6
Government services	22.5	24.4	24.3	25.0	5.9	4.2	2.6	4.3	3.8
Community services	5.1	5.1	4.7	4.8	4.4	3.4	2.4	3.4	3.1
Total/Average	100	100	100	100	4.3	4.3	1.9	3.8	3.6

Source: Quantec data (2016)

Note: The average economic growth rate in the bottom row is calculated from the total GVA figures and is not an average of the figures in the columns above.

9.2.3 Municipal finance

Municipal revenue was R2.8 billion in the 2016/2017 financial year (Polokwane LM 2018). Polokwane was able to spend R573 million on capital investment and its capital budget has also increased since the 2011/2012 financial year. Nearly 50% of this capital budget comes from own generated sources. Property tax contributes just over 10% of own generated income. Expenditure on maintenance and repairs comprises more than 7% of expenditure. This is higher than the norm of about 5% and could mean the municipality has a good cash flow.

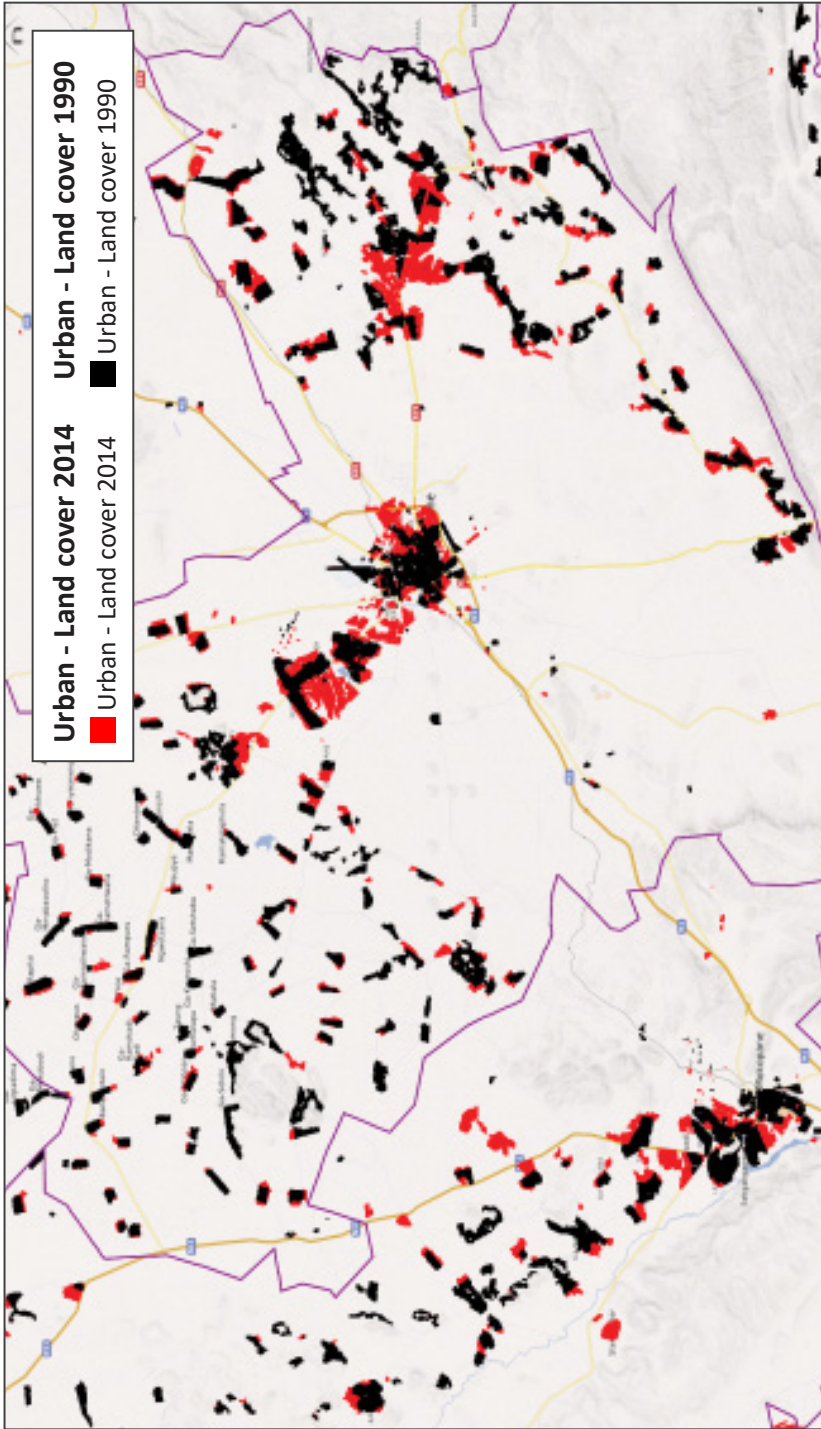
9.2.4 Municipal infrastructure

Table 9.2 shows some noteworthy trends. Rapid progress has been made in providing electricity, waterborne sanitation and formal housing over the past 20 years. The growth in the percentage of households with indoor water has been somewhat slower. The slow progress in water provision is the result of the dispersed settlement system (further detail is provided in the next section). At the same time, the decline in the percentage of informal structures is the result of the housing subsidy programme, which could have resulted in further urban sprawl, although a high degree of infilling has also been reported for the apartheid buffer strip between Seshego and the old Pietersburg (Cloete & Massey 2017).

TABLE 9.2 Household access to municipal services in Polokwane, 1996–2016

Indicator	1996	2001	2011	2016
Total number of households	85 373	124 978	178 001	214 464
Number of households with indoor water	25 127	24 022	59 998	62 593
Percentage of households with indoor water	29.4	19.2	33.7	29.2
Number of households with flush toilet	23 263	40 890	78 509	103 400
Percentage of households with flush toilet	27.2	32.7	44.1	48.2
Number of households with electricity	36 414	79 527	147 710	201 583
Percentage of households with electricity	42.7	63.6	83.0	94.0
Number of households living in informal structures	10 447	19 476	16 044	11 231
Percentage of households living in informal structures	12.2	15.6	9.0	5.2

Source: Stats SA (1996, 2011, 2016)



Source: Author, Mapable - based on SANBI data (2014)

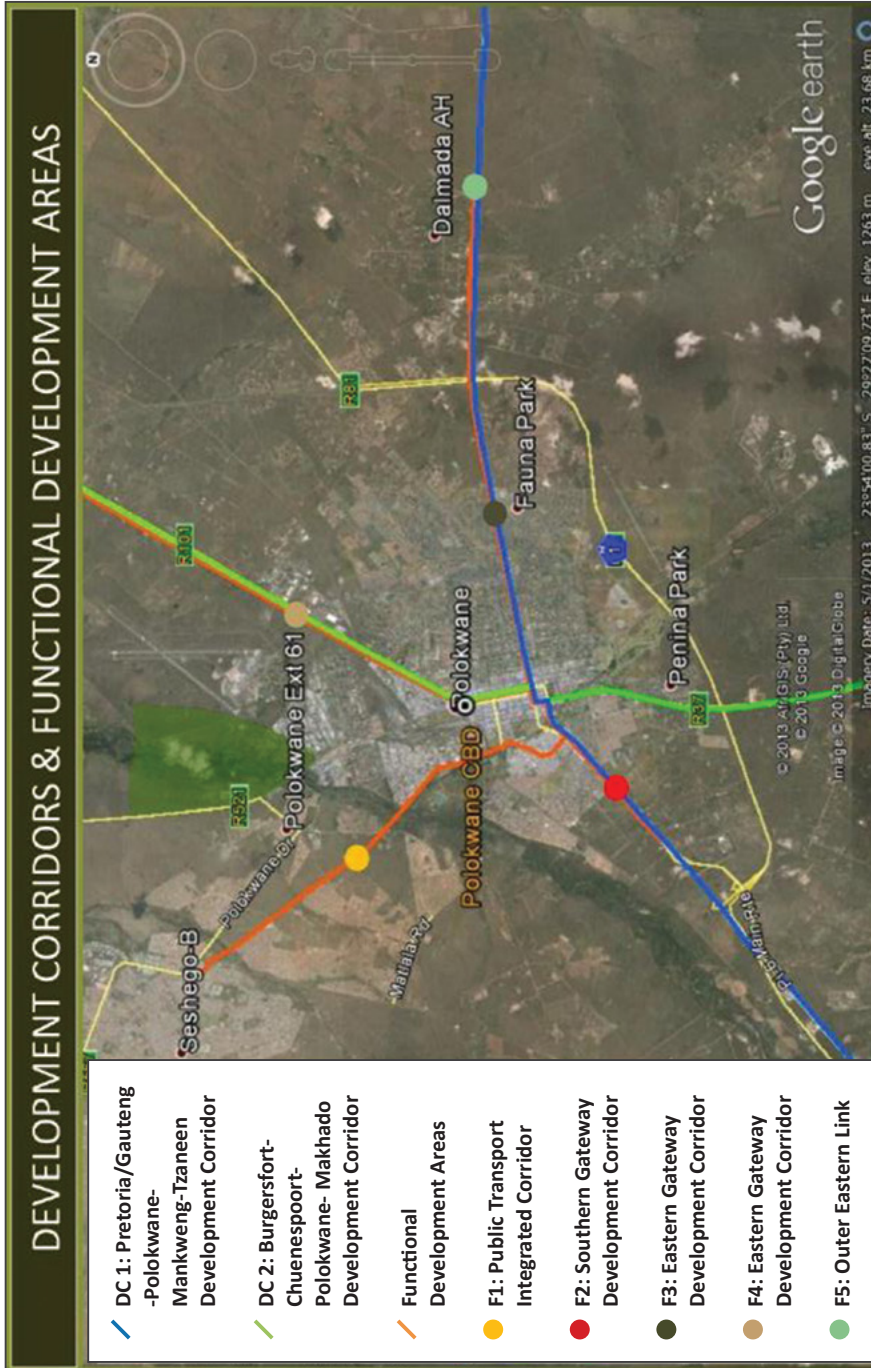
FIGURE 9.1 Polokwane Municipal Area – Increase in Land Cover, 1996–2014

Figure 9.1 shows that between 1990 and 2014 the proportion of settled land expanded by 35%. The population increased by 45% between 1996 and 2011 (Stats SA 2011). These figures indicate both urban sprawl and higher densities. Growth in the three main urban concentrations indicates increasing urbanisation of these centres. However, the noticeable trend of growth around existing villages on traditional land along transport routes to the northwest of the city indicates urbanisation occurring on rural, traditional land in locations within reach of the amenities of urban living, fuelling sprawl and spatial diseconomies, as illustrated in the land cover map (Figure 9.1).

9.3 Factors affecting spatial change in Polokwane Local Municipality

9.3.1 Settlement hierarchy

Polokwane Local Municipality covers an area of 377,579 ha. It contains large tracts of rural commercial farm land, rural traditional land with rural homesteads, small villages and village clusters, and the city of Polokwane, the town of Seshego and some small but growing towns such as Mankweng. Given this diversity of settlements, Polokwane has used Limpopo province's concept of a hierarchy of settlements to direct its spatial planning. The first-order settlements are the bigger urban areas, which the province classifies as 'growth points'. Polokwane has three types of growth points: provincial, district and local. These are Polokwane City (including Seshego), Mankweng and the Sebayeng-Dikgale cluster, respectively. Smaller villages in rural areas are called 'population concentration points' and the final category is 'isolated villages'. The municipality determines the level of development and the scale of the facilities to be provided on the basis of these categories. To manage this diversity and spatially dispersed form, it has adopted a spatial concentration model in urban areas and a selective cluster model in rural areas rather than a dispersion or concentration model. This directs growth to the premier node of Polokwane-Seshego and other identified nodes to address urbanisation pressures, while also including more social interventions in the rural areas.



Source: Polokwane LM (2014)

FIGURE 9.2 Corridors in Polokwane

9.3.2 Corridors and transportation

Polokwane City is the municipality's hub, with roads radiating out from it in several directions like the spokes of a wheel. This offers considerable development opportunities to capitalise on this central location and facilitates the spatial links between the settlements or nodes. The municipality has adopted the concept of corridor development along the main routes, identifying corridors of varying scales, depending on the order of road that links the areas (see Figure 9.2). Two of the corridors are national spatial development initiative corridors: Development Corridor 1 (Pretoria/Gauteng – Polokwane City – Mankweng – Tzaneen) and Development Corridor 2 (Burgersfort/Chuenespoort – Polokwane – Makhade). These support regional connectivity. Other corridors have been identified to provide local connectivity and integrate the smaller towns and settlements with Polokwane City: the Public Transport Integrated Corridor (F1); the Southern Gateway Development Corridor (F2), which is seen as successful and attracting much development; the Eastern Gateway Development Corridor (F3); the Northern Gateway Development Corridor (F4), to link the city with the airport; and the Outer Eastern Link (F5).

As far back as 2007, the national government approved the operational plan for an integrated rapid transit system for Polokwane (Polokwane LM 2014:36). Much of the motivation for this was to integrate the outlying Seshego, Moletji and Mankweng with Polokwane City to make transport more affordable to residents commuting these distances. The system has been named *Leeto la Polokwane* ('The journey of Polokwane') and is to be constructed in phases. The first phase, consisting of road improvements, including cycle lanes and bus bays, is currently being implemented.

9.3.3 Traditional land

Up to 70% of the land in Polokwane is under traditional authorities. Such land is not easily incorporated into urban areas. The land development processes differ from those in the (former white) urban areas, creating spatial, administrative and institutional fragmentation. The traditional areas

fall outside the municipality's rating system. Where services are provided by the municipality, they are free (at the basic level). Parts of the traditional areas closer to urban nodes are becoming densely settled and urbanised, putting pressure on the municipality to plan and improve services. This is a phenomenon experienced in several secondary cities across South Africa.

9.3.4 Water and sanitation infrastructure

In 2013, the municipality declared a moratorium on new development because of the lack of water and sanitation service capacity. According to the executive mayor, this has had a detrimental effect on economic development as many development companies and professional consultants consequently ceased to operate in the city. This statement was corroborated in discussions with private developers. Officials from the planning and finance departments also expressed concern and noted that municipal revenue had likewise decreased. The need for a serious intervention, such as a moratorium, indicates a possible weakness in the integration of spatial planning, infrastructure and finance, including integrated longer-term planning. The municipality had been aware of the looming problem for several years and had sought assistance from other spheres of government to increase water supply and upgrade sanitation. Within the city itself and in Seshego (Polokwane LM 2017:125), water losses currently run as high as 48%. Longer-term water solutions require R1,5 billion to provide a sustainable supply (Polokwane LM 2014:107). Likewise, for sanitation, a long-term solution in the form of a regional sanitation plant is required and just over R750 million has been allocated to this over the following three years. The municipal officials said the moratorium has now been lifted and development applications are again being accepted because it is anticipated that in three years' time (the time it takes from the submission of an application to soil being turned on site) the water situation should ease. The municipality's vision of a capital city and future metropolitan municipality may be at risk if sustainable and affordable water solutions are not found. Reliance on more boreholes and on national and provincial grant funding could put the City of Polokwane's future growth at risk.

9.4 Spatial development framework

The Polokwane SDF was prepared in 2009/2010 and finally approved by the council in 2012. The previous SDF had been approved in 2007. Even then, the municipality's SDFs were informed by the principles of the Development Facilitation Act of 1995. The 2010 SDF, therefore, predates the NDP of 2012, the SPLUMA of 2013 and the IUDF of 2014. This, notwithstanding, the SDF does acknowledge and build on principles similar to those of SPLUMA and the IUDF, including principles to promote more compact development, integrating spatial development with infrastructure delivery and capital budgets, mixed land uses, especially along transit corridors and sustainable human settlements.

The 2010 SDF proposes three planning components. The first component is a high-level or macro-SDF for Polokwane LM as a whole. This component proposes the overarching spatial conceptual approach for the municipality and provides a spatial vision, principles, guidelines and objectives. The spatial vision springs from the reality of the high levels of poverty and the modest ability of the municipality to address all needs, and it acknowledges national spatial principles and the need to support local potential. Its aim is to "enhance sustainable development and alleviate poverty by focusing scarce resources on areas with economic growth potential and the highest return on capital" (Polokwane LM 2010:161). Its objectives are to

- guide growth in a sustainable way in line with development principles;
- promote economic growth and address unemployment;
- promote investment opportunities through industrial development;
- promote sustainable human settlements by integrating them through improved public transport (bus rapid transit) and road networks in a spatially responsible manner;
- promote infrastructure investment in priority areas;

- open up strategic land for economic development and attracting investors;
- protect and preserve sensitive environmental areas; and
- promote guidelines for the integration of areas (Polokwane LM 2010:161).

The second component proposes the development of local SDFs for the three urban nodes of Polokwane City (including Seshego), Mankweng and the Sebayeng-Dikgale cluster. These local SDFs are at the conceptual level, but they indicate the urban edges, corridors, road hierarchies, nodes and key land issues. Some of the principles underlying this component are to support the capital city; promote sustainable development; promote compact city development principles, urban integration and infilling; promote mixed land uses along intra-urban links and mixed-use corridors and nodes to reduce travel time; create good quality urban environments; and create a functional open space system (Polokwane LM 2010:202). An urban edge is defined, and a guideline stipulates that 90% of the urban area within the edge should be developed before any development is permitted outside it, in the fringes (Polokwane LM 2010:203). Corridors and activity spines are identified (Polokwane LM 2010:204), along with a guideline for the types of land use suitable for each of the corridors and the densities to be promoted along them. In general, these guidelines promote mixed uses, offices, business parks, high-tech industries, sports facilities and higher-density residential developments. The guidelines also promote nodal development with a hierarchy of nodes, consolidation of existing nodes, the identification of gateway nodes at strategic locations and other specific-use nodes such as the medical node, the sports node and an administrative node in the southern CBD where most of the government buildings are located (Polokwane LM 2010:213).

This high-level SDF for the Polokwane City area therefore provides a spatial structure for the city and gives high-level guidance, based on relevant spatial development principles, regarding where to locate desirable land uses. The SDFs for the two smaller urban areas, Mankweng and the Sebayeng-Dikgale cluster, are informed by the idea of integrating these settlement clusters into

urban systems. This is to be achieved largely through transport links and local economic development, along corridors close to existing urban concentrations and by capitalising on the comparative advantages those areas have to offer. The aim appears to be to develop outwards from the small centres and from Polokwane City, with a further aim of merging these urban areas in future. This local SDF does not, however, give a clear sense of the role of these towns, their envisaged future shape and role, their projected contribution to spatial transformation and the long-term development goals of the municipality. This should be a future consideration for Polokwane municipality and other secondary cities with multiple urban centres and planning should consider local and wider economic and social roles of the smaller nodes in relation to the larger centre and not compete directly.

The third component focuses on rural areas. The spatial development approach for these areas differs quite markedly from the approach for the urban areas and it acknowledges that these areas are experiencing out-migration to more economically developed areas. The approach is therefore to focus on people (for example by providing grants and promoting social upliftment) rather than the place as such, as embodied in the National Spatial Development Perspective (now superseded) (Polokwane LM 2010:226). In sum, the spatial plan for Polokwane's urban areas is to support development inside urban boundaries, promote infill, attract development to a hierarchy of nodes, concentrate new development along identified corridors and create links between urban settlements that are close together (such as Polokwane and Seshego). For the rural areas, the aim is to invest in people rather than places.

9.5 Assessment of the spatial development framework

The study of secondary cities in this book saw the assessment of spatial transformation as a major component and the methodology was to provide a set of templates and questions as a guide while reviewing documentation and undertaking interviews. The focus was on the quality of the planning process, the quality of the plan and the degree of implementation. This section assesses the SDF.

The 2010 SDF is a comprehensive report with competent maps prepared by the planning department's GIS section and it appears to have good alignment with national and provincial principles and policies of the time. When it was prepared, the municipality needed additional professional capacity and appointed external consultants, Rian Beukes Town and Regional Planners and Property Consultants. The consultants were familiar with the Polokwane area and the local consultant was a former local municipal planning official. The municipal officials said the municipality will most likely once again outsource the updating of SDF. The municipality has improved its GIS capacity and can prepare its own maps for the SDF.

The SDF was prepared with public consultation and workshops were held with stakeholders. Some internal departments were also consulted and their plans (for example the water services plan, the transport master plan and various environmental plans) were incorporated. However, in discussions with other internal departments, it was apparent that these departments had neither extensively participated nor internalised the SDF in their planning processes. The departments obviously still operate and plan independently. It would be fair to say that there is a growing awareness among all stakeholders of the importance of the SDF since the introduction of SPLUMA. Indications are that a future SDF will assume a more central role in the planning of internal departments in the municipality, especially for technical services, economic development and finance.

The SDF does take into account district, provincial and national planning policies, including the Limpopo SDF, which includes the provincial spatial rationale. In its assessment of the IDP (Polokwane LM 2017), the CoGTA made the following comments:

- The municipality reflects on the legacy of apartheid planning. However, there is no clear strategy on how to reverse that. There is no appreciation of the proposed IUDF interventions to achieve spatial transformation.

- There is a land use scheme in place. However, it essentially covers the CBD and Seshego. Given the fact that 70% of the area is rural, how is the municipality dealing with the land use scheme in the rural context?
- The IDP does not clearly articulate the spatial correlation between environmental issues, development activities and patterns. Alignment of environmental plans or strategies with the other spatial plans is not visible.
- The relationship between the spatial plan and the economic development plan (and so also the tourism plan) is not clear.
- There is insufficient information on how the municipality is planning to build on the opportunity for a logistics hub.
- There is no articulation of strategic infrastructure initiatives that will stimulate the local economy.
- There is no plan to address land claims.

The municipality's spatial planning directorate appears to have a good relationship with most of the traditional leaders of the surrounding areas and this relationship is being solidified through ongoing engagement in SPLUMA implementation meetings. Among the aims of the meetings are to clarify the roles of traditional leaders and municipalities in terms of SPLUMA, including functions such as land use management, decision-making structures to decide on development applications and wall-to-wall land use schemes. There is a growing appreciation at the municipality of the need to plan in denser areas under traditional leadership. However, the fact that the traditional areas pay Eskom (the South African electricity utility) rather than the municipality for electricity and are exempted from paying municipal rates and service charges, means that they have different systems in operation, which underscores the fact that spatial integration must be linked to institutional and administrative integration.

The SDF approach of preparing a macro plan for the entire area and then local plans for the urban areas was intended to guide development coherently in the urban areas that are under pressure, within an overall framework for the municipality. However, being the first SDF to incorporate local SDFs, the SDF is by nature conceptual and tends to reflect what currently exists, rather than make any bold statements about the future, offer a longer-term spatial vision of the area or describe in detail actual sites where future development must be encouraged. However, the SDF does acknowledge that more data and information are required for more detailed local SDFs. The local SDFs are based on sound planning principles. They are intended to achieve spatial integration and they use planning instruments to achieve these objectives, even though in a largely theoretical manner.

The current SDF is only partially SPLUMA compliant, mostly because of the overlap between the principles of SPLUMA, the Development Facilitation Act and the existing Municipal Systems Act requirements for an SDF. An improved SDF will have to consider a single plan with a long-term spatial vision, account for the spatial implications of demographic, economic and human settlement trends, assess the environmental pressures, identify areas where shortened development procedures can apply, focus on alignment and integration of sectoral policies, provide a capital expenditure framework, give guidance in respect of a land use management scheme and include an implementation plan.

In sum, the main observations made here are that the SDF 2010 is not sufficiently strategic, not integrated with the planning of other departments and not linked to the budgets for capital projects. The major underlying problem is that it is not accompanied by an implementation plan and so the necessary trade-offs, given the limited resources and how they will influence the planning of other sectors, are not evident.

The municipality is, however, making progress with its other strategic goals. Polokwane City has become largely racially integrated (Donaldson & Kotze 2006), backlogs for housing are not excessive and the moratorium on new development because of water and sanitation inadequacy has been lifted.

Financial compliance with all reporting protocols from National Treasury has improved. The municipality has increased its support to indigent residents and most of the traditional areas are seen as 'social' areas in which the municipality provides free basic services and other welfare support.

The SDF acknowledges the planning difficulties on traditional land. The municipality's planning department does not consider these to be insurmountable because there are processes and legal procedures for the acquisition of land for urban development in traditional areas. Improved cooperation and consultation will see the municipality assisting traditional leaders to plan such areas without this constituting a threat to their traditional land administration and allocation functions.

Although the SDF supports higher densities in urban areas and includes a densification strategy, these are still considered relatively low densities by metropolitan or global standards. (Polokwane's maximum densities are 74 or 75 dwelling units per hectare along corridors and the inner city.) Traditional areas are designated to be developed to densities of 44 units per hectare, compared to 31 units per hectare in the suburbs.

Discussions with municipal officials in the planning department and external consultants revealed that, generally, the municipality has some difficulties in implementing the SDF. The reasons for this include a lack of capacity, slow decision-making, poor land use regulation, changes brought about by the introduction of SPLUMA, and developments being driven by either politics or private developers who do not adhere to the plans. The 2010 SDF does not include an implementation plan, which makes it difficult to assess implementation against dates or project implementation time frames. There is no monitoring of the SDF or its implementation. None of the officials interviewed in departments other than the planning department, said they had had to report on how their policies, plans or projects complied with the SDF. The SDF does not appear to influence how other departments plan, nor does it appear to direct private sector investments in the municipality. Moreover, officials in the planning department said it is generally difficult to implement the SDF.

Notwithstanding these difficulties, it is apparent that some aspects of the SDF are being implemented and can be considered successful. The increasing densification and development of mixed land uses along the corridor between Polokwane and Seshego are in alignment with the plans. Similarly, in line with the SDF, development is occurring on the edges of Polokwane City towards Mankweng.

Polokwane has been relatively successful in directing development along key corridors, especially in the area between Seshego and Polokwane. It has also, to some extent, directed the infilling and consolidation of the Mankweng node. However, it has not been very successful in achieving spatial integration of residential areas. Most growth in this respect has been either through peripheral, gated townhouse developments for the middle- to upper-income groups or inner-city densification through uncontrolled and unplanned population increase and building densification as poorer people and students have crowded into existing buildings to be closer to the opportunities provided by city living.

Before any strong claims of spatial transformation can be made, more explicit spatial interventions are needed in Polokwane for more integrated residential development where lower-income residents can be provided with affordable and accessible shelters and improved access to work opportunities. The new inner city plan may go some way to address this in the future.

Discussions with the city manager pointed to the need for an explicit, longer-term spatially-focused city development strategy to direct investment and to achieve a more compact, efficient city that will lead to accelerated economic growth in the municipality (Interview, Mr Dikgape Makobe, city manager, 27 June 2017). This is an indication that the current SDF is not considered the instrument to achieve this. For effective spatial transformation, the preparation of the new SDF will have to be done differently. It must be a collaborative venture with other departments so that more integrated planning and budgeting can be done and, more importantly, so that the SDF gains wide acceptance within the municipality and all departments commit to the same spatial vision, so that the combined resources and budgets are

targeted to identified and agreed areas or priority or special zones. Business, state-owned enterprises, and provincial and national departments must all participate in the preparation and implementation so that the SDF will show where all these parties intend investing within the municipality. The outcome must be an SDF that not only has buy-in but will also shape and direct the capital investment framework required by SPLUMA, so that capital investment for social and other infrastructure is correctly targeted to priority development areas. It must also have an implementation plan with time frames, indicators and clear responsibilities.

9.6 Conclusion

The spatial form of the Polokwane LM has by and large been determined by its colonial and apartheid origins and the post-1994 amalgamation and demarcation of local government areas. The current spatial form of the municipality is that of a primary urban node, two smaller urban centres and several dispersed rural villages and settlements. It is a municipality that must at the same time provide for a large, dispersed rural community as well as an increase in urbanisation in and around its relatively small urban centres, all within the context of limited infrastructure investment and financial resources. To accommodate this spatial form, which is also common in other secondary cities, the SDF has focused on spatial transformation of urban areas through compaction, urban edges, corridor development and mixed uses, while directing more social development towards rural and traditional areas. This growth includes increased, largely unplanned, densification of the traditional areas close to the urban centres and along some of the development corridors.

Its location at the nexus of several important regional and international road corridors, together with its capital status, has influenced its spatial form and will continue to do so.

The municipality has an SDF that is informed by sound spatial planning principles that aim to achieve more compact, integrated forms of spatial development by concentrating development along identified corridors

and selected nodes. These theoretical spatial concepts are all adequately articulated in the SDF and in the local SDFs. However, wide commitment to this SDF is lacking and, to date, it has not succeeded in achieving its stated objectives. It is also not in line with new government policies and Acts such as the IUDF and SPLUMA.

The municipality has not been successful in implementing the SDF. Possible reasons for this include limited planning and administrative capacity, some departments not doing their planning in terms of the SDF, the absence of an SDF implementation plan, political and economic development imperatives that support developments that may not be in line with the SDF, the downturn in the economy in recent years, low infrastructure maintenance and technical capacity, and the development moratorium because of water and sanitation inadequacy.

Nevertheless, the self-organising capacity of a complex system has been revealed in the spontaneous densification of certain areas and the emergent development along proposed corridors. Herein lies an opportunity to use the existing dynamics of the system to accelerate the implementation of spatial proposals. To do this, the municipality's limited capital budgets for key developments must increasingly be focused on leveraging the desired development instead of being captured by development led largely by the private sector.

In addition, cooperative planning is required between the municipal officials and traditional leaders to effectively regulate residential growth in the traditional areas. Unless the two systems cooperate, the disjuncture between good intentions for spatial transformation contained in plans and the actual spatial location of new development will continue.

However, the municipality has many advantages that provide opportunities for spatial transformation. The functionality of its CBD and the absence of a strong decentralisation trend make it an attractive option for denser, mixed-class residential development. It has municipal-owned vacant land suitable for infill, much of it in good locations. It has its development corridors. And it has

strong growth in the tertiary sector. These are all factors on which Polokwane can capitalise. To do so, it needs to target its spatial interventions with a well-supported SDF, aligned with the IUDF and SPLUMA, and linked to a longer-term city development strategy with a clear spatial vision, articulated spatial outcomes that can be measured, a capital expenditure framework linking investment and space and an implementation plan.

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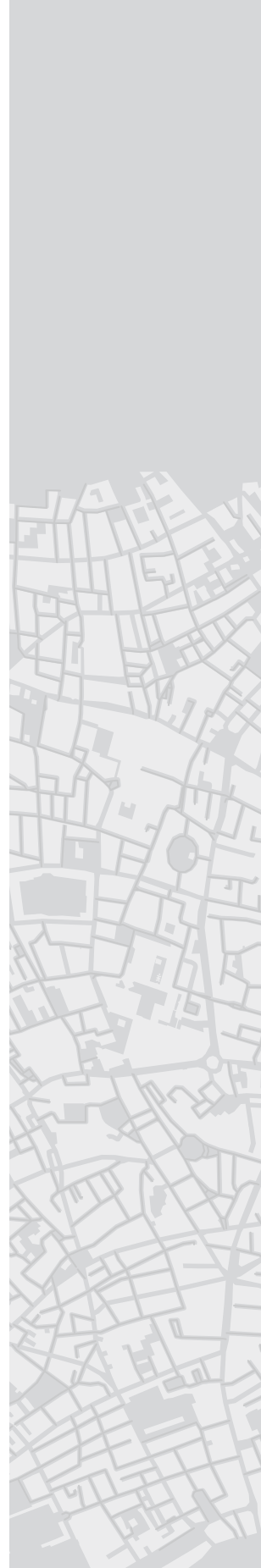
CHAPTER 10

RUSTENBURG: BOOM AND BUST IN A MINING TOWN

John Ntema

10.1 Introduction

Since the mid-20th century, mining has dominated South Africa's economy and particularly the local economies of its mining towns. The city of Rustenburg in the North West Province's Platinum Belt, about 100 km west of Pretoria, is the site of the world's biggest platinum mine that produces half of the world's platinum. During the 19th century it was a small town serving as a rest and refreshment station for prospectors travelling between the Kimberley diamond fields and the Witwatersrand gold mines. Later it became a regional administrative hub for marketing agricultural products and a centre for the surrounding farming community to socialise and attend church. Platinum mining began in 1929. Today, Rustenburg is a major urban centre, serving as the economic hub of the entire province. Its meteoric growth was directly



related to the worldwide use of platinum in the automotive industry. However, the city now faces the threat of mine decline or closure because of the global oversupply of platinum and because the open-cast platinum mining practised elsewhere is a cheaper process than Rustenburg's underground mining. There is thus a very real risk that the city will lose its economic viability.

Over the past two decades Rustenburg LM has experienced both economic transformation and a continual population influx, factors that have changed the city's settlement patterns. Other factors that have had large-scale spatial implications for this city have been the changes in the housing policies of both the government and the mining companies and the changes in labour regimes.

This chapter looks at the implications of the boom and bust situation for this mining town and the way post-apartheid policy and the municipality's limited institutional capacity are likely to affect the spatial transformation intended to redress past spatial inequalities. It considers the complexity and interdependency of the factors that affect spatial change here. The local municipality seems ill-equipped to manage these complications appropriately. Rustenburg, like other South African mining towns (Marais, 2013a; Marais, 2013b; Marais and Nel, 2016; Marais et al. 2017), also suffers from the disruption of strikes and union demands, and most notably and disastrously, it suffered from the Marikana Massacre of 2012. The events also led to significant focus on, and investments in the process of municipal spatial transformation.

10.2 From farming centre to platinum city

The development of Rustenburg can be understood by looking at its pre-1994 history. Governance and planning were rooted in the colonial and apartheid systems. Rustenburg ('town of rest') was founded on 22 January 1850. It was named by the Voortrekker leader, Andries Pretorius, as an expression of his desire to find not only a resting place but also a place to settle permanently. In 1918, the colonial government granted Rustenburg municipal status. Besides being an administrative centre, it also became an important agricultural centre, producing tobacco, groundnuts, maize, wheat and cattle. As a regional

service centre, the town attracted Indian traders. The area is home to one of the largest African tribes, the Bafokeng. Colonial planning led to blacks and Indians being resettled in Rustenburg in the 1920s. The first black township was Tlhabane, and Ziniaville and Karlien were the first townships for Indians and coloureds, respectively. For the 'white' Rustenburg of those days, the black township had economic significance as a labour reservoir. The ever-growing population of Tlhabane further prompted the establishment in the 1960s of two more black townships, Boitekong and Phokeng. In 1977, the apartheid government incorporated Tlhabane and Phokeng into the Bophuthatswana 'homeland'. Shortly after the 1994 elections, the post-apartheid government reincorporated the various townships and villages – formerly under Bophuthatswana rule – into South Africa. Rustenburg today retains spatial elements of meso-apartheid (segregation of residential areas) and grand apartheid (the homelands policy).

The boom in the platinum industry brought fundamental changes to Rustenburg. From the early 1990s, agriculture's share of employment declined and that of mining increased. The change can be seen in the decline in the number of people living on commercial farms in the area, from 11 168 in 2011 to 4 063 in 2016 (Stats SA 2012, 2016). Mining came to dominate Rustenburg's economy, with 59% of its GVA originating from mining. In consequence, between 1996 and 2016 Rustenburg's population doubled, reaching nearly 630 000 (Stats SA 2016). This being despite a slight decline in the economic contribution of mining from 68.2% in 1996 to 59.5% in 2015 with the subsequent reduction in the work force of Anglo American Platinum from 88 300 to 51 000 between 2007 and 2012 and a further retrenchment of about 7000 and 9000 by Lonmin in 2009 and 2011 respectively (Ojakorotu et al. 2015).

Today, Rustenburg is one of Africa's fastest-growing cities, second only to Cairo. It is host to the Royal Bafokeng Nation, the ethnic homeland of the Bafokeng people, the richest tribe in Africa. The Rustenburg local municipality has the seventh largest city economy in South Africa, even larger than those of two of the metropolitan areas, Buffalo City and Mangaung Metropolitan Municipality

(SACN 2012). It is the North West Province's largest local municipality and has the largest GVA in that province. For more on the history and development of Rustenburg, see Bezuidenhout and Buhlungu (2015), Geldenhuys (2015) and Morton (2008).

10.3 Spatial planning problems in Rustenburg

Despite the implementation of various policies and programmes for transformation, South African cities, Rustenburg included, nevertheless remain spatially skewed (Harrison & Todes 2015). Three main trends affect spatial development in Rustenburg: urban sprawl (caused by continued racial segregation and an increase in the informal settlements scattered around the mines), unintegrated infrastructure, and the change in policy for mineworker housing, along with changing labour regimes and mineworkers' responses to these changes.

Figure 10.1 shows the increase in land cover in Rustenburg over 15 years. One reason for this sprawl is continued racial segregation and another is the uncontrolled development of informal settlements inside and outside the urban edge. Between 1990 and 2014, the area of densely settled land in Rustenburg increased by 35%. This is much less than the more than 100% increase in population over the same period, but despite some areas of higher density there is also considerable low-density sprawl. Some of the sprawl is on land close to the mines, including some on traditional land either belonging to or managed by tribal authorities. Interviewees referred to what they called 'frog-jump' development, which has resulted in scattered settlements close to the mines. Hence, 31.5% of the total population in Rustenburg are currently living in spatially segregated and peripheral informal settlements (Rustenburg LM 2016a). While the city has experienced annual population growth rates of more than 3% since 1996, the number of households has grown even faster.

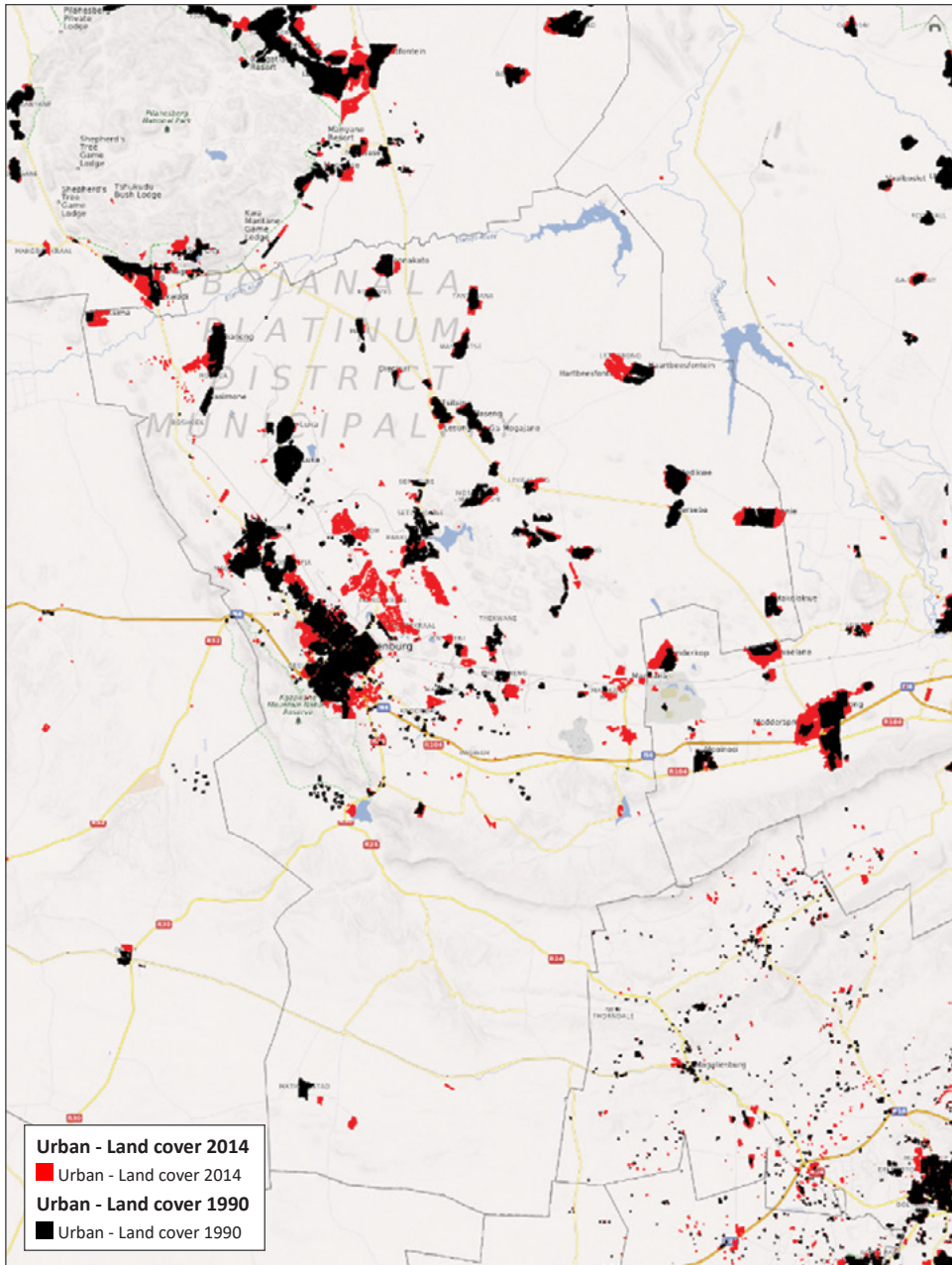
As outlined in the paragraph above, land development in tribal authority areas and government human settlement development investment also play a role. What is of relevance is that the municipality and municipal plans seem to have limited influence on any of these or on informal settlements. The challenge

related to 'parachuting' of national projects into local integrated plans within the area has been identified in the Spatial Alignment Review study by Pieterse et al. (2016), conducted for SACN and COGTA.

The current lack of racial integration, coupled with inadequate urban planning, has not only perpetuated past racial and class-driven spatial inequalities but also encouraged uncontrolled development inside and outside the urban edge. Consequently, Rustenburg is characterised by upper-income gated communities and a continued mushrooming of peripheral and uncontrolled informal settlements to accommodate economic migrants seeking job opportunities with mining companies and also those mineworkers who have opted for living-out allowances. Desegregation levels are moderate to low. Three-quarters of the residents of the traditional white suburbs in Oos-Einde and Safari Tuine remain white, while the gated community in the Cashan suburb contributes to an elite form of enclaving in Rustenburg. The low levels of desegregation extend beyond the white suburbs, so that, for example, nearly 70% of residents in the former Indian area, Ziniaville, remain Indian. For more on these topics, see Bezuidenhout and Buhlungu (2015), Ojajorotu et al. (2015) and Stone (2014).

The historical settlement patterns also continue to have implications for travel distances. For instance, because Rustenburg is a spatially segregated city, about 26% of those who commute daily between the Boitekong and Phokeng townships and jobs and job opportunities in the city of Rustenburg have to take two taxis to reach their destinations (Rustenburg LM 2010). Long travelling distances also have a bearing on the time that members of these poor communities spend travelling. For example, a one-way trip of just over 15 km takes between 46 and 60 minutes, adding up to many hours being spent on daily commuting (Rustenburg LM 2010).

RUSTENBURG: BOOM AND BUST IN A MINING TOWN



Source: MapAble (2017)

FIGURE 10.1 Urban sprawl in Rustenburg, 1990 and 2014

The second important spatial trend is the failure to integrate infrastructure. The need to integrate infrastructure is at the heart of any government programme on spatial planning and development. With its rapid population growth, Rustenburg LM has struggled to develop infrastructure that can provide adequate services (see Table 10.1). As in other local municipalities, the success of the programme for spatial planning and development of the Rustenburg LM will depend partly on the availability of and access to bulk service infrastructure for water, sanitation and electricity. Besides struggling with spatial disintegration, Rustenburg is finding it difficult to establish fully integrated human settlements because of backlogs in the provision of certain bulk service infrastructure. Not only the informal settlements but also formal housing areas are affected by this problem. However, contrary to the slow-paced municipal-driven infrastructure development programme, it would seem that a similar programme undertaken by the Royal Bafokeng Tribal Authority on their tribal land is slightly ahead in many respects. It is argued that payment of royalties by platinum mines and the quasi-government status of the Royal Bafokeng Traditional Authority has resulted in significant investments and improvements. The improvements in infrastructure, basic services and social amenities such as schools and clinics, have in turn led to an influx of the Bafokeng tribe and other ethnic groups into Bafokeng area (Ojakorotu et al. 2015).

Table 10.1 shows Rustenburg residents' level of access to infrastructure services. The decline in the percentage of households with indoor water provision from 35.7% in 1996 to 28.5% in 2016 is a matter of concern. In 2011, just over 40% of the total population of Rustenburg lacked access to adequate sanitation. Approximately 23.2% of households used pit toilets, 12% used ventilation-improved pit latrines and about 6% were without any form of sanitation or toilet facility.

TABLE 10.1 Rustenburg household services

Services	1996	2001	2011	2016
Percentage of households with indoor water	35.7	21.2	35.8	28.5
Percentage of households with flush toilet	43.8	42.1	57.5	58.7
Percentage of households with electricity	50.5	71.6	83.0	83.8

Source: Stats SA (2012, 2016)

The third important spatial trend has to do with the change in policies for mineworker housing and changing labour regimes, complicated by the mineworkers’ responses to these (Marais 2018; Marais, et al. 2018). Historically, mining companies provided housing for most of their employees. White workers mostly rented houses from the mines at below-market prices, while black workers, being migrants who were denied permanent residence in South Africa, were mostly housed in compounds. By the mid-1980s pressure was mounting to provide homeownership to mineworkers (Crush 1992). The post-apartheid government also argued for the dismantling of the compound system. The White Paper on Mining and Minerals of 1998 argued in favour of open towns and integrated settlements. The dismantling of compounds led to the displacement of people and informal settlements became the option for those who could not find accommodation in upgraded compounds. But the traditional migrant labour system nevertheless continues today. Hence, it might also in this case be relevant to note that a large percentage of mine workers are migrants from other provinces, with strong ties to so-called ‘labour sending’ municipalities. This contributes to the limited investment in housing, as stated in the next paragraph. The mining companies have also changed their housing policies, partly in response to pressure from the labour unions which, since the mid-1990s, have strongly advocated living-out allowances for the black workforce, to which the white workforce was already entitled. Because living-out allowances enabled mineworkers to make their own housing arrangements, informal settlements near the mines became a viable option.

Besides the changes in the housing policy, changes in labour regimes have also contributed to the establishment of informal settlements. Outsourcing has become more common. Most contract workers do not earn large salaries and they do not have a strong commitment to the town where they work (Burger & Geldenhuys 2018). Shift work, usually four days on and three days off, also has an effect, as it allows for more mobility. Higher levels of mobility and migrant labour mean lower levels of permanent settlement, which in turn means limited investment in housing and consequently an increase in informal settlements.

The mineworkers' responses to these changes have had their effect on spatial development in Rustenburg. The upgrading of the compounds and the availability of the living-out allowance have meant that mineworkers can now make their own decisions. The 2011 census data shows that more than 82 000 households have opted to live in informal settlements. For many mineworkers, permanent or contract, living conditions have still not improved despite the dismantling of the compound system.

The problems described above have evolved within a particular context. Despite the government policy intentions of overcoming the negative consequences of apartheid planning, mineworkers' housing conditions remain desperate. Informal settlements have become the new compound. The linear thinking that discarding apartheid policies will necessarily lead to adequate housing provision in mining environments does not hold. Effectively, the loosening-up of state control, allowing mineworkers to make their own housing decisions, and the continuation of migrant labour, have contributed to the growth of informal settlements. This is a reflection of power relations and the weak position of the municipality. Despite its good intentions, the municipality is unable to force either mining companies or mineworkers to achieve higher densities in response to national housing policy directives. Informal settlements continue to expand, despite the municipality's adoption of progressive strategic planning policies (Rustenburg LM 2010, 2016a). Hall (1982) aptly noted that the impact of unintended consequences is a key observation.

10.4 Difficulty translating principles into practice

The planning documents and the interviews with municipal officials revealed a certain level of commitment by the Rustenburg LM to dealing with spatial problems. The municipality has established two directorates, one for strategy and planning and one for planning and human settlements, that are responsible for formulating and implementing the IDP and the SDF, respectively. The SDF notes that the mining industry hampers spatial planning. The sporadic and unplanned informal settlements next to mining shafts remain a major challenge while the boom and bust nature of the industry makes any long-term planning difficult. The SDF advocates for infrastructure and development projects that will redress spatial imbalances, implement land use management principles, achieve densification, combat urban sprawl and promote corridors and infill development (Rustenburg LM 2010). Among the specific concerns the SDF notes are the traffic jams caused by the lack of an integrated public transport system (Rustenburg LM 2010).

Laldaparsad et al. (2013) noted that one of the key spatial priorities of the current SDF is investment in residential developments inside the urban edge, guided by the availability of an integrated public transport system. Focusing on public transport as one of the possible mechanisms to facilitate spatial restructuring in the city, the current IDP (Rustenburg LM 2016a) calls for investment in Rustenburg Rapid Transport, called 'Yarona' (from Setswana *ke ya rona*, 'it is ours'). The documents and interviewees emphasised three spatial concerns: the lack of integrated settlements, the lack of an integrated public transport system, and the issue of spatially fragmented development due to haphazard informal settlement development. The absence of an effective action plan is probably attributable to the failure by local leadership to bridge the gap between knowledge and action (Olsson et al. 2006).

The local municipality's inability to apply the SDF principles and strategies remains a matter of concern. Often, private landowners and business owners dictate the future of land development and the local municipality is usually unable to stand up to them. By employing what interviewees called 'bullying tactics', the owners of some private businesses forced the

Rustenburg LM to 'chase' rather than 'lead' business development aimed at better space utilisation, and the municipality finds itself obliged to approve their developments after the event. Similarly, the municipality has virtually no control over informal settlements that develop on mine land.

10.5 Internal dynamics that hinder spatial transformation

Despite the municipality's overall commitment to spatial change and spatial transformation, internal institutional problems hamper the effective implementation of the SDF. Five issues require special attention: conflict between municipal directorates, conflict between the municipality and the tribal authority, unanticipated population growth, backlogs in service infrastructure provision, and lack of up-to-date technology.

The lack of coordination or collaborative planning between the two *directorates* – strategy and planning, and planning and human settlements – shows that the silo mentality continues. As alleged by some of the interviewees, lack of internal collaborative planning did not only frustrate the process to formulate both SDF and IDP but has led to disjuncture between the two key strategic documents as well. Further confusion is caused by the unstable relationship between Rustenburg LM and the Royal Bafokeng *Tribal Authority*. The SDF acknowledges that the tribal authority can perform certain local government functions, but it does not say specifically which functions. The SDF refers to all residents living on the Bafokeng tribal land as 'Bafokeng citizens' (Rustenburg LM 2010). Although there is a memorandum of understanding between the municipality and the tribal authority, it could lead to conflict about constitutional powers, especially when disagreements surface. Such power-related conflict involving tribal leadership is not a new phenomenon in the region. Similar conflicts happened in the 19th century when the three dominant tribal nations, Bafokeng, BaTlokwa and BaKgatla were consistently in conflict with each other. For instance, in 1790 the Bafokeng was involved in a 'twenty-year hostility' with BaTlokwa and a prolonged war with BaKgatla, while BaKwena were in conflict with BaKgatla most of the time (Morton 2008). Although literature as well as current local politics and

governance in the Rustenburg Local Municipality is informed more by the Royal Bafokeng nation, the presence and existence of other nations such as BaKgatla and BaTlokwa should not be overlooked.

Rustenburg's *population* is increasing, and the municipality does not have the capacity to manage the influx and settlement of people. It failed to anticipate the scale of population growth and the accommodation needs that accompany a boom in the mining industry (Hendler & Wolfson 2013). There are backlogs in providing *service infrastructure* across sectors, which can in the main be attributed to the high municipal vacancy rate, with the 2015/2016 annual report showing 2 120 vacancies, which translates into a 53.5% vacancy rate (Rustenburg LM 2016b). The growing shortage of housing and increased number of informal settlements in Rustenburg must be seen not only as a failure by government but also the failure of mining companies to execute their social corporate responsibility by ensuring home ownership amongst the unemployed and low-earning workers, especially low-paid rock drillers (Stone 2014; Ojakorotu et al. 2015). Some of the interviewees said the slow pace of spatial transformation was partly attributable to the municipality's lack of crucial *technology*, such as a GIS.

10.6 External dynamics that hinder spatial transformation

Landownership remains one of the hindrances to effective spatial planning and transformation in Rustenburg. The bulk of the land in and around Rustenburg is currently owned by three mining companies, the Royal Bafokeng Traditional Authority and private landowners (Hendler & Wolfson 2013; Rajak 2012). The current disproportional distribution of landownership between the municipality and private owners often means either delays or stalled implementation of spatial restructuring projects envisaged in the IDP and SDF.

The implementation of the municipality's programme for spatial planning and transformation in Rustenburg is also held up by national government projects that are imposed on the municipality with little or no regard for the SDF and IDP plans. Some interviewees alleged that the peripheral location of a national flagship housing project run by the National Department of

Human Settlements in the Marikana area is the result of a lack of adequate consultation between this department and the local municipality during the planning and implementation phases of the project.

10.7 Conclusion

Despite the adoption of some of the most progressive policies and legislation, Rustenburg remains spatially disintegrated after more than two decades of democracy. Spatial disparities still exist. The current spatial disintegration can be ascribed partly to a lack of state-owned land, particularly by the Rustenburg LM, and also the lack of concrete and feasible action plans to implement the SDF's spatial goals. Senior municipal officials and policymakers tend to pay only lip service to issues of spatial planning and transformation in Rustenburg. There is a lack of decisive local leadership and sound collaborative planning between the local municipality and the three other key stakeholders, the mining companies, the private business community and the Royal Bafokeng Tribal Authority. The situation is further exacerbated by limited internal collaboration, serious capacity problems and a lack of up-to-date technology.

The dismantling of the compound system and the negotiation of a living-out allowance were intended to improve mineworkers' living conditions but instead the compounds have largely been replaced by informal settlements. The unintended consequences of those decisions, such as the escalating demand for basic services and the associated costs of providing them in the fragmented and sprawling urban region, and the lack of control over development, have created a wicked problem for the municipality.

The fact that some informal settlements are located on tribal land also means that they avoid the bureaucratic problems of formal development and, moreover, effectively reduces travelling costs between places of work and residence. The sprawling informal settlements illustrate the municipality's difficulty in guiding spatial development actively, especially when faced with the power of the mining companies and their decisions. Though living-out allowances were originally introduced to give mineworkers better options, this has not helped to improve their living environment, but rather replaced it with an admittedly more affordable but lower quality environment. Formalising these settlements

may improve mineworkers' housing, but it may also trigger another set of unanticipated and possibly undesirable effects, influenced by the cycles of boom and bust in the mining industry. Rustenburg LM is caught between the mining companies, with their labour regimes and land ownership, and the tribal authority, with its different set of values – a situation that creates a complex set of dynamics beyond the control of any one role player.

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CHAPTER 11

SOL PLAATJE: PLANNING ON AN OLD MINING SITE

Thomas Stewart

11.1 Introduction

The city of Kimberley had its humble beginnings as a mining town during the diamond rush that followed the first discovery of diamonds at Hopetown in South Africa in 1866. The town was established in 1871, when diamonds were discovered on Colesberg Kopje on the farm Vooruitzicht. The De Beers mining company was founded here in 1888. Kimberley is notable for having been the first city in Africa and the southern hemisphere, and the second in the world after Philadelphia, to install electric street lights (in September 1882), and for having the first stock exchange in Africa (founded in 1881). It was also the first city in South Africa to use the compound system to accommodate mineworkers. Pirie (1991:21) said Kimberley was the city



where the “first formal strategy of racial residential segregation was devised and implemented”. He further said that black and white workers “were deliberately residentially isolated” and that the slum-like conditions paved the way for the start of public housing, and by legislating it through the 1920 Housing Act.

Black workers were also housed in a satellite town, later named Galeshewe, after the baTlhaping chief, Kgosi Galeshewe. The coloured community, largely of Malaysian origin, settled in an area that became known as the Malay Camp. This remained the settlement pattern until after 1948, when apartheid planning legislation forcefully removed the coloureds to an area known as Greenpoint. During the resulting Defiance Campaign and the Mayibuye Uprising of 8 November 1952, objecting to the forced removals and the poor housing, lighting and public transport, several leaders from the non-white areas were arrested and some were shot and killed. All areas that housed people other than those of European origin continued to be provided with services inferior to those of the rest of the city. Even the governance of those areas was ‘separated’ and placed under the auspices of central or provincial government structures (Sol Plaatje LM 2017).

The towns of Kimberley and Beaconsfield amalgamated in 1912 as the City of Kimberley, while Galeshewe remained a separate township in terms of apartheid policies until after 1994. From the rapid initial boom, Kimberley went through various phases of development and urbanisation, changing from a mining town to a service centre and provincial capital.

In the democratic dispensation, the former Kimberley City Council was named Sol Plaatje Local Municipality, after the writer and activist Sol Plaatje, who lived in Kimberley for most of his life. The expanded municipal area included surrounding towns and villages, of which Ritchie is the most notable. The former Diamantveld District Council became the Frances Baard District Municipality, after the trade unionist Frances Baard, who was born in Greenpoint, Kimberley.

Sol Plaatje LM, with Kimberley as its main urban node, functions as the administrative centre and political, educational and cultural capital of the Northern Cape province. As the second largest municipality in the district, it covers 316 036 ha. It had a population of just over 255 351 in 2016 (Stats SA 2016) and houses 20% of the population of the province. It has many pleasant neighbourhoods, a school system that performs above national norms and a relatively compact layout with former township areas located close to the city centre (see Figure 11.1). The municipality is served by 65 elected councillors.

Sol Plaatje LM has many similarities with other South African cities that originated as early colonial mining settlements. It is a central service centre and a provincial capital. It has the problems of planning for both urban and rural components. It has an apartheid-imposed spatial structure and its formal and informal spatial transformation has taken place against a background of rapid urbanisation.

Complex systems function over several spatial and temporal scales that interact with one another. Spatial mismatches arise when the scales of change, management or institutions are not aligned. A further problem is rigidity, which occurs when a system becomes 'stuck', reducing its flexibility and resilience. Among the causes of rigidity in Sol Plaatje LM are material conditions such as historical mining rights, land ownership, spatial fragmentation, the reality of structural poverty and selective investment as a residual effect of apartheid policies.

Spatial transformation is happening in Sol Plaatje, despite there being no set targets in any of the policies or plans, including the SDF. Transformation is particularly evident in the residential suburbs, in the form of the middle class buying up properties in the poorer residential areas (a process known as 'downward raiding') and lower-income households' 'crisis-selling' (Thirkell 1996), reminiscent of market forces at work. The combination of these two apparently adverse processes, which Lemanski (2014) called 'hybrid gentrification', has incongruously resulted in greater spatial equity and transformation. This is particularly evident in the middle to upper income

areas of Cartersglen, Royaldene and Hillcrest, in the lower middle income areas of Beaconsfield and in the CBD. There are other signs of transformation as well. The Hull Street social rental housing project, a 'designed intervention', is hailed as an example of successful social integration and transformation. The expansion and upgrading of Lerato Park informal settlement was mentioned in interviews as a spatial transformation initiative, as it will link the former coloured area of Roodepan and the African township of Galeshewe. However, being a presidential 'catalytic' project, its implementation will depend on the success of the investment drive by the Department of Human Settlements and on land owned by the municipality being available, rather than on the SDF and transformation imperatives.

The population of Sol Plaatje increased from 205 103 in 1996 to 255 351 in 2016 (Stats SA 2016), an average increase of 1% per annum. At the same time, the number of households increased from 45 321 to 72 012, an average increase of 8% per annum. The average household size has thus decreased from 4.53 to 3.55 people per household. Given that this is a large municipality with a large rural component, the average population density is very low, with only 0.81 people and 4.39 households per hectare. The growth in population and decrease in household size has inevitably increased the demand for residential land and municipal services. From 2001 to 2011, the percentage of people employed remained stable at around 25.4%, while the unemployment rate fell from 41.3 to 31.6. Youth unemployment is, however, alarmingly high at over 40%.

Service infrastructure has not kept pace with the household increase. From 2001 to 2011 the percentage of households with piped water increased from 51.2% to 61.9%, the percentage with electricity for lighting increased from 82.4% to 84.9%, the percentage with flush toilets decreased from 83.4% to 82.8%, and the percentage with a waste removal service decreased from 90.8% to 84.3%. A further factor holding back infrastructure development was a moratorium on all new developments, resulting in an increase in informal settlements that have not been properly planned or serviced. Despite the municipal constraints, the actual number of households with access to municipal services has increased substantially since 1996.



Source: Sol Plaatje LM (2016)

FIGURE 11.1 Kimberley central business district around the Big Hole

The estimated housing backlog for the Sol Plaatje is 11 803 houses. The municipality has passed approvals for 12 607 houses, but the medium-term budget will allow for the delivery of only 5 000. In this process, parts of Lerato Park, Snake Park, Jacksonville and Freedom Park will be developed. The necessary infrastructural and capital expenditure has been budgeted for and approved.

The establishment of Sol Plaatje University in 2013 has enlivened the Kimberley CBD and is expected to stimulate regeneration in the form of residential and commercial developments to provide support structures for the university. The university has high visibility as it is centrally located in the CBD. The administrative and academic components of the university will have an outreach around the civic open space of the city, with maximum accessibility to the city and its surrounds. To aid transport, the university is promoting cycling by providing students with bicycles. With its iconic potential, the university will help the municipality gain a competitive advantage. The university, viewed as a node in itself, has given civic life and social cohesion a much-needed boost (Sol Plaatje LM 2017). It has improved the municipality's profile and strengthened its importance nationally.

As is the case in many municipalities in South Africa, inadequate bulk infrastructure and the incapacity to improve it poses a serious threat to the development of Sol Plaatje LM. Responses to date have been on an ad hoc and crisis management basis. A moratorium on new developments (mentioned above) was declared in 2001 due to a shortage in bulk services. The moratorium lasted until 2010/2011, causing a period of no or very little investment in the city. The absence of a services master plan has relegated all other plans and development initiatives to a secondary status.

A very real and practical problem that municipal officials mentioned in interviews is the ongoing fiscal tension as a result of budgetary and project cycles not coinciding. On top of this, the municipality does not have a sufficiently strong capital budget to implement the planned and required municipal and professional services. Interviewees also noted, however, that numerous

sources of funding available to Sol Plaatje LM have been underutilised, partly because of lack of awareness of their existence and partly because of lack of administrative capacity to make the appropriate applications.

11.2 Spatial transformation challenges

‘Spatial transformation’ remains an elusive concept, defined and interpreted in different ways. Redressing the consequences of apartheid planning did, however, recur as a common theme in the interviews and it is an important theme in the 2017 IDP for Sol Plaatje LM.

The purpose of a municipal SDF is to provide a land use framework for the IDP, which is in turn aligned to the IUDP and the NDP. At Sol Plaatje, however, municipal functionaries tended to focus on their own line management responsibilities, producing typical operational ‘silos’ that were carried through to higher and subsequent levels of planning and implementation. The planning department saw the IUDP as relevant mostly to metropolitan municipalities, despite Sol Plaatje being targeted as a pilot project for the implementation of the IUDP. They therefore saw developing the SDF primarily as a town planning function, involving some ad hoc engagements with other municipal departments in the process.

Todes et al. (2010) argued that elements of traditional master planning, typically rigid and static in its approach, have persisted since the 1970s in South African long-term planning. However, interviews with municipal officials and politicians with regard to informal settlements and problems with services suggested that this picture was changing. SDFs are moving on from being merely a blueprint to slowly progressing towards being a guideline for planning and implementation. The SDF vision of socio-economic change and development can easily become a motivation in physical planning. But the rapid urbanisation experienced by many urban and semi-urban areas calls for rapid response mechanisms which are not offered by the SDF.

The legacy of the historical top-down and master planning approaches was evident in interviewees' expressions of satisfaction with the notion of having plans and getting those plans approved. Interviewees quoted legislation and policies to be complied with. When 'compliance' becomes the favoured operational term, the energy required for putting plans into action is diverted into constantly revising and updating such plans. It becomes an endless game of catching up. Transformation requires an active and proactive approach, not just a regulatory and compliance agenda.

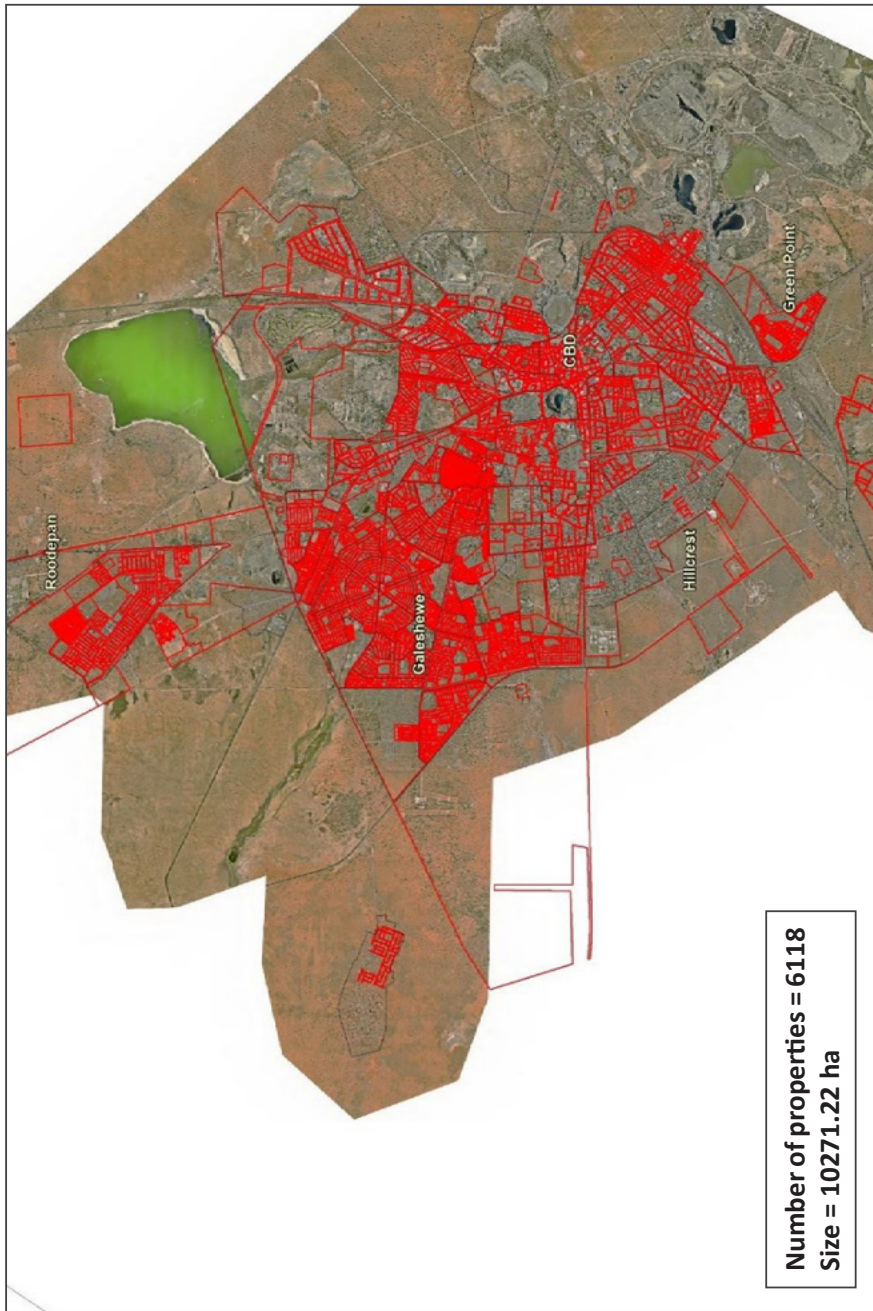
Despite having officials and politicians who are responsible and accountable for compiling and implementing plans, the human capital capacity of Sol Plaatje LM is limited, and it has therefore resorted to outsourcing technical and professional work. The 2008–2012 SDF and the 2017 SDF were both outsourced to external private sector urban and regional planners, the former to Aurecon South Africa and the latter to Uddi Environmental Planning and Development Consultants. The independent professional contributions of private consultants have their benefits, but the client – the municipality – needs to be sufficiently capacitated, educated and experienced to brief the consultants and guide, manage and, if necessary, challenge the resulting plans and proposals.

The shortage of capacity appears to be an ongoing problem at Sol Plaatje LM. There are several vacancies for key positions in the departments of engineering, urban planning, human settlements and finance. And although the political capacity may be experienced and supportive, the interviews revealed that it may lack the knowledge, skills and experience to take the lead in implementing initiatives, plans and projects.

Sol Plaatje's situation is complicated by two major spatial legacies, its mining town background, and its colonial and apartheid past. These have dictated its current spatial configuration. Its history as a diamond mining town with individual mining stakes produced its informal street patterns and irregular settlement patterns, and colonial sentiments and apartheid legislation further fragmented the city's structure. These two legacies, in conjunction with large portions of privately owned land, mining activities and former

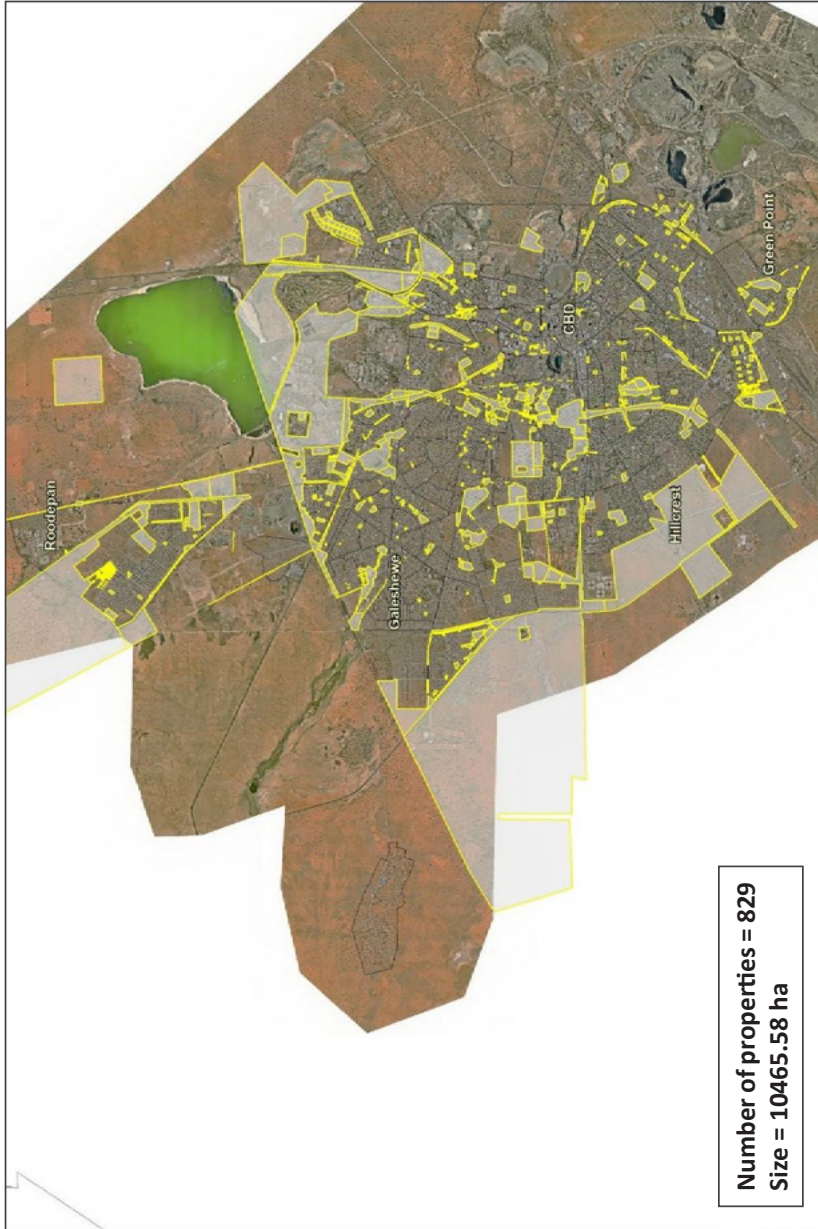
mining activities, gave it an unusual spatial history and complex layout. The fragmentation of the city is particularly notable in Roodepan, the traditional coloured township to the north of the CBD (see Figure 11.2).

Large parcels of land are still occupied by diamond mining activities, mainly in the central and eastern areas of Kimberley. No change of land use can be expected on these parcels within the next ten years. The presence of the Big Hole, the largest open-cast mine in the world, excavated by hand, and the vast areas of mining land (see Figure 11.3), contributed to the fragmentation of the city.



Source: Sol Plaatje LM (2016)

FIGURE 11.2 Fragmentation of Kimberley, with Roodepan to the far north



Source: Sol Plaatje LM (2016)

Note: Municipal properties demarcated in yellow, mining properties in light grey and privately owned properties in dark grey

FIGURE 11.3 Municipal and mining land in Sol Plaatje

11.3 Spatial and development planning

11.3.1 Spatial development framework

The quest for certainty, order and predictability in the chaos of complexity forms the backdrop to municipal planning initiatives. The IUUF (RSA CoGTA 2016:39) identifies the following aims:

- To forge new spatial forms in settlement, transport, social and economic areas (spatial integration).
- To ensure people have access to social and economic services, opportunities and choices (inclusion and access).
- To harness urban dynamism for inclusive, sustainable economic growth and development (growth).
- To enhance the capacity of the state and its citizens to work together to achieve spatial and social integration (governance).

Sol Plaatje's first SDF, dated for the period 2008–2012, was approved on 25 May 2009. A new SDF, dated September 2016, was later drafted in terms of SPLUMA and approved by the city council for public participation in May 2017.

A new IDP for the current local government term has been approved and the SDF has been aligned to the objectives and priorities of the IDP, to make it a core part thereof. The IDP has a long list of goals for Sol Plaatje LM: It is to be a clean city; a city that attracts investment, manufacturers and tourists; a city with good infrastructure; a safe and secure city; a city that cares; a city that facilitates the creation of jobs; a city that houses people; a city with youth involved productively; a city that harnesses integrated development; a city that facilitates skills development; a city that invests in public participation and is connected with the people; a city that works together; and a city with a good internal growth rate harnessed to build integrated human settlements.

In the course of assessing the above and conducting structured interviews with key officials, some interesting findings were made. For example, it was confirmed that the IDP and SDF processes happened in parallel, rather than interdependently. The IDP manager and the town planners responsible for the SDF are in different departments, despite the SDF being a 'core component' of the IDP as per the Municipal Systems Act of 2000. As mentioned earlier, the SDF is seen as a town planning function, while the IDP is the responsibility of the IDP manager, who is not a town planner but the municipality's chief financial officer, inevitably concentrating on monetary implications and financial and legal compliance matters.

Sanyal et al. (2012) emphasised the importance of urban form and its influence on the choices people make, the impact of sprawl on travel time and costs, socio-economic differentiation, and the allocation of resources. These sentiments are to some extent echoed in the IDP. It says that a transformed spatial structure, reversing "inefficient land use patterns", is the sustainable basis for the provision of municipal services. At the same time, however, it supports "universal access to basic services" and "differentiated service requirements of households and human settlements". This approach seems to accommodate differentiated needs, but it also provides an excuse for providing substandard or inferior services.

Although spatial planning practices are starting to embrace complexity in planning, there seem to be underlying conflicts, as evidenced, for example, in an interview with the city engineer who wanted a 'blueprint' plan to focus on the provision of municipal services. The vagueness of the IDP as an 'integrated' plan with broad objectives means it gets interpreted as a plan that lacks clear objectives. One councillor interviewed was of the opinion that the IDP reflects community demands and needs, for example for infrastructure and housing; hence, this is reflected in the SDF. Both of these views reflect an oversimplified idea of how to deal with the complexity of urban planning problems.

Motswedimosa and Diamond Park are to be developed as new greenfield subsidised houses. This will exacerbate the problem of urban sprawl and sustainability, with the former located adjacent to the rural village of Richie

some 40 km from Kimberley, and the latter at the periphery of the city, adjacent to the former residential relocation area of Greenpoint to the south-east of the city. This is being done while the development of better located informal settlements are delayed. Aggravating the problem, there is little integration between the municipal departments and provincial programmes for funding housing and infrastructure, with the result that delivery of houses and infrastructure is uncoordinated. The municipality has adapted its strategy of housing development by considering current informal settlements as areas for future development, rather than identifying new greenfield sites. This response effectively implies 'planning by default' or, retrospectively, defeats the notion of planning being anticipative of future needs. Despite the municipality's response largely being a 'rear view mirror' approach, it does target a more integrated reality.

11.3.2 Quality of the spatial development framework and planning process

The draft SDF is technically of a high professional standard and it gives comprehensive coverage to most, if not all, of the SPLUMA requirements. The outsourcing has had the advantage of independent service providers adding value, while the municipal officials were able to influence the process by having inside information. The municipal town planners and officials in other municipal departments that have been involved, confirmed a sense of ownership of the SDF.

It is one of the goals of the SDF to coordinate development, but this hardly ever happens. For example, new developments in Sol Plaatje are dictated by land invasions, developer preferences (market forces) and land ownership, resulting in a disjuncture between new developments and municipal plans. In instances where they are aligned, this seems more coincidental than by design. The same applies in the informal settlements, where land invasions dictate which areas get infrastructure installation and upgrading. Although on a broad scale, the municipality plans by means of its IDP and SDF; on a

smaller scale, townships are established, and new developments happen in areas where they were not planned. This calls into question the relevance of the broad scale plans.

11.3.3 Degree of implementation

The municipality implements the SDF through the municipal land use management scheme. The outsourcing of the SDF inevitably results in a measure of disconnect between the authors and implementers, exacerbated by the lack of a clear definition of the envisaged transformation and transformation targets.

The SDF remains difficult to implement because funding for projects and capacitating staff or employing capacitated staff is limited. The result is that despite regular revisions, not enough attention is focused on revising and reviewing the SDF, ultimately leading to it being reduced to a compliance issue rather than a real guideline and land use management tool. Implementing the plan is further constrained by the municipality's shortage of bulk services. The implementation of human settlement projects is a municipal function and a useful means to transform the city. However, it requires municipal accreditation by the National Department of Human Settlements, which has only partially been achieved by Sol Plaatje LM, limiting its ability to achieve the SDF goals.

Spatial transformation is specifically mentioned in the IDP in the context of transforming Kimberley's spatial structure into an equitable, inclusive, efficient and compact form, consisting of a series of integrated and well-connected economic corridors, nodes and attractive mixed-use or mixed-income sustainable areas. However, most actions have been taken in the informal settlements north and south of Kimberley and in pockets of informal settlements in the Roodepan (Lerato Park) and Richie (Motswedimosa) areas. Some of these informal settlements are already receiving attention in terms of current human settlement projects which are at various stages of

development. The provincial programme to clear the housing backlogs has various stages running parallel to each other, including land preparation, implementation of services and, finally, the construction of houses.

The SDF aims to reduce the fragmentation of the city by physically connecting areas so citizens will have freedom of movement and be able to interact with one another. To do this, the municipality will need to work on an effective public transport system. The successes of and access to social, economic, financial and environmental interventions will determine the value of such interventions.

Given the spatial characteristics of Sol Plaatje LM, a compact city model is probably the form most suited to the context and most sustainable. However, it may not be easy to convince people in an otherwise rural setting that higher density living, less or no access to a private garden and urban agricultural activities, is desirable.

11.4 Spatial planning and complexity lessons

An assessment of Sol Plaatje's SDF, the process by which it was generated and the way it is being implemented, makes it clear how complex and comprehensive planning is in a dynamic environment. From the interviews conducted and documents studied, the following lessons were identified.

In the absence of a new scheme, the town planning scheme, launched in 1987 with a 20-year horizon, was firmly rooted in the race consciousness of a traditionally white city council and was still being used at the time of writing.

Private land ownership associated with developmental constraints can be a serious impediment to urban transformation, social justice and spatial planning. Some of this municipality's best located portions of land are owned by mining companies that are reluctant to sell, rehabilitate or develop the land. The municipality owns only about 3% of the available vacant land. The SDF suggests that a land audit with a focus on infill, and inclusionary and mixed-

use opportunities should add substantial value. The extent and urgency of the needs of informal settlements seem to overshadow smaller but significant opportunities and initiatives that could enhance spatial transformation.

Municipal infrastructure, administrative and financial capacity are paramount for transforming the city. The bulk infrastructure shortage became such an impediment that all focus was on installing it, necessitating a moratorium on new developments at a time when rapid urbanisation was continuing unabatedly. The importance of bulk infrastructure should, hence, not be underestimated.

Administrative ‘silos’ hamper the development and transformation of the city; not only in the municipality but across all three tiers of government. Only in the latest IDP has attention been paid to the integration of various plans and strategies. Participation and cooperation in compiling the SDF still seem to be done on a piecemeal basis.

Planning initiatives need to be more conducive to private and public investment and development to avoid a disjuncture between municipal goals and actual investments and development. The perception that the municipality can direct development is ambitious and can only be realised if the government departments and private developers are engaged in the early stages of revising the IDP and SDF. Currently, as is the case with most municipalities, stakeholders are consulted as a matter of legal and administrative compliance, rather than in an effort to forge collaboration. Evidence of this is that consultation takes place only after the final or pre-final IDP and SDF documents have already been drafted. Despite the so-called ‘consultations’, market forces and government budgets determine when and where developments take place, as has been the case with the newly built Kimberly Mental Health Hospital, whose location was apparently chosen because the land was owned by the provincial government, rather than being determined by sound spatial planning principles and the practical availability of the necessary municipal services.

11.5 Conclusion

Municipal officials and councillors see the SDF and associated processes as a town planning function executed by making use of existing information, reports and documents, with little consultation between the various municipal departments. As municipal objectives are not very explicit in the IDP this allows substantial discretion in the compilation of the SDF. Kimberley, the anchor and biggest town of the municipality, is suffering the consequences of the decline of mining activities. This has made it primarily a tertiary service centre, supported by being the provincial capital. Spatial rigidities continue to influence the spatial form, and the historical influence of mining activities still affects landholdings and the municipality's development potential. A clear example of the restricted response mechanisms available to shape the form of South African cities is demonstrated by the informal development of land, outpacing the formal planning processes, the municipality lagging in providing services and formalising such developments. However, despite these mismatches, spatial transformation, both planned and unplanned, is happening.

Spatial transformation has happened in two ways: First, previously neglected areas have been receiving municipal services and are substantially better off than they were 20 years ago. Second, ongoing socio-economic and racial restructuring is happening in the suburbs, driven by market forces and changing the profile and composition of former white suburbs. While the SDF is well intentioned and provides a sound platform and benchmark to guide spatial transformation, it may need more buy-in from communities and investors if it is to have a significant effect on the spatial future of Sol Plaatje LM. It also needs to consider lucrative incentives to attract private investment that will bring about spatial transformation.

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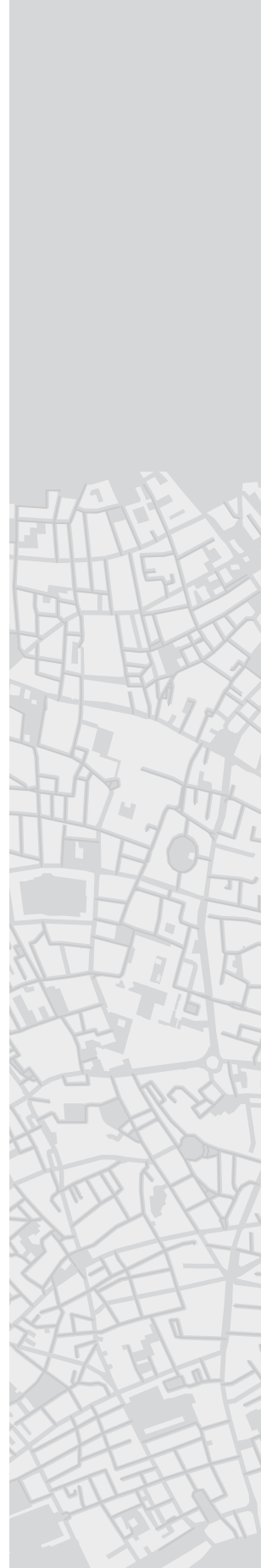
CHAPTER 12

STELLENBOSCH: CHANGE COMES TO A HISTORICAL UNIVERSITY TOWN

Danie du Plessis

12.1 Introduction

Stellenbosch is the second oldest town in South Africa, with a history dating back to 1679. In the pre-1994 era the towns and settlements in the area were separately administered. Stellenbosch, Franschhoek, Jamestown and Pniel were municipalities for white residents; Cloetesville and Idas Valley were for coloured residents and were represented by Coloured Local Advisory Councils; Kayamandi was for black residents and was administered by the Central State; and the surrounding rural settlements were controlled by the Cape Provincial Administration. Today, the town of Stellenbosch is part of the Stellenbosch LM, a secondary city covering an area of approximately 831 km² and in 2016 had



a population of 173 419. The Stellenbosch LM administers the main towns of Stellenbosch and Franschhoek and a number of smaller settlements such as Wemmershoek, La Motte, De Novo, Kylemore, Pniel, Johannesdal, Languedoc, Groot Drakenstein, Muldersvlei, Klapmuts, Elsenburg, Raithby, Jamestown, Koelenhof and Vlotenburg. Stellenbosch is known for its educational institutions, including Stellenbosch University and some prestigious schools, and for its world-renowned scenery, winelands and heritage culture.

Stellenbosch LM's socio-economic profile reflects the inequalities prevalent in South Africa. Access to basic services is high (in 2016, 98.1% of the population had a flush toilet, 92.7% had electricity and 66.8% had piped water in their houses), but the municipality is facing the challenge of servicing the growing proportion of informal settlements (up from 15.7% in 2001 to 34.2% in 2016, the second highest of the 25 secondary cities in South Africa). The 2001 and 2011 censuses showed that Stellenbosch had the highest average monthly household income of the 25 cities; yet in 2011, more than half its households (52.9%) were earning less than R3 200 a month. Its Gini coefficient (based on income that includes social grants) increased from 0.53 in 1995 to 0.64 in 2014, indicating a big increase in inequality over this period (Quantec 2018). In its municipal IDP (Stellenbosch LM 2017a), Stellenbosch is described as a "valley of opportunity and innovation", but in 2016 only 28% of its population had an educational level of matric or above, which puts it at 13th position in the list of 25 secondary cities.

The municipal economy is dominated by the tertiary sector, which in 2015 contributed 70.3% of GDP, while the secondary sector contributed 24.1% and the primary 5.7%. Important contributors in 2015 were the financial, insurance, real estate and business services sector (21.6% of municipal GDP and 15.3% of employment) and the retail, catering and accommodation sector (20.2% of GDP and 26.6% of employment). The agricultural sector, despite its considerable extent, contributed only 5.5% of GDP and 12.4% of employment in 2016 (Western Cape Government Provincial Treasury 2017).

The spatial manifestation of these demographic and economic realities, together with the historical spatial patterns, present a challenge for planning in Stellenbosch. Work on the current SDF began in 2010. It was finalised and approved by the council in 2013, then revised during 2017 to accommodate some minor changes to the urban edge, and again approved in May 2017 as part of the IDP process. In parallel, the municipality has started preparing a new SDF to comply with the requirements of the SPLUMA. This involves a number of separate but mutually informing specialist baseline studies that will jointly form the basis for developing alternative spatial development concepts and, subsequently, more detailed future spatial development proposals. This revised SDF is expected to be completed and approved in 2019. The current SDF has thus been the primary instrument for guiding spatial change and spatial planning over the past decade in Stellenbosch and will continue to be so until the new one is adopted. It states four primary aims: To achieve shared growth; to increase access to opportunities, particularly for disadvantaged citizens; to improve sustainability by minimising ecological footprints; and to maintain the unique sense of place of the municipality's towns and regions (Stellenbosch LM 2017b). To achieve these aims, the SDF lists seven strategic objectives: Interconnected nodes, car-free transport, optimal land use, inclusive economic growth, resource custodianship, promoting agriculture and food production, and preservation of heritage. Each of these has a set of associated principles that are intended to guide the future spatial development of Stellenbosch LM.

This chapter looks at how far the aims of the SDF have been achieved.

12.2 Complexity as a lens to assess spatial planning instruments

The systemic view of cities is not new in planning, but it was only in the past two decades that the concepts of complexity and of space and time as relative, have been more widely accepted than the traditional rational comprehensive view that focuses on objects and forms. The concept of a complex adaptive system is central to the new view. A complex adaptive system is a system made up of interacting elements or agents that change and adapt over time

in response to information the system gathers from the environment to determine its own structure. A complex adaptive system can self-organise, adapt to changing circumstances through interactions between its parts, and it is transformed by reasoning agents that can learn and change their behaviour. A complex adaptive system can also evolve from one state to another as it reaches a 'tipping point' and having been stable for a long time can rapidly transform into a new state. Sources to consult on the complexity theory in planning are Baskin (2008), Byrne (2003), De Roo (2010a, 2010b), Graham and Healey (1999), Holling (2001), Huys and Van Gils (2010), Innes and Booher (2014) and Sengupta et al. (2016).

To understand a complex adaptive system in a spatial planning context requires an appropriate view of three key concepts: space, scale and time. First, planning in a complex system requires a relational view of space where proximity does not imply a relationship but where interactions occur at multiple scales, with local affairs being influenced by events in a global system, and also where local events or actors can affect the larger system (Graham & Healey 1999). For example, Stellenbosch's physical proximity to Cape Town does not necessarily imply a strong functional relationship with Cape Town – it may have equally strong or stronger functional relationships with wine producing regions in France or Italy. Byrne (2003:173) put this neatly: "urban systems are complex open systems that are nested in and intersecting with regional, national, block (e.g. European Union) and global systems and which in turn have nested in and intersecting with them individuals, households and neighbourhoods".

Second, regarding scale, it is important to recognise that although a complex adaptive system is shaped by interactions, its structure tends to be hierarchical and may thus include scale-free networks with structures that are repetitive and similar across various levels of development (like fractal patterns) (De Roo 2010b). Numerous interrelated systems operate at different speeds over various spatial scales. Smaller (and in a spatial sense more local) systems tend to function faster and over shorter distances, while larger systems move more slowly and cover larger areas. The larger, slower moving systems usually maintain stability in the smaller systems that have faster cycles of innovation.

For example, the spatial and functional structure of the commercial sector at a neighbourhood or precinct level within a city may evolve fairly rapidly, while these changes (although similar in structure and pattern) will take longer to be revealed at a city or regional scale. To influence these systems, we need to understand both the fast variables (often easy to identify) and the slow-moving ones that may be vital to the long-term future of the system (Holling 2001).

Third, complex adaptive systems are dynamic and change over time, but as different parts change at different rates, the evolution of a city should be viewed from the perspective of relative and not absolute time. Some components of a city, such as the built environment, change slowly, while others, such as commuting patterns, can fluctuate daily. A locally optimal solution may thus not represent the best long-term solution and a fragmented understanding of cities can result in suboptimal city design outcomes (Olsson et al. 2006; Patorniti et al. 2017).

Planning within a complex adaptive system thus requires us to change our way of thinking. We have to make the shift from the assumptions of linearity and rationality and absolute space and time to a mode that promotes learning, relationship building and an understanding of opposing views, where planning has an important role to play in framing the communicative and interpretive processes leading to collective understandings of space and time (Armitage et al. 2008; Graham & Healy 1999; Patorniti et al. 2017). We also have to make the shift from traditional linear models of statistical reasoning to a combination of tools and techniques as a way of understanding the complex causality within specific local systems, which in turn are embedded in interrelationships with other systems, and from identifying interventions in the physical environment on the basis of current situations to a mode of planning that considers time, development and progress (Byrne 2003; De Roo 2010a).

12.3 Intentions, perceptions and realities

This section assesses the SDF's seven strategic objectives for spatial change and planning in Stellenbosch LM (interconnected nodes, car-free transport, optimal land use, inclusive economic growth, resource custodianship,

promotion of agriculture and food production, and preservation of heritage), looking at the intentions expressed in the SDF, the stakeholders' perceptions regarding the realisation of these intentions, and the realities of spatial change as reflected by quantitative data. The stakeholder perceptions here were obtained from semi-structured interviews with municipal officials, municipal councillors, representatives of the Stellenbosch Interest Group, academics, and a representative of the facilities management section of Stellenbosch University. An important element to consider in the evaluation of spatial planning policies is the relevant timespan required to measure the outcomes and impacts of spatial planning instruments. Although it is generally accepted that the timeframe for measuring the outcomes and impacts of spatial plans is long term in nature, realistic timeframes may, however, differ from objective to objective in the same plan.

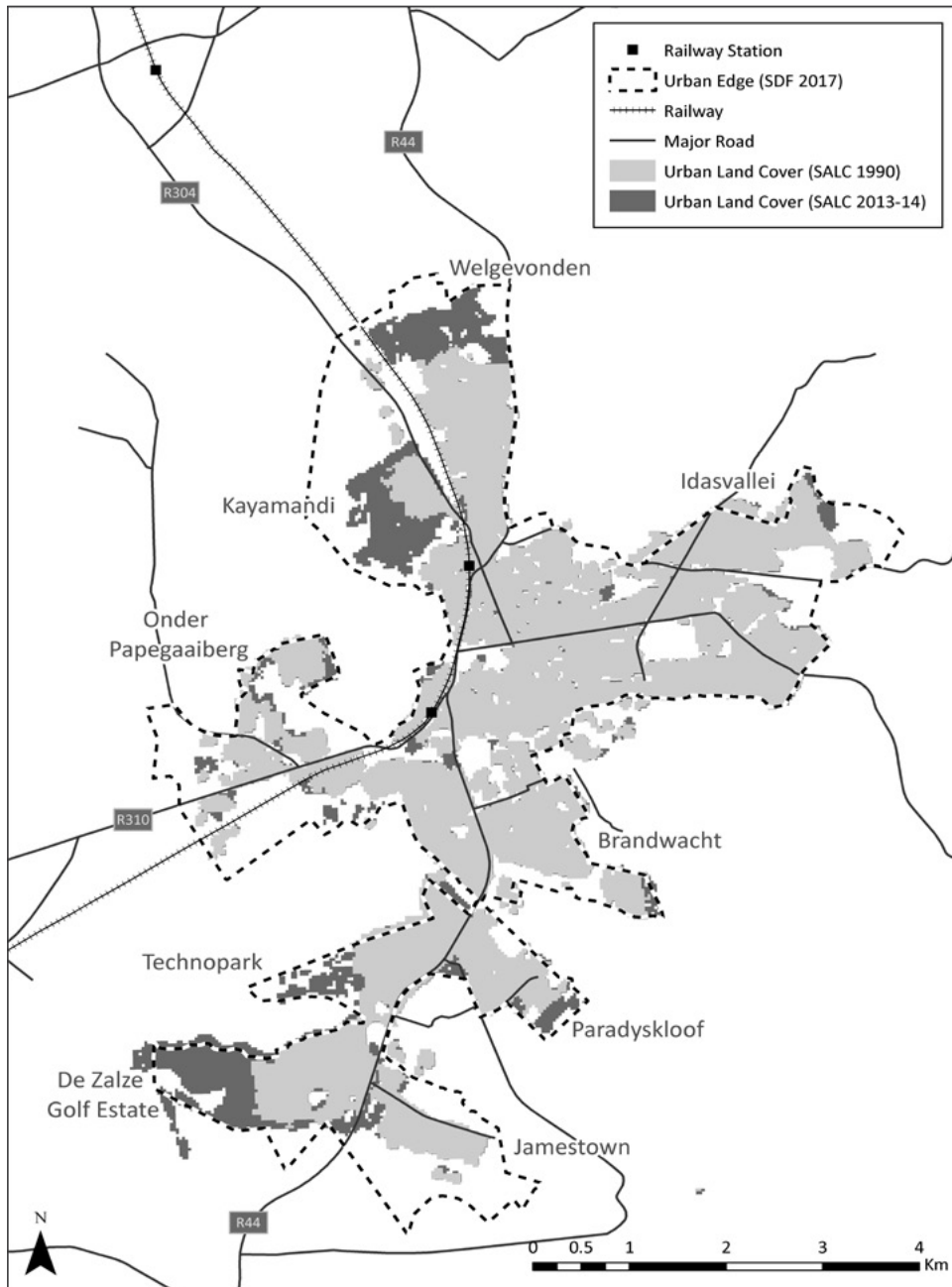
12.4 Interconnected nodes and car-free transport

The Stellenbosch SDF emphasises the need to reduce the number of cars on the road and move to public transport and non-motorised transport (facilitated by adequate pedestrian and cycling facilities and infrastructure). To achieve this objective will clearly require spatial reorganisation, which is why the SDF's first strategic objective is spatial development consisting of interconnected nodes. The SDF prioritises development along railways and major roads and at road intersections (Stellenbosch LM 2017a). It sees increased settlement density as a way to improve the financial viability of public transport. It promotes intensification, integration and mixed use development around railway and bus stations (Stellenbosch LM 2017b).

Respondents' perceptions varied as to how well these intentions were being realised. Most thought that traffic calming, and non-motorised mobility were being successfully implemented, especially the progress made with improvements for pedestrians and cyclists, which seemed to have encouraged more people to walk or cycle. But they observed that very little progress had been made in concentrating new development around railway and bus stations.

Evidence did not corroborate all their views. There did not seem to be any noticeable shift to the use of public transport and non-motorised transport. A transport survey including 512 responses, part of preparations for the Comprehensive Integrated Transport Plan (2016–2020) for Stellenbosch, revealed that the form of transport most used to the most visited destinations was privately owned cars (61.5%). This was followed by minibus taxis (19.1%), walking (9.9%), and cycling (4.5%). Only 3.2% of the respondents in this survey said they mostly commuted by train. The share of walkers and cyclists was 27% in Kyamandi (a low-income area), 13% to 16% in lower-middle income areas such as Jamestown, Cloetesville and Idas Valley, and 5% or less in the Stellenbosch high-income suburbs (Stellenbosch LM 2016). A survey of Stellenbosch University found that only 3% of students and 4% of staff used a bicycle as their main form of transport to the campus (Stellenbosch LM 2016). To put these statistics in proportion they should be viewed against the background of cycling cities of the world such as Copenhagen, Amsterdam and Strasbourg that set the standard for urban cycling. Typically, it took them 30 years or more of promoting and prioritising cycling to reach their current high shares of bicycle transport (Gordge et al. 2015).

Figure 12.1 shows the urban growth pattern of the town of Stellenbosch as the primary development node in the municipality between 1990 and 2013/2014. Clearly, the biggest expansion has been in the north (Welgevonden Estate), north-west (Kayamandi) and south (which includes residential development in the De Zalze Estate and Paradyskloof, and commercial development in Technopark). Some expansion can also be seen in the peripheral areas of Idas Valley and Brandwacht and some smaller pockets of infill development. Very little evidence can be seen of new urban development around railway and bus stations or along major roads and at intersections. In 2016 the railway in Stellenbosch was being used at less than 50% of its capacity and no more than two trains were running at peak hours (Stellenbosch LM 2016). From the broad overall urban development patterns shown in Figure 12.1, it does not appear that the intention of focusing development on public transport infrastructure and interconnected nodes is being realised.



Source: Author’s map based on 1990 and 2013/2014 South African national land-cover datasets from GeoTerralimage (2015)

FIGURE 12.1 Stellenbosch town land cover, 1990–2013/2014

12.4.1 Optimal land use

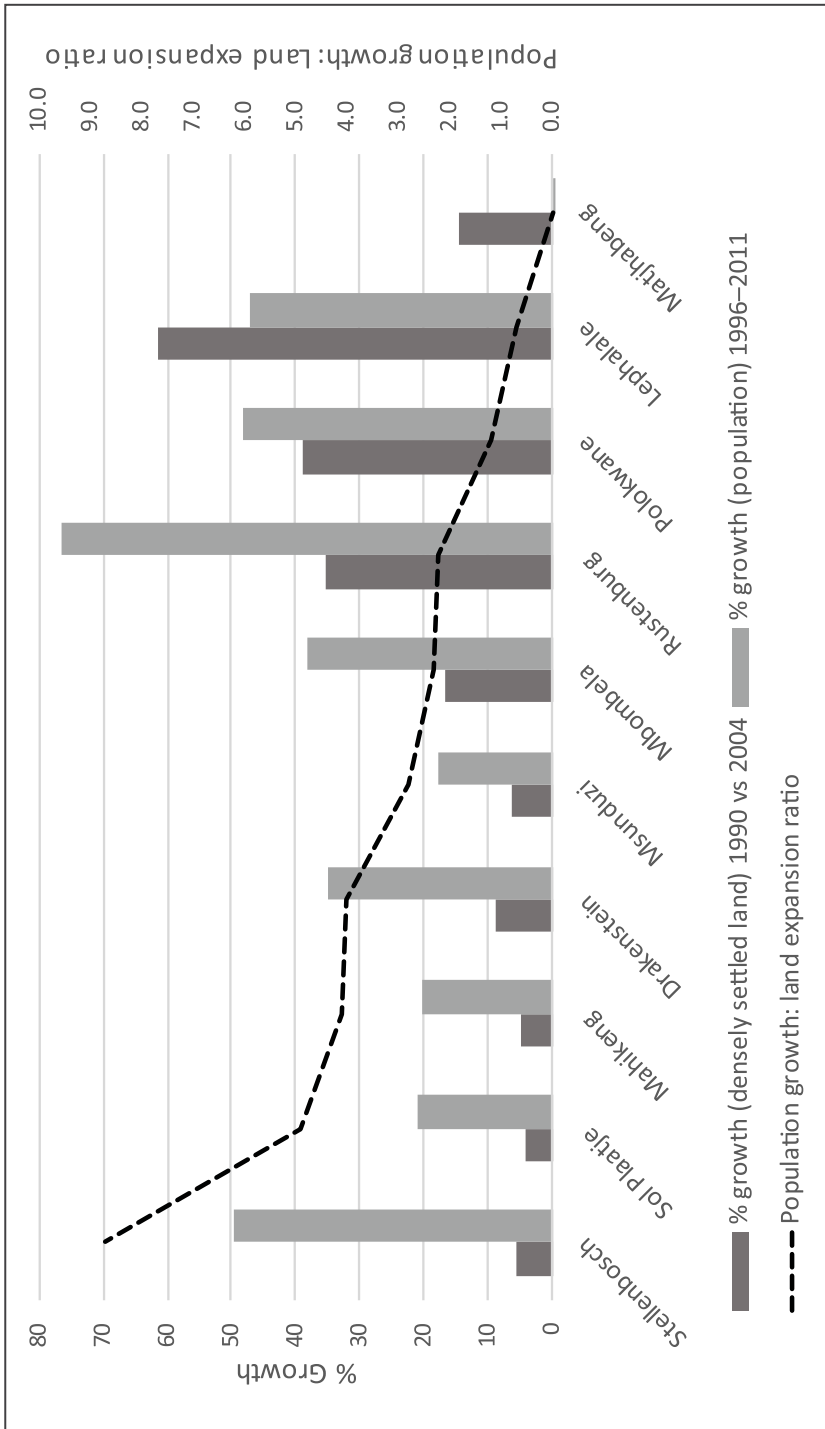
The SDF interprets 'optimal land use' as adhering to the principles of mixed land use development, limiting the expansion of the urban footprint and promoting higher development densities supported by a strictly maintained urban edge. One of the principles that is intended to help practically achieve this objective is to use publicly owned land to maximise opportunities for mixed use and mixed housing type development. The preferred location for new development is close to public transport hubs, and brownfield sites are preferred to greenfield. Priority is to be given to satisfy the growing need for affordable housing and incrementally upgrading the informal settlements. The SDF recognises Stellenbosch University's critical role in the spatial development of the town and the importance of integrating plans for its expansion into the municipal spatial plans. The municipal IDP mentions some concerns about the university's expanding footprint, particularly in the form of student accommodation encroaching on the suburbs (Stellenbosch LM 2017a).

The respondents generally agreed that restrictions on development beyond the urban edge from 2012 to 2017 have helped to maintain the urban footprint and that the stronger focus on infill development have contributed to some densification. Some, however, noted that potential infill projects on strategically located land, and at a scale where they could make a meaningful contribution to spatial transformation, have not progressed beyond the conceptual stage and were not being vigorously pursued. They said national and provincial governments were not helping to implement projects of this kind and that, despite the intentions expressed in the SDF, the council had apparently failed to curtail the growth of informal settlements or to satisfy the demand for lower- and medium-income housing. They said the council had not managed student housing effectively by aligning it with infrastructure capacities and constraints.

The realities of spatial development in the town of Stellenbosch over the past decade and more show that some elements of the policy's intention are being realised and that respondents' perceptions are accurate. The growth of the town

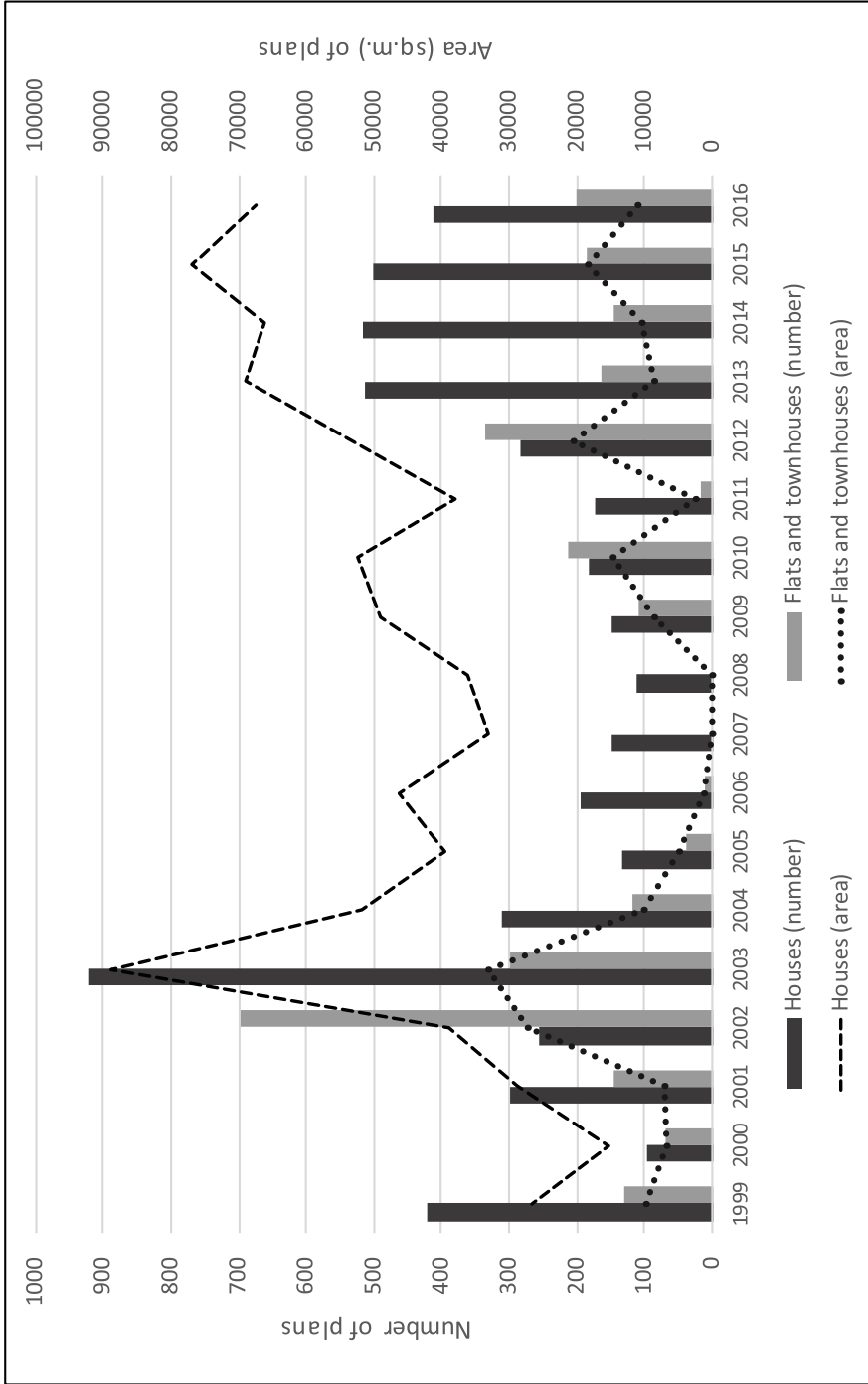
between 1990 and 2013/2014 as shown in Figure 12.1 clearly indicates that this growth occurred mainly inside the identified edge of the town, signifying the way the edge influences the urban development pattern. Moreover, the extent of the urban footprint of the entire Stellenbosch Municipality increased by only 5.7% between 1990 and 2014 while population growth over the period 1996 to 2011 was as much as 49.7%. Although it can be argued that in the case of the town of Stellenbosch this population growth is partly due to the growing student population; it does indicate a pattern of broad overall densification, with the ratio between population growth and land expansion being 8.7 to 1. Figure 12.2 shows that this ratio for Stellenbosch is the highest by a large margin in the selection of ten secondary cities in this volume.

However, a study of changes in building density in the town specifically (Musakwa & Van Niekerk 2015) showed a different view of the apparent progress with densification as implied by Figure 12.2. This study found that an increase in high-density cover, i.e. more than ten building units per hectare, is concentrated in only a few areas and is not a widespread phenomenon across the town. Moreover, very few of these areas of significant increase in building density are around the railway and bus stations and major roads and intersections, as intended by the SDF. The number and area of residential building plans passed in Stellenbosch LM also showed that single dwelling houses were the dominant form of residential development over the period 1999 to 2016. Given the development intention to increase densities and optimise infill opportunities, one would expect to see a preference for higher density residential development in the form of flats and townhouses. Figure 12.3 shows instead an increased focus on individual houses.



Source: SACN (2017)

FIGURE 12.2 Growth of densely settled land and population



Source: Own calculations based on Quantec (2018)

FIGURE 12.3 Area of residential building plans passed in Stellenbosch municipality, 1999–2016

The respondents' perception that the council, through its SDF planning process, is unable to manage the growth of informal settlements and satisfy the demand for lower- and medium-income housing in Stellenbosch, is supported by the analysis of statistical information. These show the continued increase of informal housing in both absolute and proportional terms. According to the 1996 census and the 2016 community survey (Stats SA 2016), the number of households living in informal dwellings increased from 3 543 in 1996 to 17 936 in 2016, a proportional increase from 13.7% of total housing in 1996 to 34.2% in 2016. The latter figure is the second highest of 25 secondary cities in South Africa and implies that one in every three households in Stellenbosch LM lives in an informal dwelling.

The increasing role and influence of Stellenbosch University in the spatial development of the town can be seen in the growing student numbers, almost doubling from below 15 000 in 1990 to 31 627 in 2017, with a permanent staff of 3 429 (Stellenbosch University 2018). This growth has caused problems for spatial development, especially with the expanding footprint of the town, student accommodation encroaching on the suburbs, traffic volume increasing, and pressure being placed on infrastructure capacity (Stellenbosch Municipality 2017b). A study of student housing in Stellenbosch showed large numbers of students living in suburbs north of the CBD, causing properties to be rezoned from single residential to student housing. In the suburb of De Weide, 51% of students were living in houses with between six and ten occupants, and a further 22% with between 11 and 15. The average number of vehicles recorded per house was eight (Donaldson et al. 2014). When interviewed, as much as three-quarters of the permanent non-student residents of the same area said they had been in conflict situations with students mainly due to noise, public drunkenness, house parties and parking infringements. Despite the existence of appropriate zoning categories for student housing, the suburbs have experienced dramatic changes to both the social and the built environment as a result of 'studentification' (Donaldson et al. 2014).

12.4.2 Inclusive economic growth

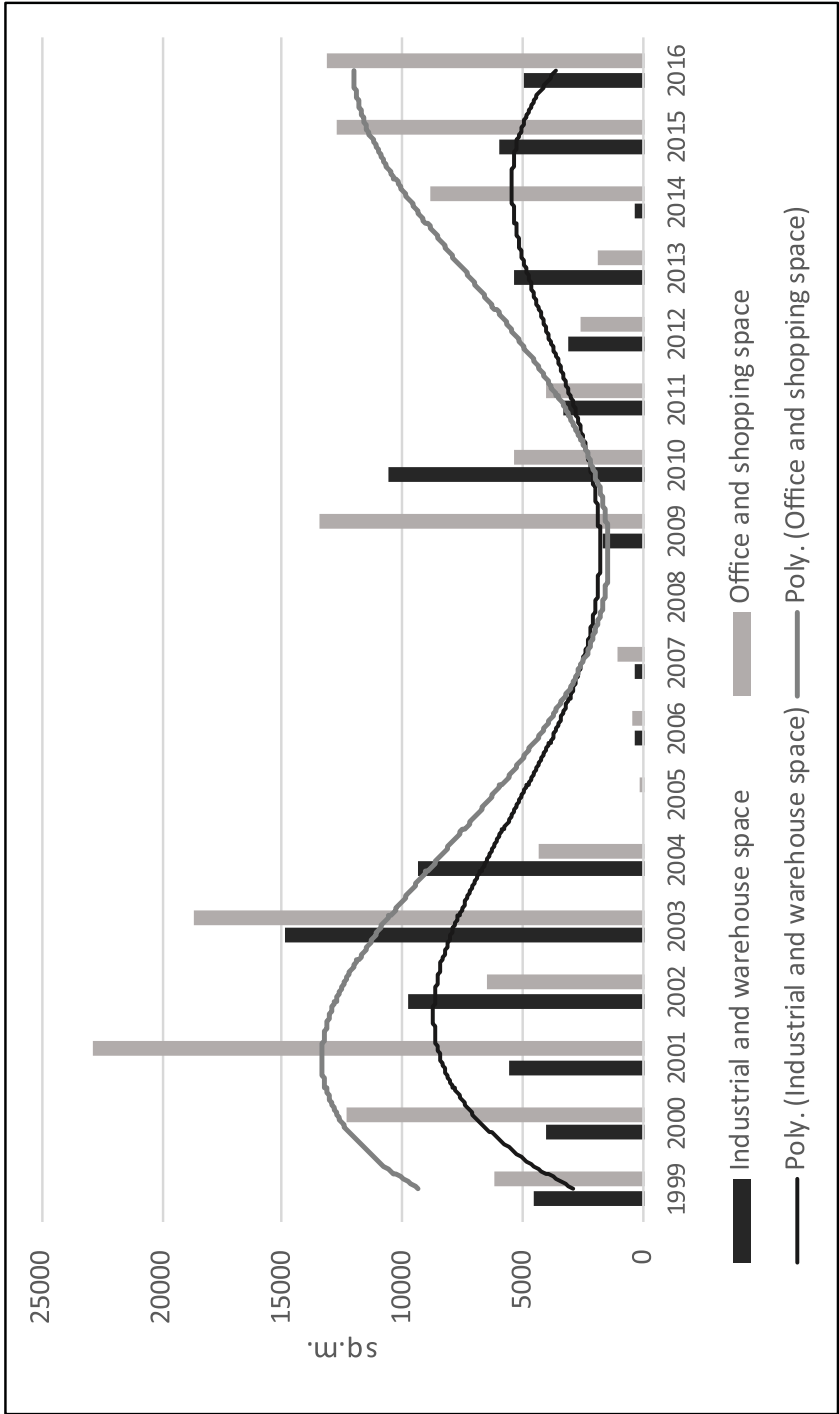
The SDF recognises the imbalances between rich and poor in Stellenbosch. It recommends the provision of a proportional balance of low-, middle- and high-income housing, with housing for the less affluent being provided closer to economic opportunities, and commercial zones being created close to low-income suburbs. The SDF further recognises the requirements of the informal sector and proposes that shopping centres and areas with high pedestrian traffic should include market areas and sidewalk opportunities to help informal traders access more business. It further recommends, as one of its principles, that informal retail locations should be provided on sidewalks and verges and median areas (spaces that separate lanes of traffic on divided roadways to cater for permanent traders). It proposes that key centres should provide informal, properly managed farmers' markets selling fresh produce and arts and crafts (Stellenbosch LM 2017b). It identifies the growth of Stellenbosch University as a major opportunity for the property and services sectors and a driver of inclusive economic growth.

Although the respondents generally agreed that the urban edge was successful in limiting urban sprawl and contributing to densification, the opinion was, however, also expressed that the strict application of the defined urban edge had the negative effect of limiting proposed new development and associated economic growth opportunities. Another perception was that although the SDF made a number of far-reaching proposals for dealing with the informal economic sector, most of these remained principles only, without clearly implemented and demonstrable projects and strategies. Respondents also noted a change towards a knowledge and services economy and pointed to the role of Stellenbosch University in this process.

Stellenbosch LM's local economy has undergone fundamental changes over the past two decades, with the most notable change being the decline of the agricultural sector as a source of employment, down from nearly 15 000 formal employment opportunities in the early 1990s to less than half that figure in 2016 (Quantec 2018). The manufacturing sector has also continued to shed employment. The biggest growth has been in the tertiary sector, particularly

in financial and business services and in trade and accommodation. The spatial manifestation of some of these changes is also reflected in the size of building plans passed. Figure 12.4 shows that the size of industrial and warehouse building plans has generally been well below that of office and shopping plans. The size of building plans passed for office and shopping space peaked over the period 2001 to 2003 and can probably be largely attributed to early developments in the Technopark office park. Thereafter the effects of the 2007/2008 global financial crisis are clearly reflected in the building statistics, but signs of recovery are visible, especially since 2013. Similar trends were also identified by Musakwa and Van Niekerk (2013), who found that the extent of commercial and office land use increased by 27.6% and 17.4%, respectively, between 2000 and 2010, while the extent of industrial land use increased by only 8% over the same period.

The SDF strongly emphasises the provision of space and facilities for the informal sector as part of the strategic objective of inclusive economic growth. This is understandable given the growth of the informal sector both in absolute and proportional terms. The total number of informal sector employment opportunities (excluding agriculture) in Stellenbosch LM increased from 3 324 in 1993 to as much as 20 118 in 2016, with formal sector employment registering only moderate increases over the same period (Quantec 2018). The contribution of informal sector employment as a proportion of total employment thus increased hugely from 8.2% to 30% over this period. But despite the growing importance of the informal sector as a source of employment, the relevant policy and planning framework documents make very few references to the informal sector and its value and role in local economic development in Stellenbosch (Tshofuti 2016). Despite the SDF's intention of supporting informal businesses and various budget line items included in the municipal IDP for creating informal trading facilities, very little has been accomplished to date in terms of creating a coherent strategy for developing viable spaces for informal trading (Hillyer 2018).



Source: Own calculations based on Quantec (2018)

FIGURE 12.4 Area of industrial and office and shopping building plans passed in Stellenbosch Local Municipality, 1999–2016

Residential transfer figures show that little progress has been made in realising the SDF's intention of providing a proportional balance of low, middle and high income housing, with the lower end situated closer to economic opportunities. Statistics for residential transfers per price band between 2005 and 2015 show that the proportion of transfers in the lowest price band (below R160 000) have increased considerably, especially since 2013, mainly because of the high number of transfers in this band in Klapmuts and Kayamandi. However, the proportion of transfers roughly equivalent to the GAP housing market (R160 000 to R580 000) showed very little proportional increase and remained at around 5% of transfers.⁷ Moreover, the majority of property transfers across the entire period were still in the highest price band, above R1,5 million (Rode & Associates 2017). There is thus little evidence that a more balanced mix of low-, middle- and high-income housing is being achieved, or that progress in this regard is being made.

12.4.3 Resource custodianship

The SDF notes that climate change is likely to bring a combination of rising temperatures and reduced or erratic rainfall, placing pressure on the municipality's water supplies. Stellenbosch's water supply infrastructure is already struggling to deliver uninterrupted potable water to its constituents. Besides potable water, the SDF highlights other water-related matters that require attention: wastewater, solid waste, energy and construction materials. This study looked at the issues of potable water and wastewater. The SDF emphasises the need to protect indigenous riverine ecosystems and eradicate alien vegetation. It says peak water demand should be accommodated with supplementary water storage and recycling, and urban water conservation and demand management programmes should be implemented. Waste water treatment works must be upgraded to achieve minimum water quality

7 'Gap housing market' refers to households that typically earn between R3 500 and R15 000 per month, which is too little to enable them to participate in the private property market, but too much to qualify for state assistance.

standards and, where feasible, development at new settlement nodes should be serviced by localised wastewater treatment plants that use appropriate sustainability-oriented technologies (Stellenbosch LM 2017b).

The respondents were of the opinion that the SDF has succeeded in raising awareness of the need to protect natural resources, and in particular they credited it with helping to protect and improve river corridors and implementing projects to do this. They said the SDF had contributed to more efficient use and management of water resources through initiatives such as training and awareness campaigns and the installation of new water meters. They said that, although not fully adequate, some improvements have been made to the bulk infrastructure capacity constraints, most notably the upgrading of the wastewater treatment plants in Stellenbosch LM. They noted a much stronger focus on aligning the prioritisation and funding of bulk infrastructure with the policy of densification and the identified urban edges. But some said that although progress has been made with improving the capacity of wastewater treatment plants, other problems in the water, sewerage and electricity networks remain and are hampering potential new developments in certain locations.

The municipal IDP shows that Stellenbosch LM has indeed managed to realise large water savings since 2015. From July 2015 to June 2016 the saving was generally less than 10% below the consumption figure for the baseline period (July 2014 to June 2015). However, between July 2016 and June 2017 the saving increased to between 10% and 20% below the baseline and by the end of 2017 it was more than 40% below the baseline (Stellenbosch LM 2018). The municipality also managed to reduce the use of non-revenue water to 21.7% of the input volume into the potable water system in the 2016/2017 financial year (Stellenbosch LM 2018).⁸ This figure is well below the national average (based on data for 132 municipalities in South Africa) of 37% of system input volume for non-revenue water (Bhagwan et al. 2014).

8 'Non-revenue water' usage includes unbilled metered, unbilled unmetered, informal areas not metered, losses in bulk supply system, apparent losses and real network losses.

The latest Green Drop progress report of the Department of Water and Sanitation describes the condition of municipal wastewater treatment plants. The report shows that Stellenbosch LM is one of the two highest risk municipalities in the Western Cape, with all its six wastewater treatment plants being categorised as high risk, particularly with regard to the lack of flow measurement at the plants, lack of supervisory and maintenance skills, and lack of effluent compliance (RSA Department of Water and Sanitation 2014). In response to these challenges, significant progress has been made in improving the capacity of these plants, specifically in the town of Stellenbosch.

12.4.4 Promotion of agriculture and food production, and preservation of heritage

The SDF recommends that land outside existing or proposed urban settlements should be used only for agricultural production, biodiversity conservation, scenic quality and agritourism. It strongly discourages further subdivision of that land or low-density urban development on agricultural land. The SDF notes that the agricultural industry has experienced difficulties in attracting capital as high premiums are paid for the lifestyle aspects of Stellenbosch farmland, resulting in increasing property prices and lower financial returns for farmers (Stellenbosch LM 2017b).

Stellenbosch LM (2014) contains some of the country's highest yielding agricultural land. Approximately 40% of its total land area has been modified by cultivation. Although agricultural land dominates the landscape, in 2016 it accounted for only 12.4% of formal sector employment and 5.5% of its GDP (Western Cape Government Provincial Treasury 2017) with some areas actually experiencing food insecurity (Kelly & Schulschenk 2011). A total of 249 ha of Stellenbosch LM's agricultural land was converted to urban uses between 2000 and 2010 (Musakwa & Van Niekerk 2013).

The rich cultural and scenic heritage of Stellenbosch gives it its unique character and ambience (Stellenbosch LM 2017c). The SDF supports tourism if it reinforces the municipality's sense of place. This is particularly the case with wine tourism. The Stellenbosch Wine Route is one of South Africa's

most famous wine routes, attracting more than 800 000 visitors annually (Ferreira 2017). Recent research emphasised the importance of maintaining the authenticity of the Stellenbosch wine route and not overdeveloping or over-commercialising it (Ferreira & Hunter 2017). Balancing the need for new development with the need to maintain the rural and historical heritage character and sense of place of the town of Stellenbosch and the municipality has been identified as one of the municipality's main spatial development challenges. The SDF proposes several principles for protecting character and heritage, including using guidelines for sensitive biodiversity areas, restricting building heights and maintaining suitable architectural styles along major roads, determining appropriate land use zoning according to view sheds⁹, and encouraging appropriate tourism.

12.5 Conclusion: Complexity in spatial planning for Stellenbosch Municipality

This chapter's evaluation of intentions and realities does not claim to be comprehensive. Nevertheless, the respondents' opinions and anecdotal evidence do give a fairly accurate picture of spatial changes that have successfully realised the intentions of the SDF and some that have been less successful.

Some degree of success in achieving the SDF's strategic objectives has been seen in the way maintaining the urban edge has limited the expansion of the urban footprint of both the town of Stellenbosch and the broader Stellenbosch and increased municipal population densities. But there are no clear signs of an increased focus on and preference for higher density forms of residential development such as flats and townhouses. The structure of the economy has been changing rapidly since the early 1990s and the town has managed to accommodate the increasing dominance of and requirement for office and shopping space over industrial and warehouse space. The SDF has helped to raise awareness of the need to protect natural resources, in particular

9 A 'view shed' is the geographical area visible from a specific location such as an enclosed valley.

river corridors. Stellenbosch LM has realised large water savings since 2015 and reduced the proportion of non-revenue water to well below the national average. From a tourism perspective, the Stellenbosch Wine Route has established itself as a trendsetter among South African wine routes and is attracting large numbers of visitors annually, to the extent that the wine tourism industry has to work to maintain its authenticity and guard against overdevelopment or over-commercialisation (Ferreira & Hunter 2017).

Other strategic objectives of the SDF have been less successfully realised. The increase in overall density is uneven. It is concentrated in a few localities and there is little sign of new urban development being aligned with the railway and major roads or focused on train and bus stations and road intersections, as intended by the SDF. There has been no noticeable shift towards the use of public transport and non-motorised transport. The SDF planning process has not been able to manage the growth of informal settlements or satisfy the demand for lower- and medium-income housing in the town and the broader Stellenbosch LM. Informal housing is growing in both absolute and proportional terms to the extent that one in every three households in Stellenbosch LM now lives in an informal dwelling. Only limited progress has been made in realising the SDF's objective of a proportional balance of low-, middle- and high-income housing, with housing for the less affluent being provided closer to economic opportunities. It has also not been able to cope with the effects of Stellenbosch University's expansion, especially with regard to student accommodation and the way that 'studentification' in some suburbs is affecting the social and built environment. Despite the growth of the informal sector in the town and the Stellenbosch LM, and the SDF's intention of supporting informal businesses, very little has been accomplished to date in terms of creating a coherent strategy for developing viable spaces for informal trading.

These varying levels of success in achieving spatial change in line with the intentions of the SDF highlight the interconnected nature of the key issues at hand. A fresh perspective is needed on some fundamentals of spatial planning, especially the need for a systemic approach as espoused in some of

the concepts of complexity in planning and complex adaptive systems. Many of the issues influencing spatial change in Stellenbosch require a relational view of space, recognising interactions at multiple scales. It is thus important to stretch the spatial planning effort beyond mere municipal administrative boundaries to also consider shared environmental resources and regional economic interdependencies such as commuting patterns and a shared consumer catchment area. For example, a spatial development drive that focuses on public transport systems and nodes and increased use of public transport cannot realistically be achieved solely within the confines of the local administrative boundary.

The interactions between the various components of the Stellenbosch urban system operate at different speeds over multiple spatial scales, and different components of the urban system change over different timescales. Some of the components, such as the local economic structure and the urban footprint, operate at a larger scale and change relatively slowly. The spatial pattern of the formal economic sector changes at a regional and municipal scale and over a timescale measured in years or decades. Conversely, the location and operation of the informal sector can vary on a daily basis in response to factors such as pedestrian traffic volumes and patterns, and changes in optimal location can vary over a timescale of days or weeks. Policy and regulations that affect the informal sector can thus not be conceived and implemented in the same way and on the same timescale as formal sector economic policies. The impact of scale on the interpretation of spatial trends is also evident in dimensions such as development density, which may reflect a particular trend at municipal scale, but with very different and more nuanced patterns at a smaller local scale.

This implies a change in the mode of thinking in spatial planning from the assumptions of rationality and absolute space and time to a mode that promotes learning and relationship building and where planning is founded on collective understandings of space and time. This does not necessarily imply a disregard for quantitative and statistical reasoning and a narrow focus on communicative processes only. It implies using a combination of tools

and techniques to facilitate a better understanding of the complex causality within the local urban system nested in interrelationships with other systems at various scales. This requires interventions in the physical environment that are not limited to the timescales required by regulatory spatial planning processes but that take into account the broader urban system, which involves patterns and progress over multiple timescales.

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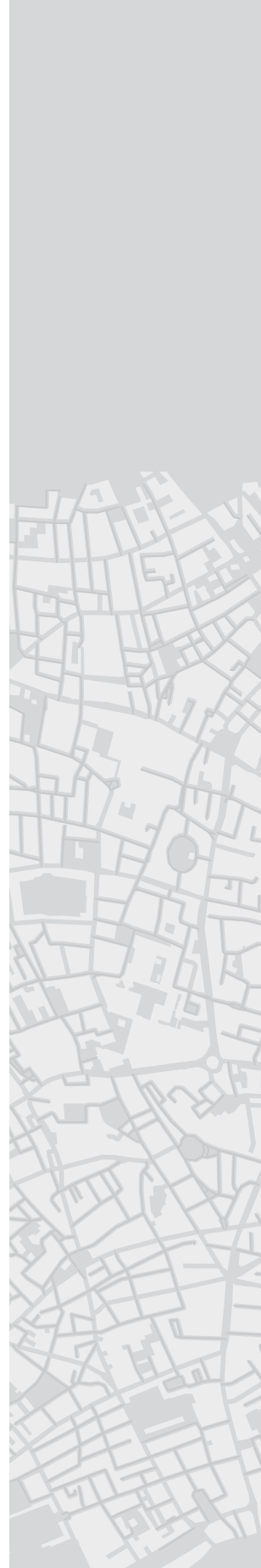
CHAPTER 13

COMPLEXITY THEORY AND SPATIAL CHANGE IN TEN SECONDARY CITIES

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13.1 Introduction

Ten case studies of spatial change and spatial planning in South African secondary cities are featured in this book. We aimed to gain a better understanding of the complex environment in which decisions were made. In Chapter 1, we set ourselves the task of answering six questions about understanding spatial change and spatial planning within this framework. These questions were:



- Do these cities' spatial transformation policy proposals consider the complexities of spatial planning for a secondary city?
- Are there contradictions between these cities' policies and their application of the policies?
- How do these cities plan for uncertainties, disruptions or slow change?
- How do these cities' local plans and priorities currently affect the key indicators of spatial transformation?
- How do interest groups influence spatial planning in these cities and what are the intended and unintended consequences of their influence?
- Are there unintended consequences of these cities' drive towards spatial transformation?

Using our ten case studies, we answered these six questions. Although the authors of the case studies have each already reflected on some of the issues pertaining to complexity in planning, in this chapter we return to a more detailed discussion of the questions. In the sections that follow, the questions are not answered strictly in the order in which they are presented above, because of many overlaps between the issues.

13.2 Understanding spatial change in the ten cities

In Chapter 2, we emphasised the importance of understanding complexity despite the absence of a precise definition. Complexity in planning is the result of many things. For example, a variety of actors, with conflicting views and goals, often contribute to a reality that is in a state of flux, a situation that leads to contradictions, or non-linear outcomes, that further increase the complexity. We emphasise the lack of approaches and methods that can take cognisance of such complexities. Our ten case studies explain these complexities and show how difficult it is to respond to these complexities. The book illustrates that the simplistic targets and spatial change indicators that government pursues through policy and practice, might be inappropriate within diverse contexts. For example, central to a South African vision of

urban space, is the intent to prevent sprawl and improve densities (and that means not just increasing the number of people per square kilometre but also improving living conditions in the densified areas). Our evidence from the ten case studies shows that preventing sprawl and increasing densities reflect a one-directional approach. In Chapter 1, however, we observed that the planning approach in South Africa has loosened up since the early 1990s. Under the colonial and apartheid dispensations, the government was the main decision-maker and exercised control. Now, these tight controls have been relaxed somewhat and the government has become more flexible regarding land use. However, the assumption remains that government should control development and that it is possible to control all development. More decisions are currently taken at the local level by local governments and individual actors, thereby increasing the range of actors who play a role.

We identified four major elements of spatial change that clearly illustrate the complexity and paradox at play in the ten case study cities: both urban sprawl and densification; sprawl of two kinds, high- and low-income; some infill development; and continued spatial segregation. Table 13.1 shows evidence of the first two elements.

First, it shows that both sprawl and densification have occurred in most of the cities. The areas of all the settlements in these cities are larger in 2014 than they were in 1990. At the same time, however, there are patterns of densification. Between 1996 and 2011, the population growth outstripped the growth in the size of the settlements in eight of the ten case study cities. The largest increase in density has been in Stellenbosch, where population growth has exceeded settlement expansion by a ratio of 9 to 1. Drakenstein, Mahikeng and Sol Plaatje also have high ratios, of more than 4 to 1. The exceptions are Lephalale and Matjhabeng, where settlement growth has outstripped population growth. Mining has been one reason for the sprawl in these two cities. In Matjhabeng the sprawl has been driven by three factors: retrenched mineworkers have moved to the informal settlements, miners have been given a living-out allowance rather than being housed in compounds, and the government has deliberately introduced low-income housing programmes, such as the Strategy for the Revitalisation of Distressed Mining Areas.

TABLE 13.1 Growth of densely settled land in ten secondary cities, 1990 and 2014

Municipality	1990 (ha)	2014 (ha)	Growth (ha)	Percentage growth (land) 1990–2014	Percentage growth (population) 1996–2011	Population growth: Land expansion ratio
Drakenstein	4 087	4 443	356	8.7	34.8	4:1
Lephalale	3 748	6 055	2 307	61.5	47.1	0.7:1
Mahikeng	20 839	21 870	1 031	4.9	20.3	4.1:1
Matjhabeng	9 289	10 647	1 358	14.6	-0.14	-
Mbombela	24 081	28 054	3 973	16.5	38.2	2.3:1
Msunduzi	22 012	23 421	1 409	6.4	17.9	2.8:1
Polokwane	30 596	42 525	11 929	39.0	48.1	1.2:1
Rustenburg	12 401	16 784	4 383	35.3	76.3	2.2:1
Sol Plaatje	4 560	4 754	194	4.3	20.9	4.9:1
Stellenbosch	2 658	2 810	152	5.7	49.7	8.7:1

Source: SANBI (2014)

Note: The dates for 1990 and 2014 are based on what was available from this source.

Second, the table shows that the nature of sprawl is not uniform. Both high-income and low-income sprawl can be seen in our case study cities. High-income sprawl (often in the form of gated communities) is apparent in Drakenstein (south of the N1), in parts of Msunduzi, in Polokwane, in Stellenbosch and in Rustenburg. The problem with this kind of sprawl is that it increases travel time, the cost of providing municipal services and the costs for low-income workers who have jobs in these areas. Low-density sprawl occurs in all the case study cities – even where negative population growth has been experienced, as in Matjhabeng. In many cases, the relaxation of land use control has allowed a larger number of actors to respond in diverse ways,

with informal settlement formation being a prominent example. Low-income sprawl is driven by many factors: informal land invasions, the government's low-income housing programme, the fact that housing delivery is the main response in the Strategy on the Revitalisation of Distressed Mining Areas, the presence of traditional land that lends itself to haphazard occupation, and the fact that many mineworkers (especially in Rustenburg) settle informally near mining shafts.

Third, in contrast to sprawl, there are also examples in these cities of effective infill developments that have almost filled the apartheid buffer strips. In practical terms, settlement expansion takes place on the land between historical settlements. The development between Seshego and what is today known as Polokwane City is the best example of filling a gap between former black townships and former white suburbs. Other examples of infill development can be seen in Drakenstein between the former black townships of Paarl and Wellington, in Matjhabeng between Odendaalsrus and Kutlwanong, and in Rustenburg.

Fourth, despite government intent to address the historical spatial problems, the case studies also show the continuation of the spatial marginalisation created under apartheid. In Lephalale and Mbombela, for example, settlement continues behind the old homeland boundaries. In many cases, the large distances separating these places from the main urban areas mean that the communities are dislocated from the main economies. It may well be that these marginal places have themselves also started to play a different functional role and that their need for connectivity even transcends municipal boundaries. For example, it is likely that many people in the marginal places work outside the boundaries of the municipality they live in and only visit that municipality occasionally. Yet in some of these places, large housing investments take place and households often see this as an investment destination. Overall, our assessment shows that policy makers should be careful not to make simplistic assumptions about these places and that it requires at least a proper understanding of the specific places.

Finally, we must note that not all sprawl is bad and higher densities are not necessarily always positive (Todes et al. 2018). Some sprawl is unavoidable, to satisfy the demand for housing. The problem is that in many of our case study cities it is low-density sprawl. However, policies aimed at promoting higher densities can have unintended consequences; for example, in Stellenbosch and Drakenstein higher densities have led to exclusion by making land unaffordable for low-income families.

13.3 Contradictions between policy intentions and actual results

Chapter 1 outlined the rationale and development of spatial planning since the apartheid period. The liberal response that was largely incorporated into the post-apartheid thinking emphasises higher densities and mixed land uses. But despite the declared national intention to increase urban densities, the programmes of national and provincial governments sometimes actually cause low-density urban sprawl and other problems.

We discuss three examples. First, the Housing Subsidy Programme (a programme implemented by the provinces) has in some cases resulted in sprawl, for example in Matjhabeng and Msunduzi. However, in others the result has been infill development. In Matjhabeng, the apartheid buffer strip between Odendaalsrus and its former township Kutlwanong is a good example, as is the already mentioned Seshego case in Polokwane. In Sol Plaatje, the result of this programme is that the municipality is struggling with the pressure to provide bulk infrastructure. The complex nature of intergovernmental relations is one of the main reasons why local municipalities find it difficult to plan for land development when it is associated with national and provincial government programmes.

Second, changes in the policies governing mineworker housing have contributed to the proliferation of urban sprawl, which is an unintended outcome of policy. Government policies dating from around 2000 dictated that the compounds should be either converted to single or family units or demolished. Mineworkers were given living-out allowances, which many

used to find accommodation in sprawling low-income informal settlements. In Rustenburg, this move was facilitated by the availability of large tracts of traditional land in the area. A further aggravating factor is migrant labour, which continues today, although no longer legally enforced. The lower-paid workers in underground mines, for example in Matjhabeng's gold and Rustenburg's platinum mines, are more likely to be migrants than the better-paid workers in open-shaft, mechanised mines, as for example in Lephalale's coal mines. The contradiction here is between the government's intention to improve mineworkers' living conditions and the resulting worse conditions in sprawling unplanned settlements (Marais & Venter 2006).

A third example of contradiction can be seen in the unintended consequences of the urban edge policies as required by post-apartheid spatial policy. Applying a strict policy for maintaining the urban edge creates a scarcity of land for urban development and is likely to contribute to higher densities that are not necessarily beneficial. These policies have been applied rigorously in Drakenstein and Stellenbosch. In the former, especially, the application of the urban-edge policy has pushed up property prices and severely reduced the amount of land available to low-income households. These unintended effects of urban edge policy may have been among the factors contributing to greater exclusion and lower levels of racial integration in Drakenstein and Stellenbosch (see Table 13.2).

TABLE 13.2 Racial desegregation in ten secondary cities compared with the metropolitan areas of South Africa, 1996 and 2011

City	Total wards	Number of wards with >50% of people classified white by census		Percentage of wards with <50% of people classified white by census		Percentage change 1996–2011
		1996	2011	1996	2011	
Drakenstein	31	4	4	12.9	12.9	0
Lephalale	12	2	0	16.7	0	100
Mahikeng	31	0	0	n/a	n/a	n/a

COMPLEXITY THEORY AND SPATIAL CHANGE IN TEN SECONDARY CITIES

City	Total wards	Number of wards with >50% of people classified white by census		Percentage of wards with <50% of people classified white by census		Percentage change 1996–2011
		1996	2011	1996	2011	
Matjhabeng	36	7	0	19.4	0	100
Mbombela	39	4	4	10.3	10.3	0
Msunduzi	37	4	1	10.8	2.7	75
Polokwane	38	5	1	13.2	2.6	50
Rustenburg	38	5	3	13.2	7.9	40
Sol Plaatje	31	4	2	12.9	6.5	50
Stellenbosch	22	7	6	31.8	27.3	14.3
Average of ten cities	284	42	21	14.2	7.0	42.9
Metros	710	163	110	23.0	15.5	26.4

Source: Stats SA (1996, 2011)

Note: The 1996 and 2011 censuses use the figure of over 50% of white people in a ward to measure the extent of racial desegregation in that ward.

Table 13.2 shows that residential desegregation, according to the census definition, which is arbitrarily based on the percentage of white residents in a ward, is substantially higher in the ten case study cities than in the metropolitan areas of South Africa. This can be deduced from the fact that in 2011 only 7.4% of the wards in these cities had more than 50% white residents. The corresponding figure for the metropolitan areas is 15.5%. A more specific indication is that whereas these cities saw a 42.9% decrease in the percentage of wards with 50% or more white residents, the corresponding decrease in the metros was only 26.4%. However, the two cities with strict urban-edge policies, Drakenstein and Stellenbosch, are the two with the lowest levels of desegregation. Polokwane, unlike the other cities, has had a high level of urban desegregation since the mid-1980s (Donaldson & Kotze 2006).

Though, in all likelihood, lower-than-average house prices have been responsible for the pattern for the ten cities shown in Table 13.2, cultures and environments specific to the particular cities may also have encouraged or discouraged desegregation. It seems that a strict urban-edge policy might contribute to continued segregation although this relationship requires a more detailed investigation. In many secondary cities, racial desegregation is a powerful tool for spatial transformation. It makes access to job opportunities, businesses and social amenities such as schools and medical facilities much easier for substantial portions of the population. Although the evidence of desegregation as seen in Table 13.2 is probably not yet an indication of the existence of a non-racial middle class, it does provide evidence of a larger degree of racially integrated suburbs in intermediate cities. Demographic change in the form of desegregation (mostly blacks moving into former whites-only spaces) does not affect spatial form as such, but it does affect the way a space is filled, which may in time lead to different uses of the space, thus affecting future planning.

13.4 Uncertainties, disruptions and slow change

Uncertainties, disruptions and slow change are endemic to complex systems. Effectively, we live in an uncertain world. While some change is bound to be rapid and disruptive, most change is slow and evolutionary. The uncertainty that mostly plagues our ten case study cities is the vulnerability of their economies, as can be seen from the indicators in Table 13.3. Their economic growth is substantially lower than that of the metros and the economic structure of many of them is, either directly or indirectly, linked to the primary sector or a single sector (Marais et al. 2016). Many are directly dependent on mining and agriculture. Vulnerability is often associated with a lack of economic diversification and a larger dependence on mining. Those that do not depend on mining, like Drakenstein, Msunduzi and Stellenbosch, are generally less vulnerable.

TABLE 13.3 Economic size, economic growth and economic structure in ten secondary cities, 1996–2015

City	Total GVA 1996 (R000 000) in 2010 constant values	Per capita GVA 2015 (R000 000) in 2010 constant values	GVA growth per annum 1996–2015	GVA growth per annum 2011–2015	Mining as percentage of economy (2015)	Primary sector as percentage of economy (2015)	Secondary sector as percentage of economy (2015)
Drakenstein	14 074	50 264	2.7	2.2	0.2	7.6	23.5
Lephalale	8 336	59 542	2.7	−0.6	37.1	40.5	29.1
Mahikeng	13 437	42 657	2.7	2.2	0.4	1.4	10.3
Matjhabeng	31 360	72 930	−0.2	1.3	42.1	43.4	11.4
Mbombela	30 052	48 083	2.7	1.8	2.4	5.4	18.4
Msunduzi	36 297	53 377	3.0	1.8	0.6	3.2	25.5
Polokwane	34 754	49 648	3.8	1.9	0.6	1.5	11.5
Rustenburg	54 650	86 748	1.8	−1.6	59.4	60.1	8.7
Sol Plaatje	14 914	58 484	1.9	1.1	10.5	11.5	9.3
Stellenbosch	10 460	59 771	2.9	2.0	0.2	6.5	21.7
Average per city	23 630	55 070	2.4	1.3	14.0	16.6	16.2

Source: Quantec (2016)

Table 13.3 shows that in 2015 mining contributed more than 10% to the economy of four of the ten cities (Rustenburg 59%, Matjhabeng 42%, Lephalale 37% and Sol Plaatje 12%). These four are also with the lowest

overall economic growth rates over the 20-year period (1996–2015), despite Lephalale and Rustenburg having had very high economic growth rates at specific stages during this period. The three cases of negative economic growth shown in the table also happen to be related to cities dependent on mining, Lephalale, Matjhabeng and Rustenburg. Periods of strong economic growth followed by periods of decline are common in the mining-dependent cities and these periods are often accompanied by social disruption (Marais 2013). The direct consequences of mining are often seen in the growth phase of mining. New housing and land are required to accommodate increases in mineworker numbers, Lephalale being a good example of this. In many cases, the municipalities are unable to plan for this in-migration in advance, and informal settlement development is often the result.

Mining decline also has major direct implications for settlements. In both Matjhabeng and Sol Plaatje, mine-owned land forms part of the urban settlements. The presence of old mine dumps on land adjacent to the mines is often counterproductive in respect of both spatial transformation and achieving higher densities.

Secondary cities are also vulnerable because of their own financial problems and struggle to remain financially viable. To increase their income from rates and taxes, struggling municipalities sometimes allow new developments that fall outside the framework provided by the SDF.

Tables 13.4 and 13.5 provide overviews of municipal finance in the ten case study cities, showing evidence of financial vulnerability.

TABLE 13.4 Municipal income indicators for ten secondary cities

City	Total income	Total own income	Property tax per resident per annum	Total property tax	Total sale of services	Property tax as percentage of own income	Property tax: Service fees ratio	Grants	Urban: rural ratio	Nature of rural land
Drakenstein	1 586 081 223	1 391 560 269	692	193 848 747	1 058 874 024	13.9	01:05.5	194 520 954	85:15	Commercial agri-culture, traditional
Lephalale	400 189 050	227 740 916	300	41 948 076	163 774 408	18.4	01:03.9	172 448 134	40:6	Commercial agri-culture, traditional
Mahikeng	521 385 437	338 848 139	451	142 189 789	133 277 015	42.0	01:0.9	182 537 298	22:78	Traditional
Matjhabeng	1 876 769 435	1 290 422 063	448	192 549 129	942 577 378	14.9	01:04.9	586 347 372	98:2	Commercial agriculture
Mbombela	2 158 741 341	1 316 741 341	537	335 673 587	786 818 762	25.5	01:02.3	842 000 000	28:72	Commercial agri-culture, traditional
Msunduzi	4 290 125 472	3 520 485 375	1 091	742 052 098	2 468 236 938	21.1	01:03.3	769 640 097	75:25	Commercial agri-culture, traditional
Polokwane	2 505 166 149	1 402 375 838	366	256 187 487	927 228 857	18.3	01:03.6	1 102 790 311	41:59	Commercial agri-culture, traditional
Rustenburg	3 689 590 000	2 687 801 000	420	264 534 000	2 085 080 000	9.8	01:07.9	1 001 789 000	68:32	Commercial agri-culture, traditional
Sol Plaatje	1 949 602 029	1 673 659 024	1 900	484 397 277	1 004 894 715	28.9	01:02.1	275 943 005	99:1	Commercial agriculture
Stellenbosch	1 411 088 371	1 183 820 239	1 545	270 378 662	705 713 720	22.8	01:02.6	227 268 132	87:13	Commercial agriculture
Average	1 951 425 692	1 429 376 192	735	280 917 459	958 476 131	21.8	3.5	522 049 500		

Source: RSA National Treasury (2016)

TABLE 13.5 Municipal expenditure in ten secondary cities

City	Total expenditure (R000 000) (2016)	Percentage expenditure on maintenance (2016)	Percentage expenditure on municipal employees (2016)	Expenditure per municipal employee (2016)	Expenditure per resident (2016)	GVA: Expenditure ratio (2016)	Audit outcome* (2016, 2015, 2014)
Drakenstein	1 618	4.5	25.4	852 844	5 779	09:01	Cl, Cl, Cl
Lephalale	409	3.4	29.7	794 221	2 921	20:01	Uf, Uf, Uf
Mahikeng	742	3.6	27.3	876 664	2 353	18:01	D, D, Q
Matjhabeng	2 163	1.2	22.1	911 135	5 030	15:01	NF, D, D
Mbombela	2 114	8.7	21.5	n/a	3 382	14:01	No data
Msunduzi	4 245	3.6	22.1	858 784	6 243	09:01	Q, Cl, Uf
Polokwane	1 689	7.1	20.0	681 200	2 413	21:01	Uf, Uf, Q
Rustenburg	3 496	3.2	16.4	931 715	5 549	06:01	NF, Uf, Q
Sol Plaatje	1 689	7.1	37.3	681 200	6 623	09:01	Uf, Uf, Q
Stellenbosch	1 254	4.4	29.0	1 068 934	7 166	08:01	Cl, Cl, Uf

Source: National Treasury (2016)

*Cl = clean, D = disclaimer, NF = not finished, Q = qualified, Uf = unqualified with findings

Our case studies revealed some concerns about the levying of property tax. Although a more thorough assessment is decidedly called for, it is already clear that much more can be done to improve incomes from property tax. Table 13.4 shows that per capita municipal property tax revenues in three of the four mining cities – Lephallale, Rustenburg and Sol Plaatje – are substantially lower than the average for all ten cities. Levying of property tax is also negatively influenced in cities like Mahikeng that have a high percentage of people living on land managed by traditional authorities. Cities like Polokwane and Rustenburg would do well to increase their portion of own income derived from property tax.

The amounts of the grants received by the ten cities are shown in Table 13.4. Perhaps the important question to ask here is how far these grants, which constitute a fairly high proportion of municipal income, actually help these municipalities to achieve spatial transformation and how they could be used to support the creation of more efficient and just cities.

The percentage of municipal expenditure maintenance also invites some comment (see Table 13.5). Spending 4% to 5% of the municipal budget on maintenance is generally seen as the norm in South Africa. Underexpenditure on maintenance is often an indication that a municipality is experiencing cash-flow problems. Cities that seem to be underperforming in this regard are Matjhabeng, Msunduzi and Rustenburg. Despite having the highest reported household income (see Table 13.6), Rustenburg has a municipal expenditure per resident that lies only just above the median for the ten cities (see Table 13.5). This shows that Rustenburg is unable to benefit from all income in respect of its municipal finances. Finally, we found only one instance of a municipality (Polokwane) having contributed some of its own funding to capital investment. Although there could well be few more instances, this seems to be the exception rather than the rule. In general, these ten municipalities could certainly improve their own financial positions by ensuring that they are going concerns, and ensuring they remain so.

Table 13.5 shows that clean audits are the exception, as only Drakenstein and Stellenbosch have received clean audits during the past five financial years. Of the 27 audit outcomes shown in the table, only six are clean. A staggering 21 audit outcomes were either disclaimer, qualified outcomes or unqualified but with findings. In two of the municipalities (Matjhabeng and Rustenburg), audits for the recent financial year had not been completed.

The disruptions and vulnerability to which secondary cities are susceptible mean that change in these cities can be slow and they risk declining into a low resource poverty trap (see Chapter 2) or could be fast (in-migration or mine closure). However, some of our cities gave a more positive impression. The international literature finds that secondary cities situated close to large metropolitan areas are often less vulnerable. Supporting this finding, Drakenstein and Stellenbosch, which are respectively 60 km and 50 km from Cape Town, and Msunduzi, which is 80 km from eThekweni (Durban), are the least vulnerable of our case study cities. Another factor that reduces a city's vulnerability is being the capital of a province. Four of the case study cities, Mahikeng, Mbombela, Msunduzi and Polokwane, are in this category and draw strength from this status.

Table 13.6 shows further details of the economies of the ten cities. It shows that from 2001 to 2011 the increase in household income in nine of them outstripped the consumer price index, which stood at 5.9% per annum during that period. Stellenbosch was the exception, but although its household income grew at a slower pace, this city nevertheless had the third highest average household income.

The low dependency ratios for Stellenbosch and Rustenburg are a result of the fairly large migrant populations respectively, either students or mineworkers. Their dependency is thus located elsewhere. Students are unlikely to have dependents, and mineworkers' dependents tend to live in the rural areas.

TABLE 13.6 Employment, household income and dependency in ten secondary cities

City	Percentage employed (2011)	Percentage unemployed (2011)	Percentage youth unemployed (2011)	Household income per annum (2011)	Growth in household income per annum (2001–2011)*	Dependency ratio (2011) (%)
Drakenstein	34.8	17.1	37.1	143 343	7.8	44.5
Lephalale	30.5	22.9	26.9	100 496	13.1	43.6
Mahikeng	20.5	35.7	47.3	82 671	8.8	55.3
Matjhabeng	24.5	37	49.7	73 721	8.8	46.9
Mbombela	27.9	28.1	37.6	93 739	9.4	51.1
Msunduzi	24.9	33	43.1	110 302	8.0	46.2
Polokwane	27.9	28.1	37.6	164 000	9.4	51.1
Rustenburg	35.7	26.3	34.7	196 080	7.9	37.9
Sol Plaatje	25.4	31.6	41.7	63 049	8.2	51.0
Stellenbosch	36.6	21.5	15.2	153 233	4.7	38.4

Source: Stats SA (2011)

*The CPI in South Africa stood at 5.9% per annum during this period.

Stellenbosch and Rustenburg provide examples of two very different kinds of spatial change. Stellenbosch has a large proportion of high-density housing, particularly for students, and the urban edge is maintained. Rustenburg has dismantled its particular form of high-density housing, the compounds for the mineworkers, and the result has been informal settlement spilling over the urban edge into traditional land, where very little control is exercised. Despite the vulnerability associated with mining, Rustenburg nevertheless has the highest average household income of the ten cities. One reason for this has been the substantial increases in the salaries of mineworkers at the lower

end (particularly rock drillers) over the past five years. These higher incomes have not, however, enabled the municipality to collect rates and taxes more efficiently, plan higher-density settlements or protect the urban edge.

The case studies indicate that mining, whether in growth or decline, plays a major role in spatial change. While some effects are a direct result of mining activities, others are indirect, depending for example on a new policy for mine housing or changes in the labour regime. The effects of changes in mine housing have been discussed above. The past 25 years have seen two major changes in the labour regime: more emphasis on shift work and more dependence on outsourcing. Longer shifts are now common, generally in the form of 24-hour production cycles and longer periods off. A four-day working week followed by three days off is not uncommon. Ironically, shift work and longer time off have served to support the continued use of migrant labour, with the inevitable effects for spatial planning. Outsourcing, a business principle applied with a view to cutting costs, rigorously applied in the mining industry in the past two decades, has had serious implications for mining communities and, of course, for spatial change in mining cities. In some parts of Australia, outsourcing has become the dominant mining process. Though less prominent in South African mines, in some cases nearly 30% of a mine's workforce are on outsourcing contracts. Unlike the case in Australia, outsourcing in South Africa has led to lower salaries for contract workers, fewer workplace benefits and lower levels of union membership (Burger & Geldenhuys 2018). Contract work resulting from outsourcing contributes to higher levels of mobility, underinvestment in housing and proliferation of informal settlements (for example in Rustenburg and Lephalale).

The Mineral and Petroleum Resources Development Act of 2002 underscored the importance of local development. Social and labour plans were meant to promote collaborative planning in the mining environment. In the mining cities of Lephalale, Matjhabeng and Rustenburg we could not find good examples of collaborative planning, and poorly executed IDPs do little to help. The problem is further exacerbated by the fact that social and labour plans are part of the mining licence and therefore not public documents. Mines are generally not prepared to share them with municipalities or local communities.

13.5 Disjuncture between plans and practice

One thing that our ten case studies clearly demonstrated is just how difficult it is to put spatial planning policies into practice. Most of the ten municipalities said they were struggling to implement their SDFs. Several reasons were given for this: lack of capacity at the municipality (this was mentioned by interviewees at most municipalities), institutional disorganisation (planning units understaffed and unable to perform their functions), lack of alignment between national, provincial and local government land development endeavours (particularly in Sol Plaatje), the power of private capital (including that of the mining companies) and the fact that the development of many SDFs were outsourced to private companies. In some of the cities, the SDF was outsourced to planners who were not locals and thus did not know the city well and were not personally involved (i.e. would not have to suffer the consequences of bad planning decisions), and the municipal staff did not feel they owned or were involved in plans they did not make themselves.

A major reason for the disjuncture between plans and their implementation is the large number and variety of role players in land use decisions. The apartheid vision for land use planning was largely designed and coordinated at the national level. The relaxation and decentralisation of planning in the post-apartheid period has been responsible for the proliferation of role players. Provincial and particularly local governments are now active role players in city planning, and a further complication in many of the case study cities is the presence of traditional authorities at local level. Another reason for implementation problems is that for land use plans to be implementable requires a thorough understanding of the national economy, which is often beyond the capacity of the city's council. Another reason is the democratic requirement that the private sector be involved. For instance, in mining cities, mineworkers can now make their own decisions about housing. The strong tendency towards informal settlement formation in all ten cities implies that individual households are making planning decisions outside the framework of the law and spatial plans.

Where so many actors, with so many different values, perspectives and goals, are involved, implementation decisions are very likely to clash with the original plan. In many of our case study cities (most prominently in Lephalale, Matjhabeng and Rustenburg), municipalities lacked the adaptive leadership or power to coordinate the role players.

13.6 Influence of interest groups

Power struggles are often a cause of tension between land developers and municipalities. We saw this most prominently in Drakenstein and Msunduzi. The power struggles in our case study cities were of many kinds. Interest groups campaigning for heritage values or rurality and the protection of farm land are prominent in Drakenstein and Stellenbosch. While these issues certainly have economic value for the country in terms of, for example, tourism revenues, they often contribute to social and spatial exclusion of particular groups. Ratepayers, as an interest group, often further complicate the process of spatial transformation, influencing it both directly, by resisting more inclusive models of settlement development, and indirectly, by obliging a cash-strapped municipality to accede to their wishes because it cannot risk losing income from rates and taxes. Msunduzi is a case in point here. Another kind of power struggle occurs where a municipality has land managed by tribal authorities, as in Lephale, Mahikeng, Mbombela, Polokwane and Rustenburg. Here we see conflict over who is to control land allocation and use, complicated by people's demand for the provision of services, while paying no municipal rates and taxes or service fees. Mining companies are also a cause of power struggles. As important drivers of the local economy, they expect to have a strong say in local planning, paying only lip service to the collaborative planning outlined in their social and labour plans.

A large part of the problem is that many of the ten municipalities are unable to stand up to private capital and private interests because their own finances are unsound and under pressure. Another factor is that private sector companies prefer to act independently of local government rather than get involved in complicated municipal financial management processes.

13.7 Conclusion

Secondary cities are complex social and ecological systems. While they may not suffer from the metros' congestion and crowding or the small towns' lack of opportunities, they have their own kinds of problems. They have less diverse economies. Often, some policy objectives can be achieved only at the cost of others and accommodating all the stakeholders is difficult – all symptoms of a wicked problem. Other cities may suffer from these problems too, but secondary cities may suffer more because of their lack of economic diversity.

We believe that our findings for the ten case study cities are largely applicable to secondary cities in the country. These ten cities represent nearly 50% of the 21 secondary or 'B1' municipalities identified by the National Treasury. The case studies are from seven of the nine provinces, offering examples of mining towns, service centres and semi-diversified secondary cities. There were some notable exceptions, but on the whole, we saw similarities between the cities with regard to their spatial planning and transformation efforts.

All ten have experienced various forms of spatial change. Municipal boundaries have been redrawn several times over the past two decades, with some, such as Mbombela, having had theirs redrawn as recently as 2016 with the local government election. Policy and legislative changes have placed the burden of spatial planning and land use management squarely on local municipalities, many of which are ill prepared to cope.

Despite two decades of integrated development planning, effective municipal planning and budgeting elude many municipalities due to the complexity of the intergovernmental planning system. Municipalities struggle with programmes and projects at national, provincial, district and local municipal

spatial scales, while also taking into account diverse planning and budgeting timescales. Planning and budgeting time scales between spheres are different by design to enable more effective intergovernmental alignment.

All the case study cities, except Matjhabeng, have experienced rapid population growth (see Table 13.1), largely as a result of urbanisation. Rapid population growth, with the accompanying demand for basic services, can overwhelm the financial and organisational capacity of a municipality. The result is sprawling informal settlements or overcrowded low-income areas. Although spatial transformation is occurring in one sense in the form of urbanisation, much of this change merely entrenches existing deep-seated spatial inequalities. The desired dense, compact, sustainable and equitable city is still merely a pipe dream for planners and policymakers. Achieving spatial transformation in a complex system place specific demands on decision makers, officials and planners. They have to recognise the complexity of the system. These role players must identify the drivers of change if they hope to influence them or at least manage them. To do this, decisionmakers need to take a holistic perspective. And these decisionmakers need to exercise bold leadership, adaptive management and inclusionary planning, each in the appropriate space and time. Our case studies revealed very little evidence that decisionmakers are managing to do all this.

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INDEX

- adaptive/adaptation 29-39, 44, 80, 164, 241-243, 260-263, 283
- adaptive capacity 31, 36
- adaptive co-evolution 33, 35
- adaptive cycle/s 32, 35
- adaptive governance 36
- adaptive management 36, 44
- adaptive system/s 29-31, 34, 36-39, 80, 164, 241-243, 260-261
- complex adaptive systems 29-31, 34, 80, 164, 243, 260-261
- agriculture 45, 51, 75, 101, 119, 128, 154-155, 167, 172, 182-183, 241, 244, 253, 257, 273, 276
- apartheid 5-11, 19-20, 42, 77, 88, 90, 142-143, 149, 157, 164, 180, 184, 193, 198, 204-205, 211, 220-221, 225-226, 267, 269-270, 282
- audit 103-104, 168, 234, 277, 279
- basic services 92, 109, 151, 167-169, 174, 181, 196, 209, 215, 231, 240
- Bechuanaland 87-88
- Bloemfontein 5, 117
- boom/s 68-70, 74, 78, 82-83, 88, 155, 203-205, 212, 214, 220
- Bophuthatswana 87-88, 103, 205
- budget 56, 103, 134, 147, 168, 171, 175, 183, 224, 253, 278
- bust/s 69-70, 82, 203-204, 212
- by-laws 104, 130
- Cape Town 5, 19, 41, 43, 49-50, 52, 242, 279
- capital 32, 52-53, 56, 74, 147, 153-154, 158, 168, 172, 175, 183, 190, 195, 198-200, 224, 257, 278, 282, 284
- Capital Expenditure Framework 154, 195
- capital investment 172, 175, 183, 198, 278
- private capital 53, 282, 284
- capital (city) 87-88, 109, 141-142, 146-147, 158, 163-164, 166, 182, 189-191, 195, 198, 220-221, 226, 236, 257, 279
- car-free transport 241, 243-244
- central business district (CBD) 51, 75, 78-79, 91-92, 105, 156, 171-174, 191, 194, 199, 222-224, 227, 251
- certainty 9, 27, 33, 36-36, 230
- coal mining 68
- co-evolution 33, 35
- collaborative 33, 35-36, 197, 213, 215, 281, 283
- colonial 7, 68, 88, 109, 180, 198, 204-205, 221, 226, 267

INDEX

- complex(ity) 9-10, 15-16, 19, 25-31,
33-40, 44, 62, 67, 69-70, 80-81, 90,
110-111, 116, 126, 132, 134-137,
142-143, 149, 157-158, 164, 175-177,
199, 204, 221, 227, 230-231, 234,
241-243, 258, 260-263, 265-267, 270,
273, 284-285
- compound/s 48, 53-54, 72-73, 80,
210-211, 215-216, 219, 267, 270, 280
- contradiction/s 10, 15-16, 55, 80, 143,
266, 270-271
- cycle 32, 35, 188, 244
- De Beers 219
- development 1-2, 6-7, 9-13, 19-23, 35,
43-50, 52-56, 59-66, 68, 70-71, 73,
77-84, 87-92, 97-98, 104-113, 115,
125-131, 133, 142, 149-161, 164,
169-174, 176-177, 180, 186-201, 204,
206-207, 209, 211-213, 215-217, 220,
222, 224-226, 230, 232-237, 241-245,
247-248, 251-253, 256-263, 267,
269-271, 275, 281-286
- development corridor 159, 187-188
- Development Facilitation Act 11-12, 43,
190, 195
- development moratorium 199
- diamonds 88, 219
- disintegration 209, 215
- Drakenstein Municipality 47, 54, 62
- Durban 5, 163, 279
- East London 5
- economy/economic 1-3, 5, 9-11, 13-14,
19-22, 26-27, 31, 42-44, 46, 49, 51,
55-56, 59, 61-62, 69-73, 77-79, 82-84,
88-91, 97-98, 100-101, 105, 109-114,
116-119, 122, 124-125, 127, 129-130,
132-135, 142, 144, 146, 152-155,
157-158, 163-164, 166-167, 171-176,
179-180, 182-183, 189-195, 197,
199-200, 203-205, 207, 230, 233-234,
240-241, 243, 252-253, 255, 258-260,
273-275, 282-284
- diversified economy 146
- economic decline 117, 124, 132
- economic stagnation 129, 132, 135
- Education 22, 79, 99-100, 165, 174
- electricity 68, 72, 74, 79, 97, 102,
118-119, 134, 148, 167-168, 170, 175,
184, 194, 209-210, 222, 240, 256
- Ellisras 68, 75-77, 79
- Emergence 62
- employment 31, 67, 73, 75, 97, 100-101,
117-118, 120-122, 127, 132, 135, 150,
152-153, 156, 172-174, 205, 240,
252-253, 257, 280
- Environment(al) 14, 27, 30, 42, 44-46,
49, 53, 56, 59, 61-67, 70-71, 77, 80,
91, 116-117, 142, 152, 154, 171-173,
176-178, 191, 193-195, 226, 234,
242-243, 251, 259-263, 265, 281
- food production 241, 244, 257
- Formalisation 109, 153
- fragmentation 14, 20, 45-46, 129, 142,
188, 221, 227-228, 234
- Frances Baard 220

INDEX

- Free State Goldfields 21, 115-116, 120, 122, 125, 130
- Galeshewe 220, 222
- gated estates 42, 46, 51, 59-61
- gold 88, 101, 115-117, 121-124, 132, 141, 203, 271
- governance 12-14, 36, 42, 62, 69, 79, 89-92, 103, 149, 151, 164-165, 168-169, 174-176, 180-181, 204, 214, 220, 230
- growth points 186
- heritage 49, 51, 55, 240-241, 244, 257-258, 283
- homelands 142-143, 180, 205
- housing 11-12, 14, 16, 43, 46, 52, 60-61, 68-69, 71-75, 78-80, 82-84, 105, 120, 132, 134, 144, 146, 155-156, 164, 168, 170, 173-175, 184, 195, 204, 206, 209-211, 214-217, 220, 222, 224, 231-232, 234, 247, 251-252, 255, 259, 267, 269-270, 275, 280-282
- implementation 9, 11-12, 56, 78-79, 108, 153-154, 158, 169, 173, 192, 194-196, 198-200, 206, 213-215, 222, 225, 233-234, 282-283
- inclusive economic growth 241, 243, 252-253
- infill development 19-20, 151, 212, 245, 247, 267, 269-270
- Integrated Development Plan (IDP) 12, 47, 91, 103-104, 110, 125-126, 151, 165-166, 169, 175, 193-194, 212-214, 225, 230-233, 235-237, 240-241, 247, 253, 256
- Integrated Urban Development Framework (IUDF) 11, 13, 19-20, 43, 79, 97, 109-110, 151, 172, 190, 193, 199-200, 230
- integration 8, 13-14, 20, 42, 55, 71, 79, 126, 152, 157, 169-171, 174, 181, 189, 191, 194-195, 197, 207, 222, 230, 232, 235, 244, 271
- interest group/s 15, 244, 266, 283
- Johannesburg 5, 19, 117
- Kayamandi 239, 245, 255
- Kimberley 203, 219-221, 223-224, 227-228, 232-233
- KwaZulu-Natal 18, 163, 167
- leadership 10, 33, 36, 90, 104, 149, 169, 194, 212-213, 215, 283
- Leeto la Polokwane 188
- Lephalale 15, 18, 67-69, 71-83, 267-269, 271, 274-278, 280-281, 283
- liberal 8-9, 270
- Limpopo 18, 67-68, 179-182, 186, 193
- living-out allowance 72, 211, 215, 267
- low densities / low density 7, 19, 54-55, 90, 92, 104, 109, 196
- Mafeking 88
- Mafikeng 88-89, 92-113
- Mahikeng 15, 18, 87-113, 181, 267-268, 271, 274, 276-280, 283
- maintenance 62, 74, 103, 147, 168, 183, 199, 257, 277-278
- Mankweng 180, 186, 188, 191, 197

INDEX

- manufacturing 3, 51, 70, 72, 101, 119,
151, 166-167, 180, 182-183, 252
- Maputo Corridor 153
- Matjhabeng 15, 18, 115-117, 120, 122,
124-128, 130-132, 134-138, 267-270,
272, 274-281, 283
- Mbombela 15, 18, 141-148, 150-155,
157-159, 268-269, 272, 274, 276-277,
279-280, 283-284
- Medupi 68-69, 72-75, 79, 81
- metropolitan areas 2, 4-7, 19, 42, 205,
271-272, 279
- mine downscaling 22, 81, 120, 130
- minerals-energy complex 70, 81
- mining 3, 18, 31, 68-75, 77-84, 97, 101,
115-117, 119-122, 124, 126, 131-133,
146, 167, 182-183, 203-205, 207,
210-212, 214-217, 219-221, 226-227,
229, 234, 267, 269, 273-275, 278,
280-285
- mining boom/s 69, 74, 78
- mining companies 70-72, 78, 120, 204,
207, 210-211, 214-216, 234, 282-283
- mining town/s 21, 68, 70-71, 73, 81,
115, 203-204, 219-220, 226, 284
- mixed use 14, 244, 247
- Mmabatho 88, 92, 105
- modernist/modernism 8-9, 27, 33, 175
- Mpumalanga 18, 141-143, 146-147,
152-154, 156, 158-161, 179
- Msunduzi 6, 15, 18, 146, 163-178, 268,
270, 272-274, 276-280, 283
- municipal(city) 4, 12, 14, 19, 31, 43, 47,
49, 52-54, 56, 58-63, 69, 74-75, 77-79,
81, 88-89, 91-93, 97-98, 100-104,
106, 108-110, 113, 116-117, 120, 122,
125-126, 128-138, 143-151, 153-160,
163, 165-166, 168-175, 181, 183-186,
188-190, 192-200, 204-206, 211-217,
220-222, 224-226, 229-237, 240-241,
244-245, 247-248, 250-251, 253-254,
256-258, 260, 268-270, 275-278,
281-286
- municipal infrastructure 144, 148, 184,
235
- National Development Plan (NDP) 12-13,
19-20, 43, 97-98, 109, 151-152,
190, 225
- Nelspruit 141-144, 146, 153, 156-157
- Ngaka Modiri Molema District
Municipality 88
- Northern Cape 18, 97, 221
- North West 18, 87-90, 97, 179, 203, 206
- optimal land use 241, 243, 247
- Paarl 43, 47, 49-52, 54-55, 58-60, 269
- Participatory 44, 151, 154
- partnerships 134-135, 149
- Pietermaritzburg 6, 163-165, 170
- Pietersburg 179-181, 184

INDEX

- planning 3, 7-16, 19-23, 25-29, 31, 33-39, 42-47, 49, 52, 54, 60-69, 71, 75, 77-78, 80-82, 88-91, 97, 99-101, 104-110, 113, 115-117, 125, 128, 130, 133-139, 142-143, 149-150, 154, 156-160, 165, 169-170, 174-178, 180-181, 186, 189-190, 192-199, 204-207, 209, 211-216, 219-221, 225-226, 230-232, 234-237, 241-244, 251, 253, 258-263, 265-267, 270, 273, 281-285
- platinum 84, 89, 203-205, 209, 271
- Polokwane City 15, 18, 42, 146, 179-193, 195, 197-198, 268-270, 272, 274, 276-280, 283
- Port Elizabeth 5
- power relations 10-11, 36, 165, 211
- precinct plans 130-131
- private developers 52, 189, 196, 235
- property valuations 58
- rational 26-27, 33, 35-36, 90, 241
- Reconstruction and Development Programme (RDP) 11, 22
- relational 28-29, 33-36, 242, 260
- revenue 31, 61, 92, 109-110, 169-170, 183, 189
- rural 2, 4, 43, 48, 50-52, 54-56, 59-61, 75, 90-92, 97-99, 103-105, 108, 117, 128, 144, 151-152, 155, 174, 180-181, 186, 192, 194, 198, 221-222, 231, 234, 239, 258, 276, 279
- Rustenburg 15, 18, 80, 100, 203-217, 268-269, 271-272, 274-281, 283
- scale 13, 31, 34, 55, 74, 116-117, 131, 146, 186, 214, 232-233, 242-243, 247, 260
- secondary cities 1-7, 14-18, 42, 60-61, 69, 81, 100, 158, 180-181, 189, 192, 198, 240, 248, 251, 265, 268, 271, 273-277, 279, 284-285
- secondary cities 280
- segregation 7-8, 10, 20, 42, 45-47, 59, 69, 77, 88, 99, 142, 152, 205-206, 220, 267, 273
- self-organisation 29, 33
- settlement patterns 3, 78, 90, 98, 204, 207, 226
- settlement/s 3-5, 11-14, 19-20, 22-23, 45-46, 51-52, 54, 59, 61, 68-69, 71-75, 77-82, 87-88, 90, 92, 96-98, 104, 109, 117, 124, 129, 131, 134, 141, 143-144, 148-150, 152-153, 156-157, 164-165, 168, 170, 174-175, 180, 184, 186, 188, 190-192, 195, 198, 204, 206-207, 209-217, 220-222, 225-226, 230-233, 235, 239-240, 244, 247, 251, 256-257, 259, 267, 269, 271, 275, 280-283
- human settlements 11-13, 90, 152-153, 165, 168, 190, 195, 206, 209, 212-213, 215, 222, 226, 230-231, 233
- informal settlement/s 19-20, 45-46, 52, 54, 61, 68-69, 73-75, 77, 80-82, 124, 143-144, 148, 164-165, 168, 170, 174-175, 206-207, 209-215, 222, 225, 232-233, 235, 240, 247, 251, 259, 267, 269, 271, 275, 280-282
- National Department of Human Settlements 215, 233
- rural settlement/s 239
- settlement/s 5, 11-14, 92, 97, 190, 192, 240, 257, 269, 271, 275, 281
- slow change 15, 266, 273

INDEX

- social
 - social disruption 70, 275
 - social-ecological system 31, 91
- Sol Plaatje Municipality 15, 18, 88, 146, 219-226, 228-230, 232-234, 267-268, 270, 272, 274-278, 280, 282
- space/s 5, 9, 11, 13, 20, 24-25, 28, 31, 33-34, 36-38, 41-42, 46, 54-55, 82, 90-92, 103, 128, 134, 173, 175-176, 191, 213, 224, 241-243, 252-253, 258-262, 267, 273
- shopping space 253, 258
- urban space 20, 41, 267
- warehouse space 258
- whites-only spaces 273
- space/spatial
 - Spatial Development Framework (SDF) 12, 43, 47, 49, 52, 54-56, 59-62, 77-79, 89, 91-92, 97-98, 100, 104-105, 108-110, 125-126, 129-134, 151-154, 156, 165, 169-172, 174-176, 181, 190-193, 195-200, 212-214, 221-222, 225-226, 230-236, 241, 244, 247-248, 251-253, 255-259, 275, 282
- spatial 1, 6-16, 19-21, 23-24, 26-27, 30-31, 34, 41-44, 46-47, 49, 51-52, 54-56, 59-67, 69, 71, 75, 77-83, 87, 89-92, 98, 104-114, 117, 124-128, 130-131, 142-143, 146, 148, 150-152, 157, 164-165, 168-175, 180-181, 186, 188-195, 197-200, 204-207, 209-217, 221-222, 225-227, 230-237, 241-244, 247, 251, 253, 258-263, 265-267, 269-271, 273, 275, 278, 280-285
- SDF Implementation Plan 199
- spatial change 10, 15-16, 75, 117, 143, 148, 186, 204, 213, 241, 243-244, 259-260, 265-267, 280-281, 284
- spatial containment 54
- spatial development 7, 13, 43, 54, 56, 59-60, 77-79, 89, 98, 105-108, 125-128, 151-152, 171, 174, 188, 190-192, 198, 206, 211, 215, 230, 232, 241, 244, 247, 251, 258, 260
- spatial development framework 43, 77-78, 89, 106-107, 126-128, 151, 171, 174, 190, 192, 230, 232
- Spatial Development Framework (SDF) 43, 77-78, 89, 106-107, 126-128, 151, 171, 174, 190, 192, 230, 232
- spatial form 14, 90-92, 104, 180, 198, 273
- spatial integration 8, 13, 20, 55, 157, 170, 181, 194-195, 197, 230
- Spatial Planning and Land Use Management Act 12, 104
- spatial problems 7, 49, 52, 104, 142, 150, 212, 269
- spatial restructuring 7, 61, 212, 214
- spatial transformation 1, 6, 9-11, 13-16, 20-21, 26-27, 41-42, 52, 54, 60, 77-78, 80, 82, 98, 104, 109-110, 168-169, 171, 174-175, 192-193, 197-199, 204, 213-214, 221-222, 225, 233, 235-236, 247, 266, 273, 275, 278, 283
- spatial vision 12, 130, 190, 195, 197
- Special Economic Zones (SEZ) 114

INDEX

- SPLUMA 12, 19, 43, 54, 79, 104, 110, 126,
149, 151-152, 172, 190, 193-196,
198-200, 230, 232, 241
- Stellenbosch 15, 18, 49, 239-241,
243-248, 250-254, 256-263, 267-268,
270-274, 276-277, 279-280, 283
- suburb/s 7, 48, 51, 58, 62, 75, 109, 116,
147, 165, 169-170, 196, 207, 221, 245,
247, 251-252, 259, 269, 273
- sustainability 12, 14, 46, 78, 91-92, 98,
130, 152, 171-172, 231, 241
- systems 3, 12-13, 26-34, 54, 69, 80, 90-91,
154, 157, 164, 169, 171, 176-177,
180-181, 192, 194-195, 199, 204, 221,
231, 242-243, 260-263, 273, 284
- temporal 12, 31, 91, 221
- time 7, 9, 14, 26, 28-31, 33-36, 43, 48-49,
55, 68, 70, 78, 81, 91, 104, 124-126,
131, 143, 148, 151, 174, 180, 184,
189, 191, 193, 196, 198, 207, 213, 222,
231, 234-235, 241-243, 260, 267-268,
273, 281
- traditional 13, 32, 34, 69, 75, 77, 79-81,
89-91, 99, 108-109, 143-144, 148-151,
153-155, 157-158, 164-165, 169-171,
181, 186, 188-189, 194, 196, 198-199,
206-207, 209-210, 214, 225, 227, 241,
243, 269, 271, 276, 278, 280, 282
- traditional authorities 91, 109, 143-
144, 148-151, 153-154, 157-158, 169,
180, 188, 278, 282
- traditional land 69, 75, 79, 81, 144, 148,
150, 157, 171, 186, 188, 196, 206, 269,
271, 280
- traditional leaders 89, 91, 108-109,
158, 170-171, 194, 196, 199
- traditional leadership 90, 149, 169, 194
- transformation 1, 6, 8-11, 13-16, 20-21,
23-24, 26-27, 41-42, 52-54, 60-61,
77-78, 80, 82, 98, 104, 109-110, 148,
152-153, 168-169, 171, 174-175,
192-193, 197-199, 204, 206, 213-215,
221-222, 225-226, 233-236, 247, 266,
273, 275, 278, 283-285
- transport hub 181
- tribal 68, 90-92, 96-98, 105, 108-110,
141, 143, 149, 164, 169-170, 175, 206,
209, 213, 215-216, 283
- tribal authorities 68, 206, 283
- tribal land 91, 96-98, 110, 164, 209,
213, 215
- uncertainties 15, 27, 142, 266, 273
- unemployment 73, 100, 105, 120, 146,
166, 172, 176, 190, 222
- urban 2-11, 13-14, 18-24, 26-27, 31,
41-56, 59-66, 68, 75-78, 80-84, 90-92,
96-99, 101-105, 107, 109-111, 115,
117, 120, 129, 131, 143-146, 148,
152-153, 155-156, 158-160, 171-175,
180-182, 184-186, 188-189, 191-192,
195-196, 198, 203, 206-208, 212,
215-216, 221, 225-226, 230-231, 234,
241-242, 245, 247-248, 252, 255-262,
267, 269-272, 275-276, 280-281
- urban development framework 11, 19,
22-23
- urban edge 55-56, 78, 105, 144, 153,
155-156, 191, 206-207, 212, 241, 247,
252, 258, 271, 280-281
- urbanisation 5-6, 43, 45, 98, 186, 198,
220-221, 225, 235

INDEX

- urban sprawl 14, 20-21, 43-45, 49-51,
53-55, 59, 61, 75, 80, 82, 143-144,
146, 148, 155, 184, 186, 206, 208, 212,
231, 252, 267, 270
- urban sprawl index 43, 54
- village/s 51, 68, 75, 101, 105, 144, 153,
155, 164, 179, 181, 186, 198, 205, 220,
231
- water 67, 74, 79, 91-92, 97-98, 102, 105,
109, 118-119, 134, 148, 152, 165, 168,
174-176, 184, 189, 193, 195, 199,
209-210, 222, 240, 255-257, 259
- Waterberg 68
- Welkom 115, 117, 126, 129
- Western Cape 18, 47, 51, 240, 257
- wicked problems 26-27, 62, 132

Much of the urban research focuses on the large metropolitan areas in South Africa. This book assesses spatial planning in the second-tier cities of the country. Secondary cities are vital as they perform essential regional, and in some cases, global economic roles and help to distribute the population of a country more evenly across its surface. Apartheid planning left South African cities fragmented segregated and with low densities. Post-apartheid policies aim to reverse these realities by emphasising integration, higher densities and upgrading. Achieving these aims has been challenging and often the historical patterns continue. The evidence shows that two opposing patterns prevail, namely increased densities and continued urban sprawl. This book presents ten case studies of spatial planning and spatial transformation in secondary cities of South Africa. The book frames these case studies against complexity theory and suggests that the post-apartheid response to apartheid planning represents a linear deviation from history. The ten case studies then reveal how difficult it is for local decision-makers to find appropriate responses and how current responses often result in contradictory results. Often these cities are highly vulnerable and they find it difficult to plan in the context of uncertainty. The book also highlights how these cities find it difficult to stand on their own against the influence of interest groups (property developers, mining companies, traditional authorities, other spheres of government). The main reasons include weak municipal finance statements, the dependence on national and provincial government for capital expenditure, limited investment in infrastructure maintenance, the lack of planning capacity, the inability to implement plans and the unintended and sometimes contrary outcomes of post-apartheid planning policies.