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UNEVEN SPACES: CORE AND PERIPHERY IN THE GAUTENG CITY-REGION

March 2017

Written by

Sally Peberdy, Philip Harrison
and Yasmeen Dinath

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UNIVERSITY OF THE
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JOHANNESBURG

UNEVEN SPACES: CORE AND PERIPHERY IN THE GAUTENG CITY-REGION

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and Yasmeen Dinath

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Uneven spaces: Core and periphery in the Gauteng City-Region

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- Philip Harrison and Yasmeen Dinath



Photograph by Clive Hassall

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ACRONYMS AND ABBREVIATIONS

PART A

ABET	Adult Basic Education and Training
CSIR	Council for Scientific and Industrial Research
CSIR-GAP	CSIR Geospatial Analysis Platform
ECD	Early Childhood Development
FET	Further Education and Training
GCR	Gauteng City-Region
GCRO	The Gauteng City-Region Observatory
GCRO QOL	GCRO Quality of Life Survey
GDP	Gross Domestic Product
GGP	Gross Geographic Product
GNI	Gross National Income
GPG	Gauteng Provincial Government
GVA	Gross Value Added
HEIS	Institutions of Higher Education
IDP	Integrated Development Plan
LGBTI	Lesbian, Gay, Bisexual, Transsexual and Intersex
NRF	National Research Foundation
NSC	National Senior Certificate
NSDP	National Spatial Development Perspective
RDP	Reconstruction and Development Programme
SA&CP	Spatial Analysis and City Planning
SACN	South African Cities Network
SADC	Southern African Development Community
SAPS	South African Police Services
SARCHI	South African Research Chairs Initiative
UNISA	University of South Africa

PART B

ABS	African Buddhist Seminary
AEC	Atomic Energy Corporation
AMCOR	African Metals Corporation
AMCU	Association of Mineworkers and Construction Union
AMD	Acid mine drainage
ANC	African National Congress
BAT-SA	British American Tobacco (South Africa)
BEE	Black Economic Empowerment
BPO	Business Process Outsourcing
CBD	Central Business District
CDE	Centre for Development and Enterprise
CP	Conservative Party
CSIR	Council for Scientific and Industrial Research
DRD GOLD	Durban Roodepoort Deep
DTI	Department of Trade and Industry

ESKOM	Electricity Supply Commission
GDP	Gross Domestic Product
GGP	Gross Geographic Product
GVA	Gross Value Added
ha	Hectare
HartRAO	Hartbeeshoek Radio Astronomy Observatory
HNP	Herstigte Nasionale Party
HSRC	Human Sciences Research Council
HWAG	Hartbeespoort Water Action Group
ICT	Information and Communications Technology
IDC	Industrial Development Corporation
IDZS	Industrial Development Zones
IFP	Inkatha Freedom Party
IPAP	Industrial Policy Action Plan
ISCOR	Iron and Steel Corporation
JSE	Johannesburg Stock Exchange
KDC	Kloof-Driefontein Complex
km	Kilometre/s
MDC	Maputo Development Corridor
MIDP	Motor Industry Development Programme
MSDF	Metropolitan Spatial Development Framework
MW	Megawatt
MWU	Mine Workers Union
NASA	National Aeronautics and Space Administration
NDA	National Development Agency
NRF	National Research Foundation
NUM	National Union of Mineworkers
NUMSA	National Union of Metalworkers
NWDC	North West Development Corporation
OECD	Organisation for Economic Cooperation and Development
PAC	Pan Africanist Congress
PLC	Product Life Cycle
PRASA	Passenger Rail Agency of South Africa
PVC	Polyvinyl Chloride
PWV	Pretoria-Witwatersrand-Vereeniging
SABC	South African Broadcasting Corporation
SASOL	South African Coal, Oil and Gas Corporation
SDIs	Spatial Development Initiatives
SMMES	Small, medium and micro enterprises
UK	United Kingdom
US OR USA	United States of America
USCO	Union Steel Corporation
UWC	Union Carriage & Wagon Company (Pty) Ltd
WTO	World Trade Organisation





Introduction

Peripheries and rural/urban transitions in the Gauteng City-Region

SALLY PEBERDY AND PHILIP HARRISON

Gauteng Province is home to three of the major metropolitan municipalities in the country as well as seven local municipalities. They include cities, growing and declining towns of various sizes, small villages, ex-homeland areas as well as mining, farming and conservation areas. With a population of 13.2 million in 2015, and home to 24 per cent of the national population, Gauteng is the most populous and densely populated province in the country (Statistics South Africa (StatsSA), 2015: 1). In 2015, Gauteng produced 34 per cent of South Africa's GDP and contributed 10 per cent of the GDP of Africa (Gauteng Provincial Government (GPG), 2016: no page number). The Gauteng City-Region (GCR) sits within Gauteng, but its reach extends beyond the boundaries of the province. The Gauteng City-Region Observatory (GCRO) and the National Research Foundation's South African Research Chair (NRF SARChI) in Spatial Analysis and City Planning (SA&CP) embarked on a research project to explore the demographic and socio-spatial dynamics and place-economies of peripheral areas of Gauteng and the GCR. This work was a response to a strong focus in the existing literature on the physical and economic core of the province, the City of Johannesburg, in particular. It comes from a clear recognition that despite the wealth of Gauteng and the GCR, and their role in driving the national economy, there are places of relative peripherality which require the attention of policy makers.

This report has two parts, separately authored. The parts address different dimensions of peripherality in Gauteng, recognising that the concept of peripheries may be investigated from various

perspectives. The first part, authored by Sally Peberdy of the GCRO, explores peripheries in terms of uneven or unequal development, using the concept of periphery to mean spaces of low economic development and socio-economic marginalisation. These spaces could be in the geographic centre or edge of the city-region, or in various intermediary spaces, including those sitting outside the urban core of the city-region and province. The second part, authored by Philip Harrison and Yasmee Dinath, asks the empirical question, what is happening along the geographic edge of the spatial construct that we refer to as the GCR? While geographic peripherality may coincide with economic and social marginalisation, this is not necessarily the case. Both parts reveal that space is not static and so needs to be explored in terms of its temporality. Places which may have been peripheral historically may shift to having a core role, and vice versa. They also reveal that notions of the periphery are relational, and need to be understood in terms of scale. Thus, although Gauteng and the GCR are core economic areas of South Africa and the continent, it is possible for peripheral areas to exist within them. Similarly, areas of peripherality within Gauteng and the GCR may be relatively central within a national or sub-regional context.

The first part, which investigates the demographic and socio-economic dynamics of peripheral areas in Gauteng, explores the question through the lens of theories of uneven development. Theories of uneven development, which are usually applied at a larger scale, allow engagement with the processes that create peripheral areas, but they intrinsically create a binary construction of spaces. However,

“

This work was a response to a strong focus in the existing literature on the physical and economic core of the province, the City of Johannesburg, in particular. It comes from a clear recognition that despite the wealth of Gauteng and the GCR, and their role in driving the national economy, there are places of relative peripherality which require the attention of policy makers.

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Photograph by Clive Hassall

as this report demonstrates, investigations of core and peripheral areas can be nuanced and allow for understanding of different ways that places may be peripheral. Core and peripheral areas are usually defined using economic and demographic criteria, but it is also possible to explore how peripheralisation of places, and the people who live in them, may occur in other ways. The first part uses economic, land use and population density to initially identify core and peripheral areas in Gauteng. It then explores how these are reflected in other ways that spaces may be peripheral, and how other forms of demographic and socio-economic peripherality are expressed spatially. These include: demographically; educationally; through types and conditions of employment including income; housing; access to services; how people live in places including participation in civil society, social cohesion and quality of life; as well as access to transport and connections to other places. Based on an essentially binary construction of space divided into core and peripheral areas, Part A also grapples with the legacy of apartheid residential spatial geographies and the role of the state in creating, sustaining and ameliorating peripherality in multiple forms.

The second part is concerned with understanding dynamics of change along the spatial periphery of Gauteng and the wider GCR. It locates these dynamics within a mainly geographical literature

on understandings of edge cities, perimetropolitan areas, agglomeration, and spatial edges. It identifies categories of settlements in peripheral areas in the GCR including: zones of displaced urbanisation or former homeland areas in the north of the GCR (Babelegi); mining and ex-mining towns in the south-west of the province (Carletonville-Khutsong); industrialising ex-mining areas (Nigel and Heidelberg); state-led industrial towns on the edge of the GCR (the Vaal triangle); agricultural service centres in farming areas (Bronkhorstspuit-Ekangala); and recreational and tourist hubs (Hartbeespoort). The report uses rich case studies to explore transitions in the economies of these places. It highlights the importance of history and timing, the role of the state, and even, at times, individuals, in the development and/or decline of specific place-economies in peripheral areas of the GCR. In doing so, it also identifies possibilities for their re-invention.

Both parts of this report identify the need to engage with the role of history in shaping the socio-economic lives of residents and place-economies. Similarly, and notwithstanding the silence in much of the literature on uneven development, both reports demonstrate the need to explore the role of the state in shaping peripheral areas and place-economies as well as the lives of the people who live in them – whether through action or inaction. Although



they use different approaches to understanding the dynamics of the demographics and socio-economics of core and peripheral areas in Gauteng, as well as transitions in the place-economies of different urban spaces in the GCR, both parts of the report enrich our understanding of peripheral areas in Gauteng and the GCR.

The report sits in a policy context where provincial government, municipalities, and the metropolitan local governments of the province, have launched a number of initiatives to encourage growth and shift the distribution of economic activity in the province. These include transport initiatives to move goods and people into, out of, and within the province more efficiently. On a larger scale, these include the introduction of upgraded toll-roads (or highways) and the Gautrain project. On a more localised level, they include the development of rapid transit systems within metros to move people around more efficiently and to enable access to core areas for people living in the periphery. Development corridors and nodes have been identified to grow new economically productive spaces, increasing the diversity of economic activities and, with the approval of proposed mega-human settlements, new cities in peripheral areas of the province are even envisioned (Makhura, 2015). These reports will assist in understanding how the policies of provincial, metro and municipal governments will affect and be affected by the

demographic and socio-economic dynamics of core and peripheral areas of the provinces, as well as how they may affect transitions in the place-economies of peripheral areas.

References:

GAUTENG PROVINCIAL GOVERNMENT (GPG). (2016). The Economy of Gauteng. Available at www.gautengonline.gov.za/Business/Pages/TheEconomyofGauteng.aspx, accessed 24 March 2016.

MAKHURA, D. (2015). State of the Province Address – 2015. Available at <http://www.brandsouthafrica.com/news/1158-moving-gauteng-forward-in-2015-the-state-of-the-province-address>, accessed 5 April 2015.

STATISTICS SOUTH AFRICA (StatsSA). (2015). Mid-year Population Estimates 2015, Statistical Release P0302. Statistics South Africa: Pretoria.



Photograph by Clive Hassall



Part A

Uneven development – core and periphery in Gauteng

SALLY PEBERDY

Executive summary

Gauteng is the richest, most productive, most populous and densely-populated province in the country. Yet, although the province produces the highest proportion of the country's gross value added (GVA), and gross domestic product (GDP), and with its relatively strong, productive economy, it is not an even space. This report examines uneven development in Gauteng and the Gauteng City-Region (GCR), focusing on the socio-economic and demographic dynamics of core and peripheral areas.

Peripheries are imagined in various ways. Theories of uneven development and marginalisation which focus on the processes of capital accumulation in shaping core and peripheral areas, underpin the discussion. These highlight how peripheral economies and areas produce raw materials, particularly minerals, agricultural products and labour, for the core. Meanwhile core economies, home to secondary and tertiary sectors, refine and manufacture products produced in the periphery.

This report demonstrates that significant efforts have been made by the state to reduce inequalities between core and peripheral areas in the province, particularly in the areas of education, housing and service provision. However these efforts appear to be more visible in the peripheral areas located in Johannesburg and Pretoria (rather than the greater

Tshwane area). Furthermore, at times peripheral areas may be marginalised by the state, and core-periphery relationships may even be reinforced when the state focuses on promoting development and services in core areas, for instance in the location of new government housing.

Some spaces are peripheral in some ways and not in other ways. Peripheral areas can be economically, socially, demographically, politically and culturally marginal. This report uses economic and population density criteria to delineate core and peripheral areas in Gauteng. Peripherality and its spatial expression are explored using demographic, migration, income and employment, housing, services, connectivity and household goods criteria. Some spaces were found to be peripheral in one area, but core in another. Expressions of core and periphery in Gauteng are complicated by the history of apartheid and social and spatial engineering. Also sitting behind the discussion is migration. Gauteng is the focus of internal and international migration in South Africa. Between 1996 and 2011, the population of Gauteng increased by 64 per cent. Over half (52 per cent) of this increase was a result of in-migration. The rapidly growing population presents challenges to government when trying to reduce inequalities.

“

Space itself may be primordially given, but the organization, use, and meaning of space is a product of social translation, transformation and experience.

”

(Soja, 1980: 210)

In summary, Part A of the report found:**1. Demographics:**

Populations in the core and peripheral areas of a country should have similar age and household structures. However, demographically peripheral areas are characterised by populations with relatively high proportions of elderly people and children, large households, and female headed households. The demographics of Gauteng at times challenge accepted wisdom around the population profiles of core and peripheral areas, particularly in terms of population density and proportions of female headed households. The legacy of apartheid complicates the picture as apartheid spatial planning and inequalities persist in the spatial demographics of the province. However, overall, the demographic index constructed shows that peripheral areas are more likely to be home to vulnerable households and populations.

2. Migration and mobility:

Gauteng is the focus of internal and international migration in South Africa. In 2011, 36 per cent of the population was internal migrants from other provinces and 10 per cent international migrants. Residents of the province are highly mobile. Peripheral areas are associated with being sources of cheap labour for production, and having high rates of migration and mobility. Migrants are likely to be found in peripheral areas within or surrounding the core as low-paid labour for production in the core. Overall, peripheral areas in Gauteng show high rates of in-migration and act as sources of labour for the core. However old township and rural areas which are peripheral in other ways are less likely to have mobile residents and to house migrants.

3. Education:

Peripheral areas are more likely to have low levels of education, an uneven distribution of schools, weak schools, pupils who have to travel long distances to school, poor attendance at school and little access to institutions of higher education. Low-performing secondary schools are most likely to be found in

peripheral areas of the province. Learners in the periphery are more likely to have to travel long distances to school. Although the population of the core is more educated, government has made great strides in improving access to education across the province and peripheral areas since 1994. Between 1996 and 2011 the proportion of the population of the periphery with no schooling fell from 17 per cent to 5 per cent, and the proportion who had matriculated rose from 13 per cent in 1996 to 24 per cent in 2011. Despite this progress, the levels of education across the province pose a significant challenge to the state's plans to promote high-skilled economic development.

4. Employment and income:

Peripheral areas have higher rates of low income and insecure employment as well as unemployment, than core areas. Although peripheral areas of the province are disadvantaged in terms of income and employment, the data shows significant congruity in many core and peripheral areas in the province regarding employment and income. This may be for three reasons. First, areas which are home to black Africans and with high rates of unemployment are located in peripheral areas within the core as well as within the wider periphery. Second, people may be employed in core areas but live in peripheral areas. Thus, although the province is the core of the country, and it contains a clearly economically defined core, the cheap labour force needed for capital accumulation is located in peripheral areas both within and on the doorstep of the core. Third, perhaps reflecting low incomes in the province, mining areas of the West Rand, which are peripheral in many other ways, are not peripheral in regard to income and employment. Indicating that the processes underpinning uneven development have not been challenged, there has been little change in rates of employment, sectors of employment or income profiles of core and peripheral areas since 1996.

5. Housing:

Housing and the services people receive are indicators of socio-economic disadvantage, marginality and

peripherality. In the South African context, the situation is complicated by the spatial and housing legacy of apartheid, which led to areas with poor dwellings and informal settlements in the core of the province. At the same time, post-apartheid attempts to redress and tackle housing shortages have led to the development of new low-cost government housing that is largely on the periphery of the GCR and at some distance from economic centres where employment opportunities are most likely to be found. This is problematic as residents remain relatively spatially isolated from opportunities in the core. Households in the periphery are more likely to live in informal housing (28 per cent) than those in the core (15 per cent). They are more likely to live in one or two rooms. Despite in-migration, government has made significant progress in diminishing housing inequality between core and peripheral areas.

6. Access to services:

Access to services, including water, energy, sanitation, and refuse removal, is related to the kind of housing people live in, the infrastructure and services provided by parastatals, metros, municipalities and provincial government, as well as their affordability. The provision of infrastructure and services, or the lack thereof, is a measure of peripherality. Even though access to all services has improved across the province since 1996, access is still much poorer in peripheral than in core areas. While most of the core has adequate services, large swathes of the periphery are still underserved.

7. Satisfaction with government, participation in politics, and attitudes to democracy:

A lack of access to government is another indicator of peripherality. Residents of the periphery of the province are not disadvantaged in this regard and they are more likely to participate in community meetings. There was relatively little difference in the attitudes of residents in the core and periphery to politics and democracy.

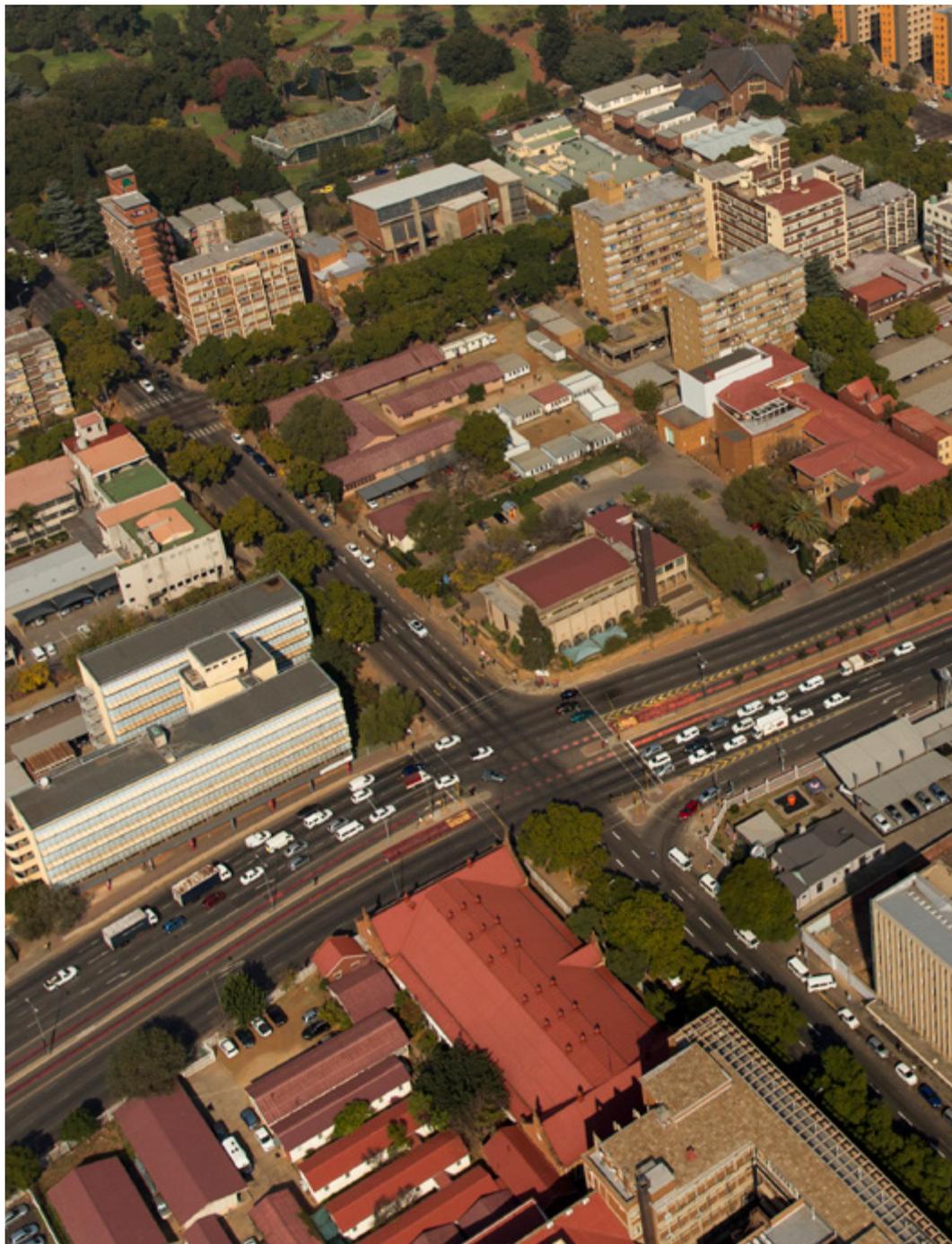
8. Living in core and peripheral areas in Gauteng:

People living in peripheral areas are least likely to have amenities including supermarkets, bakeries and banks within 750 metres of their home. They were less likely to feel safe at home or walking in their area during the day or at night than residents of the core. The lack of ownership of household goods is also an indicator of poverty and inequality. Households in peripheral areas are less likely to own radios, televisions, stoves, fridges or cars. Likewise, levels of social cohesion as evidenced in racial attitudes, homophobia and xenophobia are roughly similar, regardless of where people live.

9. Transport and connectivity:

Understandings of uneven development emphasise the flows of people and commodities from peripheral areas to core areas. Residents in the periphery are spatially marginalised and they frequently lack connectivity. An examination of transport patterns show that they reflect core-periphery relationships. People in peripheral areas travel to core areas for work, to look for work, to shop, and for leisure activities, and yet they have less access to good roads and public transport. There is some evidence of smaller localised shopping cores located in the periphery of the province. People in the periphery are least likely to have a car, radio, television, computer or to be able to access the internet from home or work other than from a cell phone. There is limited movement for any purpose except leisure from the core to the periphery.

There is evidence that government has made some improvements to service delivery in both core and peripheral areas despite high rates of in-migration, thereby reducing inequalities between core and peripheral areas in some facets of socio-economic life. However, although spatial development plans do pay attention to some peripheral areas, data on housing, employment and income shows that they have not challenged the processes that underpin uneven development. Therefore patterns of uneven development in these spheres are likely to persist.



Photograph by Clive Hassall

1. Introduction

There has been an under-emphasis in the city-region literature on how new territorial forms are constructed politically and reproduced through everyday acts and struggles around consumption and social reproduction. An especially notable lacuna is serious treatment of the role of the state and an associated politics of distribution constructed around various sites, spaces and scales across the city-region. In some respects, this silence on matters of politics and collective social agency arises from a tendency to reify the city-region itself as an agent of wealth creation and distribution. This comes at the expense of knowledge about the people, interests, and socio-political agents who populate and work in city-regions.

(Jonas and Ward, 2007: 170, cited in Etherington and Jones, 2009: 250)

Images of the province of Gauteng depict skyscrapers, malls, bustling streets and taxi ranks, and dense built environments joined by major highways connecting the province to other parts of the country and the continent. Yet Gauteng also includes mining, agricultural, conservation and unproductive land, as well as small towns, informal settlements, and other built-up spaces sometimes referred to as peripheral areas. The Gauteng City-Region (GCR) sits within the boundaries of Gauteng Province but extends beyond them. It brings together cities, towns and urban nodes that are linked together even though some of them are located in neighbouring provinces. Gauteng is the richest province in the country, and has the largest population, but the smallest land area. The 2015 mid-year population estimates put the population at over 13.2 million people (Stats SA, 2015). In 2015, the province produced 34 per cent of the national gross domestic product (GDP) (Gauteng Provincial Government (GPG), 2016: no page number).

This puts it among the top five economies on the continent (which include South Africa as a whole) (GPG, 2016). Although urban land use only covered 18.4 per cent of the province in 2009, it had grown from 12.6 per cent in 1991 (GPG, 2014: 24). Gauteng produces the highest proportion of the country's GVA and GDP, has a strong, productive economy, and is home to some of the wealthiest people in South Africa, but it is not an even space.

This project emanates from a desire to understand this uneven development in Gauteng, in particular, to understand the socio-economic and demographic dynamics of core and peripheral areas in Gauteng and the GCR. This part of the report starts with a discussion of the concepts of core and periphery and identifies some of the key relevant spatial development frameworks operating in South Africa. It then describes the methodology used here to define core and peripheral areas, and create indexes of peripherality. Using a binary construction of core and periphery, the paper then goes on to look at the demography and socio-economics of core and peripheral areas in Gauteng. The report concludes by examining what the research tells us about uneven development and the dynamics of socio-economic change in Gauteng and the GCR.

Before going any further, it is necessary to enter a caveat. As in the rest of the country, the legacy of apartheid lives on in Gauteng in racialised and gendered experiences. It is not possible to explore the multiple ways that race and gender affect the experiences of residents of Gauteng and the GCR in this report, or how they interact with the lives of people living in core and peripheral areas of the province. Yet, they are apparent in the spatial distribution of uneven development.



Photograph by Clive Hassall

1.1 Exploring the core and periphery

Peripheries are literally the ‘perimeter’, the outer edges or boundaries of an area. Some scholars who examine inequality and urban spatiality use the term in this way (Kundu et al., 2002; Simone, 2007; Pileček and Jančák, 2011; Mabin et al., 2013). But peripheral areas are also spaces which may be economically, socially, demographically, politically and/or culturally marginal, in relation to core areas (Harvey, 1970, 1973; Wallerstein, 1974, 1979; Amin, 1976; Soja, 1980, 1999; Smith, 1986, 1997; Pileček and Jančák, 2011).

Notions of core and periphery originated with Wallerstein (1974, 1979) in an attempt to explain uneven development in global economies. Building on theories of underdevelopment, he used what is called ‘world system theory’ to explain uneven development. Simply put, world system theory argues that the core areas of the capitalist world economy extract the surplus value in labour and resources found in peripheral areas of the global economy. Uneven development enables the process of capital accumulation to concentrate in the core (Wallerstein, 1974, 1979; Smith, 1986, 1997). Peripheral economies are the producers of raw materials – particularly agricultural products and minerals and labour. Core economies, as home to the secondary sectors, refine and manufacture products from the raw materials and agricultural products produced in the periphery. They are also home to financial services, wholesale, retail and hospitality services, and other tertiary sector economic activities.

Although notions of core and periphery imply a binary construction of space, they are not separate spaces but a spatial expression of processes which reflect connections between places (Wallerstein, 1974, 1979; Soja, 1980; Chirot and Hall, 1982; Smith, 1986, 1997). For Wallerstein (1974, 1979) and others (Soja, 1980; Smith, 1986, 1997; Brenner, 2013), uneven development is an expression of the processes of capital accumulation and so is part of how the global economy works. Thus, uneven spaces reflect the “production of space” by capital (Smith, 2008). But spaces cannot always be neatly divided into core and periphery (Wallerstein, 1974, 1979; Sorinel, 2010). The semi-periphery, which sits between the core and periphery, has characteristics of both and occupies shifting positions within the global economy. These areas may be declining core areas or peripheral areas with an increasingly important economic and social role (Terlouw, 1993, 2002; Sorinel, 2010). Areas that sit outside the world economy, engaged with it but of little relevance, or sometimes excluded, are considered to be external (Smith 1997; Sorinel, 2010).

Some scholars argue that the binary of core and periphery has “lost its relevance in a world of flows and complexity” (Van Hamme and Pion, 2012: 65) and look to networks and network theory to explain uneven development (Castells, 1996). Although these authors have focused on “flows of people and capital” and flows of raw materials, they are concerned with patterns of consumption and communication (Reynaud, 1981,



“As in world system theory, in network theory spaces reflect their role in a capitalist global economy. Some are central to it, some play a more tangential role, and others are largely excluded. However, that very exclusion reflects their role, or lack of it, in the global economy.”

cited in Pileček and Jančák, 2011: 44). As Van Hamme and Pion (2012) argue, this approach relies on market-force drivers and trade networks for understanding uneven development, and it denies the importance of states as major regulatory powers. It also moves away from understanding how uneven development enables capital accumulation in the context of globalisation. However, it is difficult to see a significant difference in the conclusions these authors draw about the spatial outcomes or the processes shaping uneven development in a globalised economy, beyond the emphasis on networks and consumption (Van Hamme and Pion, 2012). As in world system theory, in network theory spaces reflect their role in a capitalist global economy. Some are central to it, some play a more tangential role, and others are largely excluded. However, that very exclusion reflects their role, or lack of it, in the global economy. ‘New regionalism’ in geography also follows understandings of uneven development, again emphasising processes shaping regions, connections within them and the spaces that sit outside (Smith, 1986, 1997; Soja, 1999; Brenner, 2013; Harrison, 2013).

Scale is important. Most of the focus of research has been on global relationships and includes middle and low income countries as part of the periphery. More recent literature focusing on uneven development at a regional or national level has centred on Europe (Eastern and Western) and North America. Although there are some exceptions (Kundu et al., 2002; Barton et al., 2008; Eraydin, 2011; Felzenstein et al., 2013), middle and low income countries and regions outside Europe have largely been pushed to the periphery of the debate, or discussions have been framed within the context of their place in the periphery or semi-periphery of the global economy. Core-periphery relationships within national boundaries, or at sub-national scales, have received much less attention.

Although much of the discussion of uneven development takes place at a global level, some scholars have tried to understand uneven development at more local levels (Massey, 1979; Harrison, 2013; Pain, 2008; Etherington and Jones, 2009), including within the context of city-regions (Pain, 2008; Etherington and Jones, 2009; Roy, 2009; Harrison, 2013;). Etherington



Photograph by Gareth Pon

and Jones (2009: 249) argue that the growth of city-regions, and the interest in them, is because they “are coming to function as the basic motors of the global economy”. Gauteng and the GCR can be seen as core regions, not only of South Africa, but also of Africa as a whole. Etherington and Jones (2009: 251) argue that because of the focus on external linkages and economic development:

city-regional strategies tend to pay scant attention to the distributional consequences of competitive policies – there is little focus on the nature and extent of poverty and social inequality, the need to establish poverty reduction targets and any assessment of how policies are likely to reduce poverty rates.

Therefore, the following questions could be asked: what are the spatial effects of competitive policies in city-regions, including the GCR, and the development of core and peripheral areas? Do the processes of accumulation in Gauteng and the GCR create demographic and socio-economically core and peripheral areas within the province and the city-region? How, where, and in what ways? And are there connections between these spaces?

Core and peripheral areas are also relational. Areas defined as peripheral may be core when seen in relationship to areas around them (Holston and Caldeira, 2008; Caldeira, 2009). Similarly, peripheral areas may exist within core areas, for instance Alexandra in Johannesburg. There may also be differences within areas that would be defined as peripheral, for instance agricultural areas, where parts may be defined as core in relation to neighbouring agricultural areas (Wanmali and Islam, 1997). Thus, conceptions of core and periphery are relational as well as related to scale (Barton et al., 2008; Caldeira, 2009; Harmse, 2009). Development and growth occur unevenly and so understanding core and peripheral areas within the GCR, and the relationships between them, is intrinsic to understanding spatial differences and inequalities and may point to ways of reducing them.

Surprisingly absent from much of the discussion is the role of the state in the processes that affect the shape of uneven development (Chirot and Hall, 1982; Etherington and Jones, 2009; Wibbels, 2009; Roy, 2011; Harrison, 2013). Yet, nation states implement

policies – economic, trade, social and spatial – that have an impact on the shape and development of core and peripheral areas, and may even introduce specific spatial development policies. So, it can be argued that “the nation-state – with its supposed monopoly over sovereignty – remains a key institution in structuring spatial order” (Ong, 1999: 215-7, cited in Roy, 2011: 234), and that its role extends beyond the nation state to provincial and local levels. The state and history are particularly important in the South African context. Significant in the work of Wallerstein (1974, 1979) and others concerned with uneven development is an understanding of history. Processes take place over time and exchanges take place across and within national boundaries. The socio-economic engineering of the apartheid state created particular space economies in South Africa’s rural and urban areas, which cannot always be translated as core and peripheral (Makhulu, 2010). Apartheid urban geographies created racialised spaces with high-density settlements on the edges of cities, but the working lives of the inhabitants of these spaces were located in the centres and white suburbs of core areas. Thus, the apartheid state socially engineered apartheid-specific core and periphery relationships that are still inscribed on South Africa’s landscapes. In contemporary South Africa, the National Spatial Development Perspective (NSDP, 2007) identifies how the South African state proposes to reduce spatial disparities with a spatial development plan. At smaller scales, South African provincial, metro and municipal governments, including Gauteng, have also introduced spatial development plans.

However, Smith (1986: 92) argues that regional policies merely modify because they “treat underdevelopment, industrial decline, unemployment, poverty, and so forth, as spatial problems rather than social, political and economic ones, they never advance beyond superficial prescriptions”. As he argues, it is necessary to understand that without changes to the processes that have created unequal spaces, there can be no fundamental change. Smith’s comments reflect Soja’s (1980: 213) observation that many scholars concerned with understanding uneven development see urban planning as a tool of the state “serving the dominant classes by organizing and reorganizing urban space for the benefit of capital accumulation and crisis management”. It is evident from the

“Peripherality may also be measured using social factors whereby it is associated with the marginalisation of social groups. This approach is concerned with questions of integration and power and focuses on those outside the social groups that hold power.”

proposed solutions in the existing South African spatial development plans, including the Gauteng Spatial Development Framework (GPG, 2011), that developing networks of connectivity to reduce spatial inequalities is considered to be important. These are large-scale infrastructure projects, which, while valuable and likely to have some effect on ameliorating apartheid geographies, do little more than apply spatial band-aids to what are systemic underlying problems (Smith, 1986).

Understandings of uneven development have focused on economic processes shaping uneven spaces. Yet peripherality is also experienced socially and culturally (Appadurai, 1986; Smith, 1997; Soja, 1999; Stiglitz et al., 2009; Pileček and Jančák, 2011; Roy, 2011). Other scholars have framed the discussion using the concept of ‘marginality’ where marginality, whether social, cultural or spatial, but also emerges from economic and social processes (Mehretu et al., 2000; Gurung and Kollmair, 2005). Mehretu et al. (2000: 89) suggest that marginality “is a complex condition of disadvantage that individuals and communities may experience because of vulnerabilities which may arise from inequitable environmental, ethnic, cultural, social, political and economic factors”. They articulate various ways that individuals and communities can be marginalised. They identify contingent, systemic, collateral and leveraged marginality, which can be experienced at various scales and with different spatial implications (Mehretu et al., 2000: 91; see also Gurung and Kollmair, 2005). However, they essentially see marginalisation as a result of the processes of capital accumulation or “the dynamics of the free market” (Mehretu et al., 2000: 90). They suggest that individuals and communities may also be marginalised by prejudice as well as by being socially or geographically close to marginal communities

(Mehretu et al., 2000). Although the terminology is of marginality, the emphasis is again on economic processes shaping inequalities. However, the focus is on the impact on individuals and communities, and the social economy of marginalisation (Gurung and Kollmair, 2005). Mehretu et al. (2000) therefore emphasise the need to examine local situations, and the processes that cause marginality, for developing effective policy interventions.

Pileček and Jančák (2011) argue that analytical frameworks identifying core and peripheral areas can be divided into those that consider them to be ‘objective’ realities and those that consider them and the relationships between them to be ‘subjective’ realities. Following Leimgruber (1994), Pileček and Jančák identify six basic approaches to defining peripheral areas. The first, an ‘objective’ approach, echoing the modelling geographers of the 1950s and 1960s, identifies peripheral areas as those on the boundaries of a region, country, province, or otherwise spatially-defined area. A key determining factor in this perspective is distance from the centre or core.

Peripherality may also be measured using social factors whereby it is associated with the marginalisation of social groups. This approach is concerned with questions of integration and power and focuses on those outside the social groups that hold power. So, access to power becomes an important determinant of marginality. In this approach, concerns relate to gender, ethnicity and race, and the focus is on low-income areas and “micro-peripheral areas” in spaces which, when viewed on a larger scale, may be perceived as core (Pileček and Jančák, 2011: 47). Relatedly, cultural indicators may also be used to define peripherality whereby peripherality is associated with the segregation of cultural minorities. Spaces may also be considered as politically peripheral



Photograph by Clive Hassall

(Pileček and Jančák, 2011) – when they are outside the interests of the political and decision-making processes of the state, whether at national, provincial or local levels, or they are physically situated far from them – limiting access to the state. In these cases, the interests of places that are seen as politically peripheral are subordinate to the interests of the core. Ecological approaches reverse what is core and what is peripheral: conservation areas and unused (and relatively pristine) land are seen as core, while areas of high human activity, built up areas, and those with environmental degradation, are seen as peripheral (Pileček and Jančák, 2011).

Economically peripheral areas are usually defined using GDP and type of economy. The GDP of peripheral areas is primarily produced through the primary sector and that of the core through the secondary and tertiary economic sectors (Gurung and Kollmair, 2005; Harrison and Jones, 2009; Pileček and Jančák, 2011). Peripheral areas are likely to be distant from core areas and markets, have poor or underdeveloped infrastructure and low levels of connectivity. The population is likely to have low levels of education, or lower levels than those in the core, higher levels of unemployment and underemployment, with poor working conditions. Usually, the population is more dispersed or has lower population densities than in the core. However, as apartheid spatial settlement patterns still persist in South Africa, densely populated areas can be found in the periphery and and low-density settlements in the core. The quality of life of people living in peripheral areas is usually considered to be lower than that of people living in core areas (Oppong et al., 1988).

Economic indicators are commonly used to identify peripheral areas, whether at global, continental, regional, national or local scales. Pileček and Jančák (2011) suggest that using economic indicators alone affects how the boundaries of core and peripheral areas are drawn. So, although this study has used economic indicators by using the proportion of GVA produced in the primary, secondary and tertiary sectors for a defined area (mesozones), it has

also used other social and socio-economic indicators to understand better which parts of Gauteng are peripheral, and in what ways.

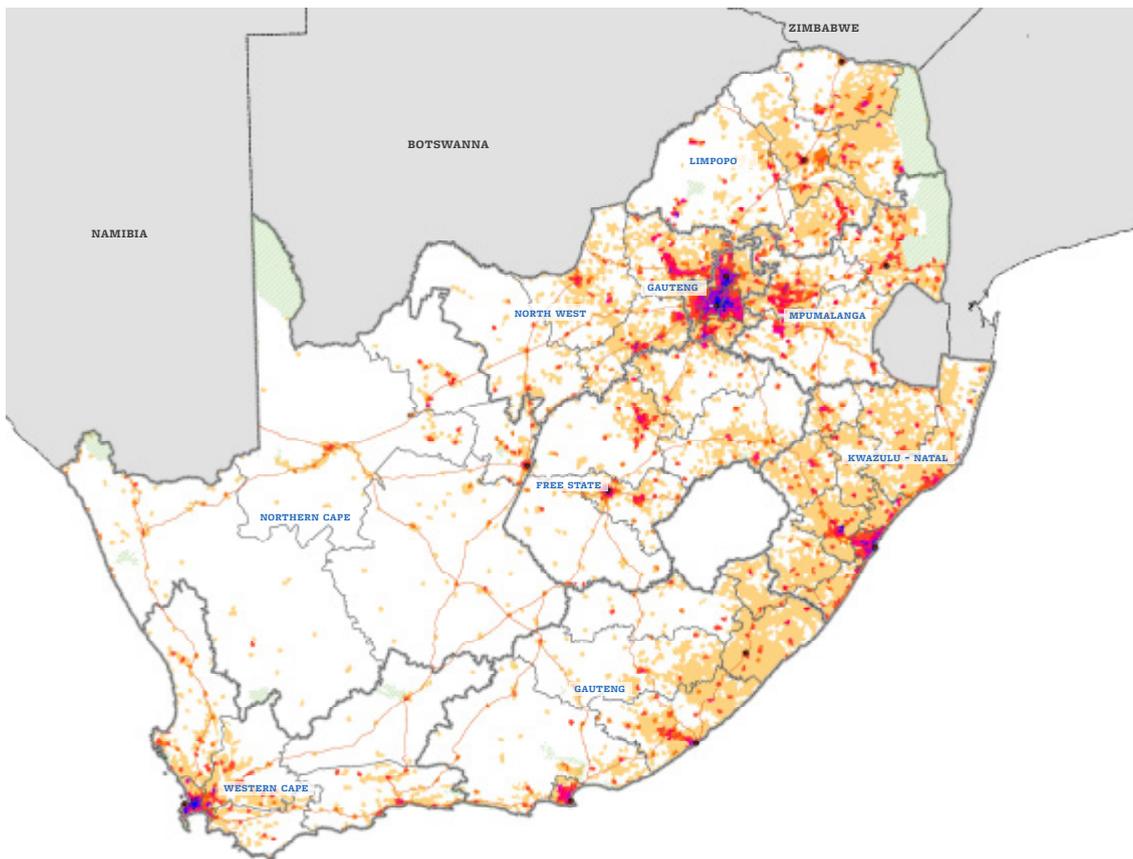
As Etherington and Jones (2009: 250) suggest, understanding “the links between economic, social and political governance, labour control, service provision, welfare policies, democracy, the politics of the urban environment and sustainability” allows for “a more rounded and holistic view of sub-national state territorialities”. In the process of trying to understand uneven development and core and peripheral areas in Gauteng and the GCR, this report endeavours to create an understanding of the city-region that extends beyond its functional economic extent, and looks at inequalities, unevenness and the multiple ways that they are experienced by its residents across the province, and where this is experienced.

1.2 Identifying core and periphery in the South African context

The Gauteng City-Region, the core region of the country, ranks as one of the largest economies on the continent. Although ranked as a world city and a global city-region, it is relatively small when considered against other city-regions in the world economy (Greenberg, 2010). Little explicit attention has been paid to uneven development within the framework of core and peripheral areas at provincial or national scales in South Africa. The South African Cities Network (SACN, 2012) looked at secondary cities, but it was concerned primarily with the relationships between South Africa’s larger urban centres, and not with understandings of core and periphery. A study by the Council for Scientific and Industrial Research (CSIR) for the SACN, the Presidency, and the Department of Local and Provincial Government (van Huyssteen and Botha, 2008), clearly identifies the GCR as the economic core of South Africa, which is leading the way in GVA (Figure 1), and scoring highest in accessibility to economic activity and services centres (van Huyssteen and Botha, 2008: 13-17).

Figure 1: Total Gross Value Added (GVA), South Africa, 2009

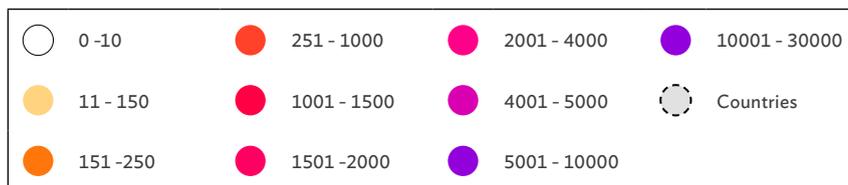
SOURCE: Map produced by CSIR; Quantec 2009



Legend:



Total GVA (Rand millions)



“Various plans have been developed since 1994 to deal with the spatial inequalities left by apartheid socio-economic ideologies, and to address on-going and newly developing spatial inequalities.”

Harmse is one of the few South African researchers to have explored unequal distribution of “income employment opportunities, urbanisation, industrialisation and general levels of development” (2009: 60). She argues that the level or size of the spatial unit influences results, and suggests that for best results “relatively small spatial units should be used” (Harmse, 2009: 60). However, since her study was a national study, she used development regions based on metropolitan areas, district management areas and local municipalities. Based on data from Census 2001, she used sixteen variables to identify “highly-developed core regions”, “upward transitional regions”, “downward transitional regions”, and “special problem regions in need of development assistance” (Harmse, 2009: 61). The variables used included population density, birth rate, dependency ratios, income, employment, sector of GVA, land use, housing type, and services/infrastructure (electricity, water and refuse removal). Harmse found that in 2001, 69.2 per cent of gross national income (GNI) was earned by people in highly-developed core regions that housed 38 per cent of the population on 5.5 per cent of the land area of the country (Harmse, 2009: 61). Only 2 per cent of GNI was earned by people in

“special problem regions” that housed 15 per cent of the total population, on nearly 10 per cent of the country’s land area. Although only 3.5 per cent of people in the areas identified as special problem regions lived in urban areas, population densities and dependency ratios were high. Less than 1 per cent of the population in these areas was employed in the formal sector, compared to 21 per cent of the national population (Harmse, 2009: 61). The core of the country was found to be Gauteng (Figure 1). Evaluating sectoral contributions to the GVA of the province indicates its role as a core area. In 2010, the tertiary sector contributed 71.1 per cent of the total GVA, the secondary sector, 24.8 per cent and the primary just 4.1 per cent (GPG, 2012: 27).

Various plans have been developed since 1994 to deal with the spatial inequalities left by apartheid socio-economic ideologies, and to address on-going and newly developing spatial inequalities. These include the ten year Integrated Sustainable Rural Development Programme (2000) and the National Spatial Development Perspective (2007). Both of these focused on state investment in rural areas to build their economies. The latter plan included focused investment in industrial agglomerations and

“Much of the focus is on enabling the economy and the development of township economies, nodes and corridors, some of which are located in peripheral areas of the GCR.”

economic development corridors, which are likely to increase core–periphery differentials (Greenberg, 2010). Although these plans may seem balanced in terms of trying to marry investment in peripheral and core areas, both lack clear understanding of the implications of the processes that have shaped South Africa’s uneven geographies, particularly socio-economic inequalities in space (Greenberg, 2010). The plans also failed to consider adequately the processes of demographic change (urbanisation), and processes of how and where capital decides to locate. When trying to understand relationships between the space economy and spatial development planning, the processes shaping the space economy, and those with the potential to do so, may be overlooked (SACN, 2013). The National Development Plan (NPC, 2011) has a more nuanced perspective on the underpinnings of uneven development, but remains focused on development plans and interventions that ameliorate rather than challenge the processes underpinning uneven development. While it accepts and accounts for on-going urbanisation in South Africa far more than its predecessors did (NPC, 2011), it remains wedded to the current economic growth path and so seems destined to perpetuate uneven development, whatever its intentions.

In many ways, the Gauteng Spatial Development Framework (2011) echoes these initiatives and shows how they may be implemented. It emphasises infrastructural development, transporting raw

materials and goods faster to their destinations, moving people quicker to work and employment opportunities, as well as improving the lives of poorer and marginalised residents through targeted settlement upgrading (GPG, 2011: 18). Much of the focus is on enabling the economy and the development of township economies, nodes and corridors, some of which are located in peripheral areas of the GCR. But when read closely, these spatial development plans reflect Soja’s (1980: 213) statement that in the “urban spatial problematic” a city is seen “not only in terms of its role as a centre of production and accumulation, but also as the control point for the reproduction of capitalist society in terms of labour power, exchange and consumption”. So urban planning in Gauteng can also be seen as a tool of the state “serving the dominant classes by organizing and reorganizing urban space for the benefit of capital accumulation and crisis management” (Soja, 1980: 213). Although the intention of the Gauteng spatial development policies is to alleviate the marginalisation of some residents, as this chapter will show, they are fundamentally about moving workers from the periphery more quickly and efficiently to the core. Some of the province’s other plans, like developing mega human settlements, imply that intended reorganisations of space will continue to prioritise the needs of capital, which underpinned socio-economic unequal development and peripheralisation in the past.



Photograph by Amanda van der Walt



Photograph by Clive Hassall

2. Methodology

Various methodologies have been used to identify core and peripheral areas. Most have been developed to enable international comparisons between countries or between and within regions at the scale of the European Union. Some methodologies use single indicators, while others use composite indicators or indexes. In a study of the European Union, Villaverde and Maza (2011) found both single and composite indicators had value in determining spatial inequalities. Stiglitz et al. (2009) highlight the need to use other indicators in addition to economic indicators to understand social, cultural and economic well-being and inequalities as well as their spatial representation. Similarly, Pileček and Jančák (2011) conclude that the richest understandings come from researchers who use multiple indicators. While economic indicators are most commonly used as the basis for identifying core and peripheral areas, Mehretu et al. (2000) and Gurung and Kollmair (2005) suggest indicators for identifying social and cultural peripherality.

Areas usually considered as core have high proportions of their GVA produced in the financial and manufacturing sectors and a high concentration of businesses. The GVA of peripheral areas is concentrated in the mining and agricultural sectors and they usually have lower concentrations

of business activity. Land use in core areas is largely urban or built-up and population density is usually high. Peripheral areas consist largely of agricultural, conservation or otherwise unused land, with lower building densities and lower population densities.

To understand whether uneven development is taking place, how and where, the core and peripheral areas of Gauteng first needed to be identified. Initially, economic and land-use criteria, along with population density measures, were used to identify core and peripheral areas in Gauteng. Then other socio-economic and demographic criteria were used to create a series of indexes of peripherality to look at how these were reflected in the economically-defined core and peripheral areas.

The index to identify core and peripheral areas in Gauteng was created using data from four sources. First, the CSIR Geospatial Analysis Platform (CSIR-GAP) project (www.gap.csir.co.za) was used. This divides South Africa into approximately 50 km square (7 km by 7 km) mesozones. The source of GVA in 2009, was identified for each mesozone, using eight categories. The proportions of GVA per mesozone produced in the agricultural, and mining and quarrying sectors, as a percentage of the total GVA of the mesozone, as well as the percentage of



agricultural and conservation land, were inverted as they are indicators of peripherality. Second, using AfriGIS data from 2010 that plots the number of businesses per kilometre, the percentage of businesses per mesozone was calculated. Third, land-use data was gathered using GTI 2.5m land-cover data from 2010. Fourth, data on population distribution for 2010 was obtained from Lightstone Demprokey X. Mesozones with high scores were counted as core areas and those with low scores were considered peripheral. This index was then mapped using ArcGIS and natural breaks. The boundaries between core and peripheral areas were then drawn.

The index to identify core and peripheral areas was created using the above data sources in the following equation (Damon, 2012: 5):

$$\frac{([Perc_TotGv] + [S3_Prop] + [S8_Prop] + [S2_Prop_in] + [S1_Prop_in] + [PERC_BUS] + [P_Rec2_in] + [P_Rec3_in] + [Perc_Rec1] + [Perc_TotPo])/10}$$

Where:

Perc_TotGv = percentage of total GVA for Gauteng

S3_Prop = proportion of the GVA for the mesozone produced in the manufacturing sector

S8_Prop = proportion of the GVA for the mesozone produced in the financial sector

S2_Prop_in = proportion of the GVA for the mesozone produced in the mining sector as an inverted % of the total GVA of the mesozone

S1_Prop_in = proportion of the GVA for the mesozone produced in the agriculture sector as an inverted % of the total GVA of the mesozone

PERC_BUS = percentage of AfriGIS business for Gauteng per mesozone

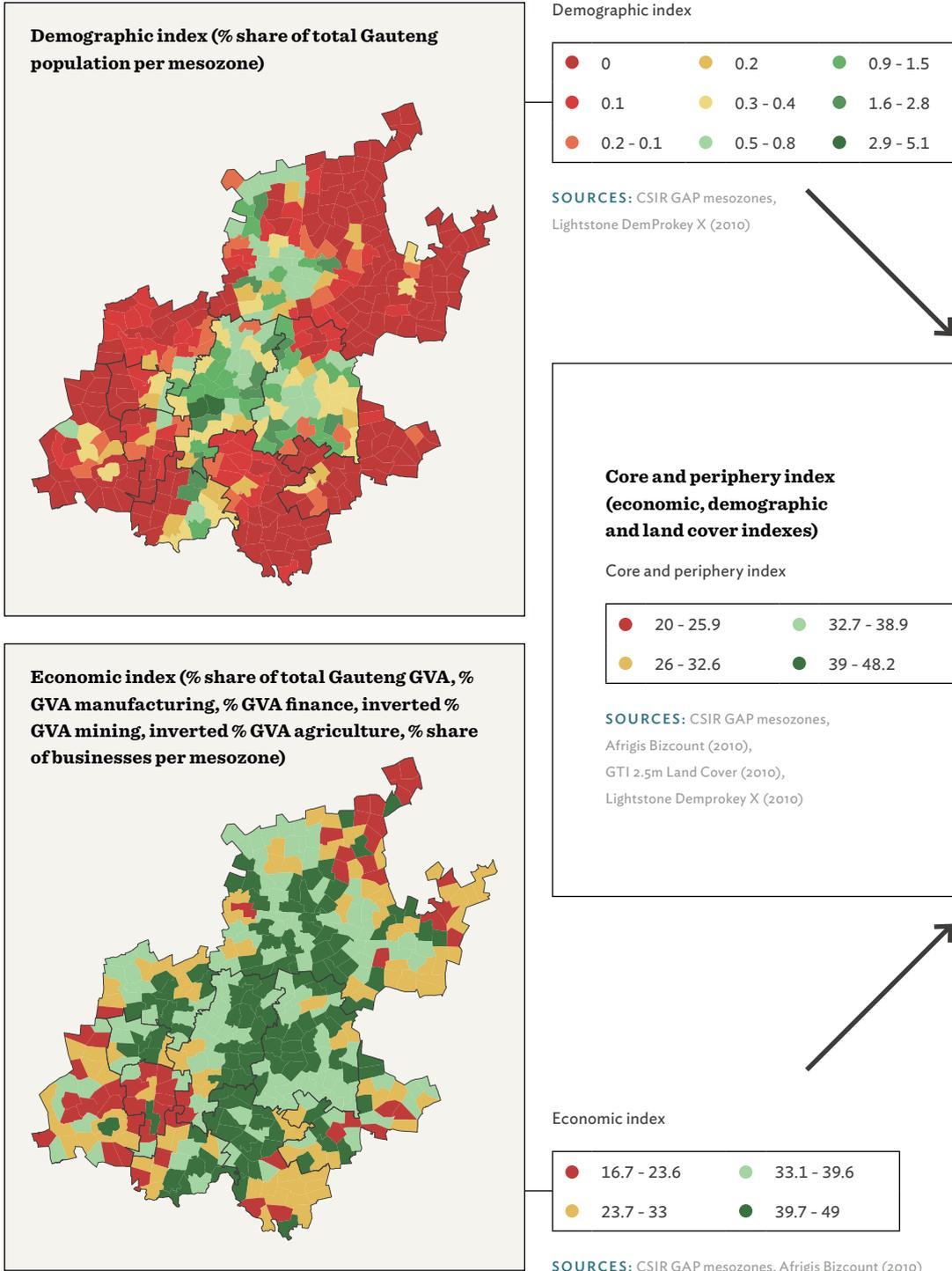
P_Rec2_in = inverted percentage of agricultural land per mesozone

P_Rec3_in = inverted percentage of conservation land per mesozone

Perc_Rec1 = percentage of urban land per mesozone

Perc_TotPo = percentage of total population of Gauteng and divided by 10

Figure 2: Core and periphery binary index

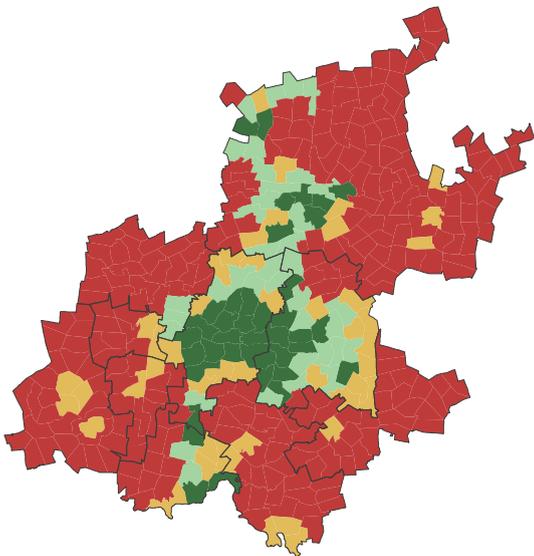
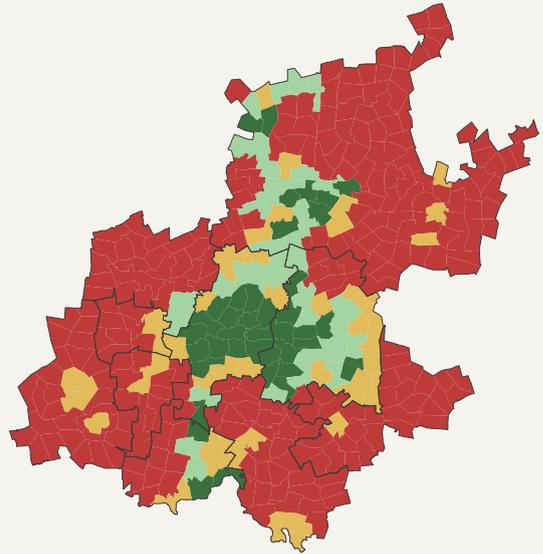


Land cover index

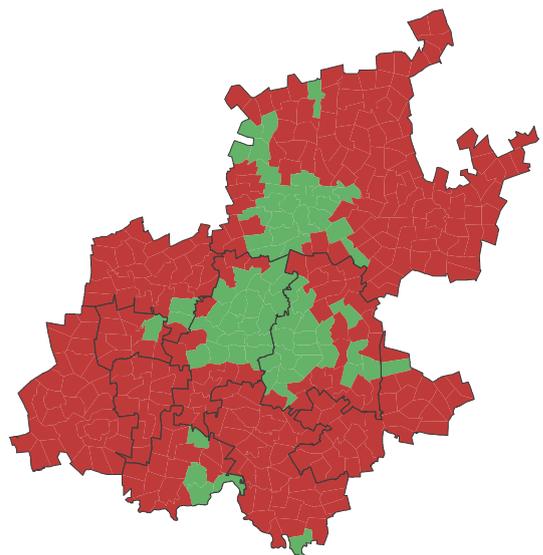


SOURCES: CSIR GAP mesozones,
GTI 2.5m Land Cover (2010)

**Land cover index (% urban, inverted % agriculture,
inverted % conservation per mesozone)**



Core and periphery index



Core and periphery index





Photograph by Chrystal van Niekerk

“As economic values are not the only indicators of peripherality – there are various ways that areas and the people who live in them may be marginalised – and in order to see what is happening in spheres other than economic production and population density, a series of socio-economic indexes were created.”

Once the boundaries between core and peripheral areas were drawn, Gauteng electoral wards (as at 2011) were assigned as core or periphery. There are 483 electoral wards in Gauteng, of which 267 fall in the core and 216 in the periphery. Electoral wards in densely-populated areas can be spatially small, while those in rural and conservation areas can be extensive. The population of wards ranges from an outlier with under 1 000 residents to one with over 43 000 residents. In 2011, 36 per cent of the population, and 36 per cent of households in Gauteng, lived in the peripheral areas identified in this study (Census, 2011).

Having created a boundary between core and peripheral areas in Gauteng, and sorted Gauteng 2011 electoral wards into the core and peripheral areas identified using mesozones, a binary analysis of relevant Census 2011 data and data from the GCRO Quality of Life (QoL) 2015 and 2013 surveys was made at ward level. As economic values are not the only indicators of peripherality – there are various ways

that areas and the people who live in them may be marginalised – and in order to see what is happening in spheres other than economic production and population density, a series of socio-economic indexes were created. The decision as to which indicators to use were informed by the work of Villaverde and Maza (2011), Pileček and Jančák (2011), Stiglitz et al. (2009), Gurung and Kollmair (2005), and Mehretu et al. (2000). The indexes created were demographic, migration, income and employment, housing, services, connectivity and household goods. Connectivity and peripherality was also explored by mapping residents' trips (commuting, shopping and leisure) within the province using QoL 2013. The main sources of data for the indexes were Census 2011 and the GCRO Quality of Life 2015 and 2013 surveys. The QoL 2013 survey was based on a representative sample of 27 494 residents in Gauteng and the QoL 2015 survey on a representative sample of 30 000 residents of the province (see www.gcro.ac.za).

3. Demography

3.1 Uneven demographics

Ostensibly, the populations of core and peripheral areas in the same country should be similar in age and household structure. However, demographically marginal or peripheral areas are characterised by populations with high proportions of elderly people and children, large households, and relatively high proportions of female headed households.

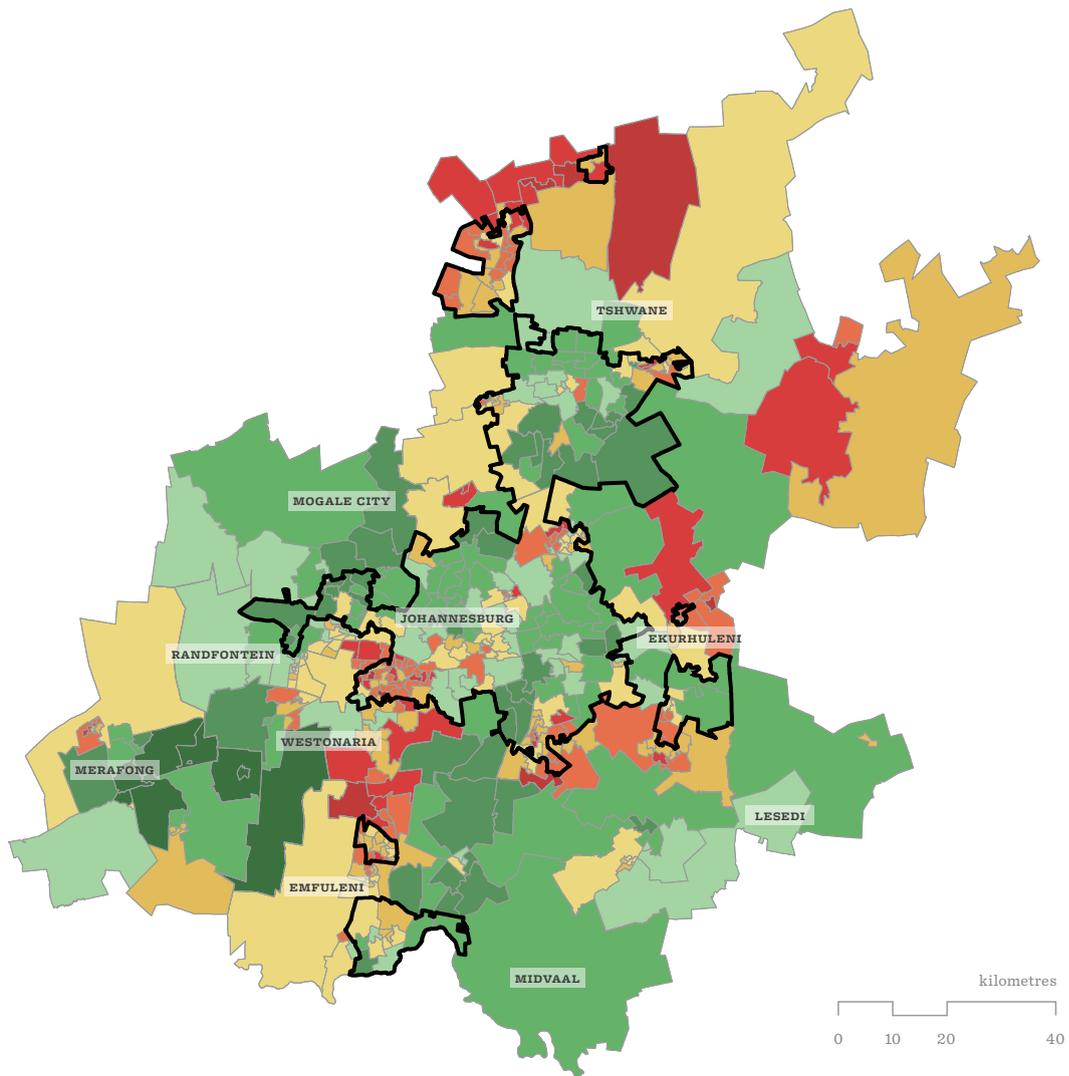
A demographic index was created using Census 2011 data by adding the proportion of the population of 65 years and older, the proportion of the population under 19 years, the proportion of households of 6 or more people, and the proportion of female headed households, per ward (Figure 3).



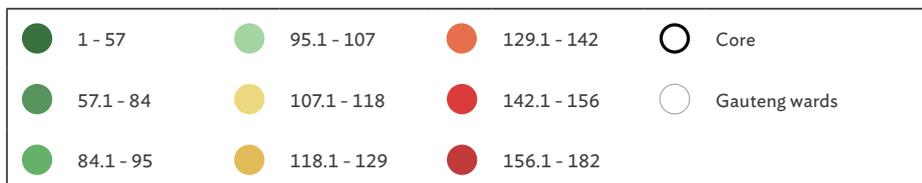
Photograph by Mark Momberg

Figure 3: Demographic index

SOURCE: Census, 2011



Demographic index





Photograph by Clive Hassall

Figure 3 shows that overall, based on the demographic index there are not clear distinctions between core and peripheral areas. While the most marginal areas of the province are located in peripheral areas, sections of core areas also show demographic peripherality. In part, these distributions reflect the legacy of apartheid geographies.

Internationally, one of the first indicators of core areas is that they have a high proportion of the population of a given area, and they are densely populated. It was not clear whether and how this would apply in the South African context. Apartheid forced black South Africans into designated areas and townships, which enabled the development of densely-populated formal and informal settlements.¹ Most of these areas were located on the outskirts of then designated white urban areas, and in the case of what were called 'homelands', on the boundaries of what is now Gauteng. Post-apartheid development of

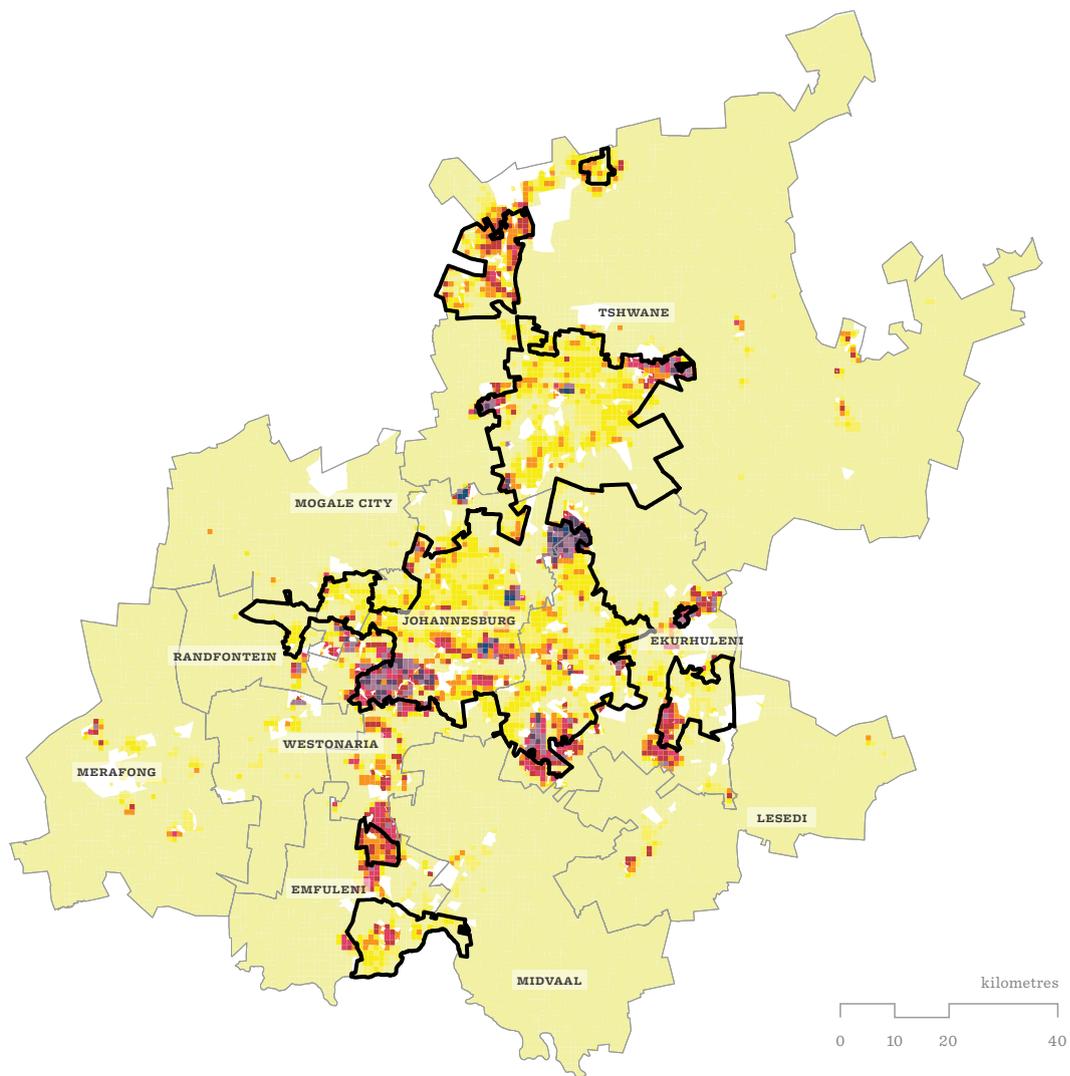
government housing has also often take place on the outskirts of urban areas where land is cheaper. Thus parts of some peripheral areas of the province are densely populated.

So, although some areas of high population density are located within the core of the province, others lie outside the core. Similarly, there are areas of low density in core areas, although the lowest density areas are in the periphery (Figure 4). Most of the wards with the highest population density in the core are spaces that, in the following analysis, appear as socio-economically peripheral, despite being within the core. This reflects apartheid geographies and the location of townships and former homeland areas. It also challenges most of the literature, which associates higher population densities with core areas and lower population densities with peripheral areas.

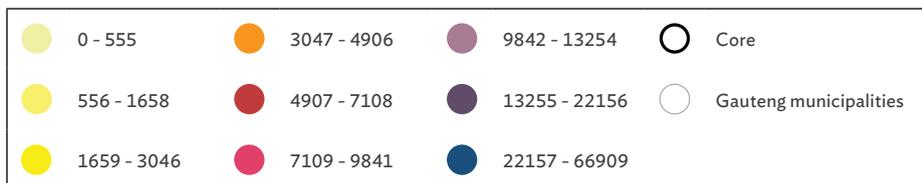
1. Here the term 'black' includes black Africans, as well as coloured, Indian and Asian South Africans, as all were affected by forced removals to designated areas during apartheid. Elsewhere the racial (or population group) categories used by StatisticsSouth Africa (StatsSA) are used: black African, coloured, Indian/Asian and white.

Figure 4: Population density (per sq kilometre)

SOURCE: Census, 2011



Population density per sq kilometre





Photograph by Kamogelo Mokoena

Overall, the sex profiles of core and peripheral areas are similar, with core areas showing a male to female ratio of 50:50 and peripheral areas a ratio of 51:49. Municipalities in the peripheral areas of the province with mining economies and associated

in-migration of mineworkers, have higher populations of men. For example, in Mogale City and Westonaria, men constitute 54 per cent and 56 per cent of the population, respectively.

Table 1: Proportion of population by race, Gauteng, 2011 (%)

SOURCE: Census, 2011

	Black African	Coloured	Indian or Asian	White	Other
Core	74	3	3	19	1
Periphery	83	4	3	9	1

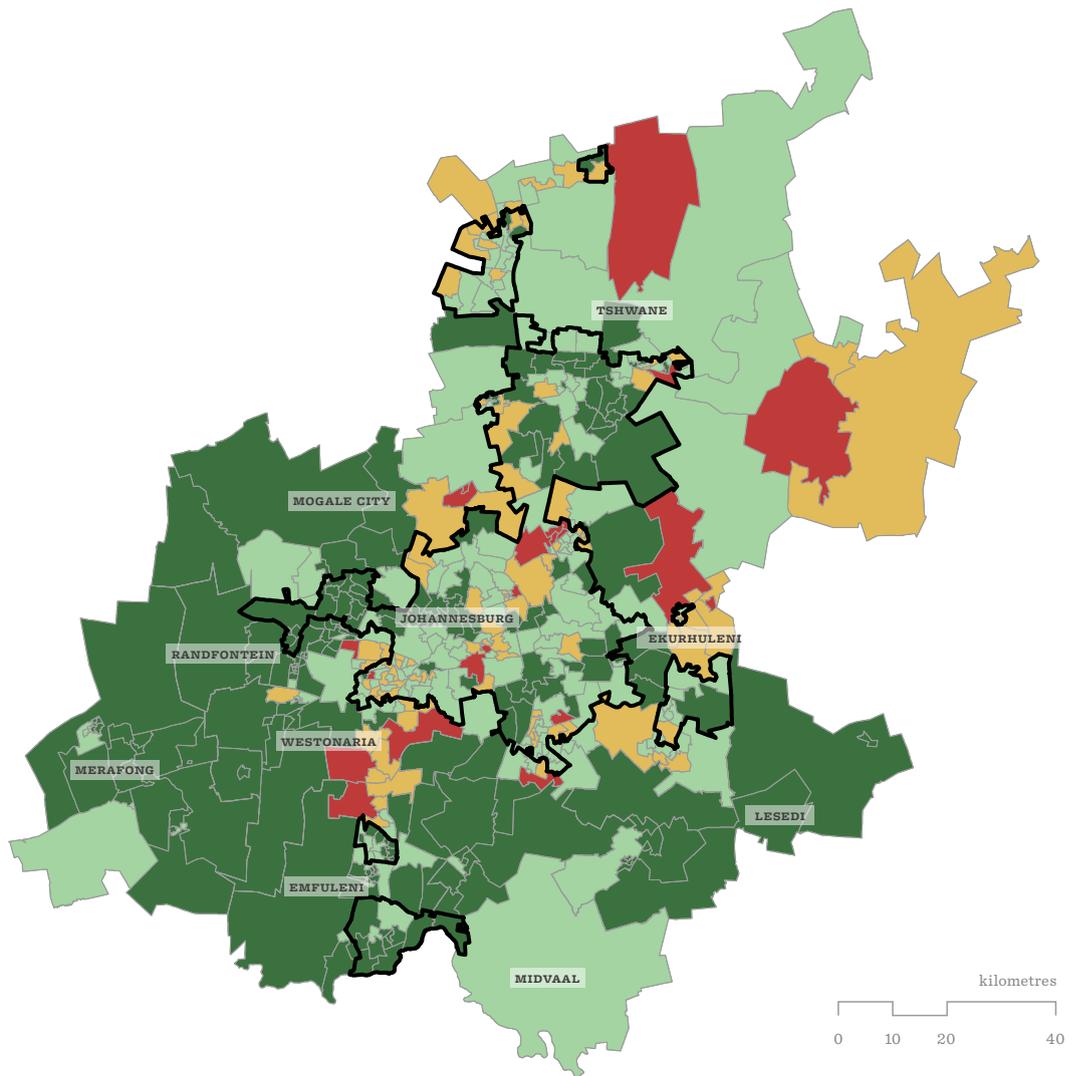
The racial profiles of the populations of the peripheral and core areas of the province are different (Table 1). In 2011, black Africans constituted a higher proportion of the population in peripheral areas (83 per cent compared to 74 per cent in the core) while whites constituted almost a fifth (19 per cent) of residents in core areas and less than a tenth (9 per cent) in peripheral areas (Census, 2011). Although ethnic or racial minorities are usually associated with peripherality, in the South African context, the white minority remains in a position of economic power and advantage. Thus, areas with higher proportions of the historically and still disadvantaged black population are more likely to be peripheral or marginal.

In the context of HIV/AIDS, high numbers of child-headed households indicate vulnerability. Census 2011 found a similar proportion of household

heads aged under 16 years in core and peripheral areas (0.1 per cent), but there were stark concentrations in some wards, mainly in peripheral areas or on the edge of the core (Figure 5). Although higher numbers of elderly people is seen as a marker of peripherality, a higher proportion of the population in the core was aged over 65 years (5 per cent) than in the periphery (3 per cent) (Table 2 and Figure 6). This reflects apartheid patterns of settlement, different age profiles by race, and the more affluent areas of the province. White, middle class, and wealthy people are likely to live longer than black working-class people (Census, 2011). Wards with higher proportions of elderly people were more likely to be found in the core, particularly the northern suburbs of Johannesburg, Ekurhuleni and Pretoria, as well as in Midvaal.

Figure 5: Number of household heads aged under 16 years per ward

SOURCE: Census, 2011



No. of household heads aged under 16 years per ward

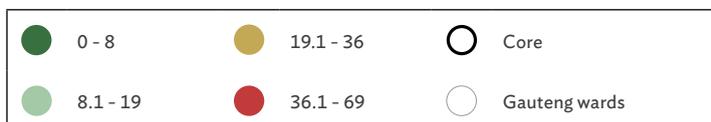
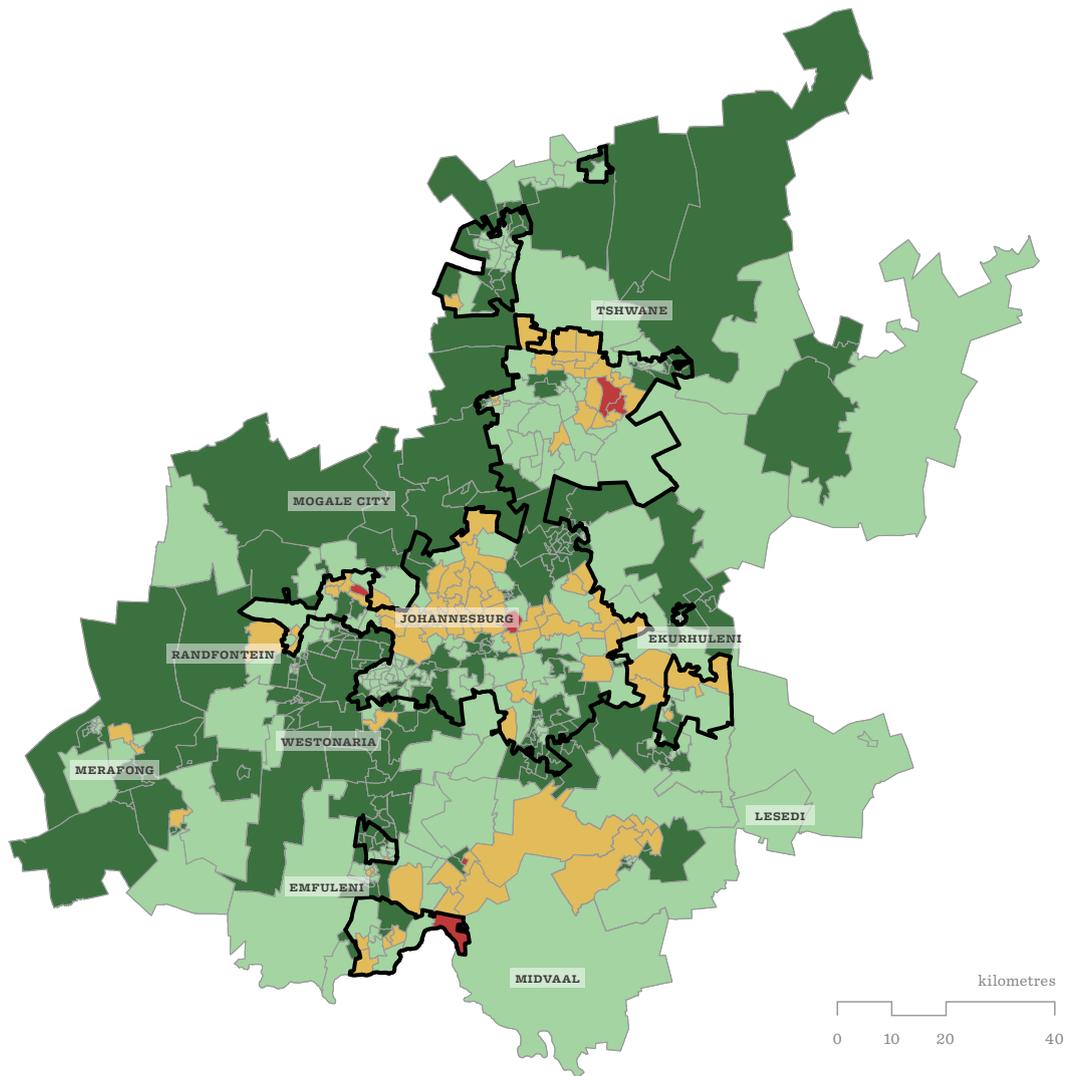


Figure 6: Population aged 65+ years per ward (%)

SOURCE: Census, 2011



Population aged 65+ years per ward (%)



Table 2: Population by age category, Gauteng, 2011 (%)

SOURCE: Census, 2011

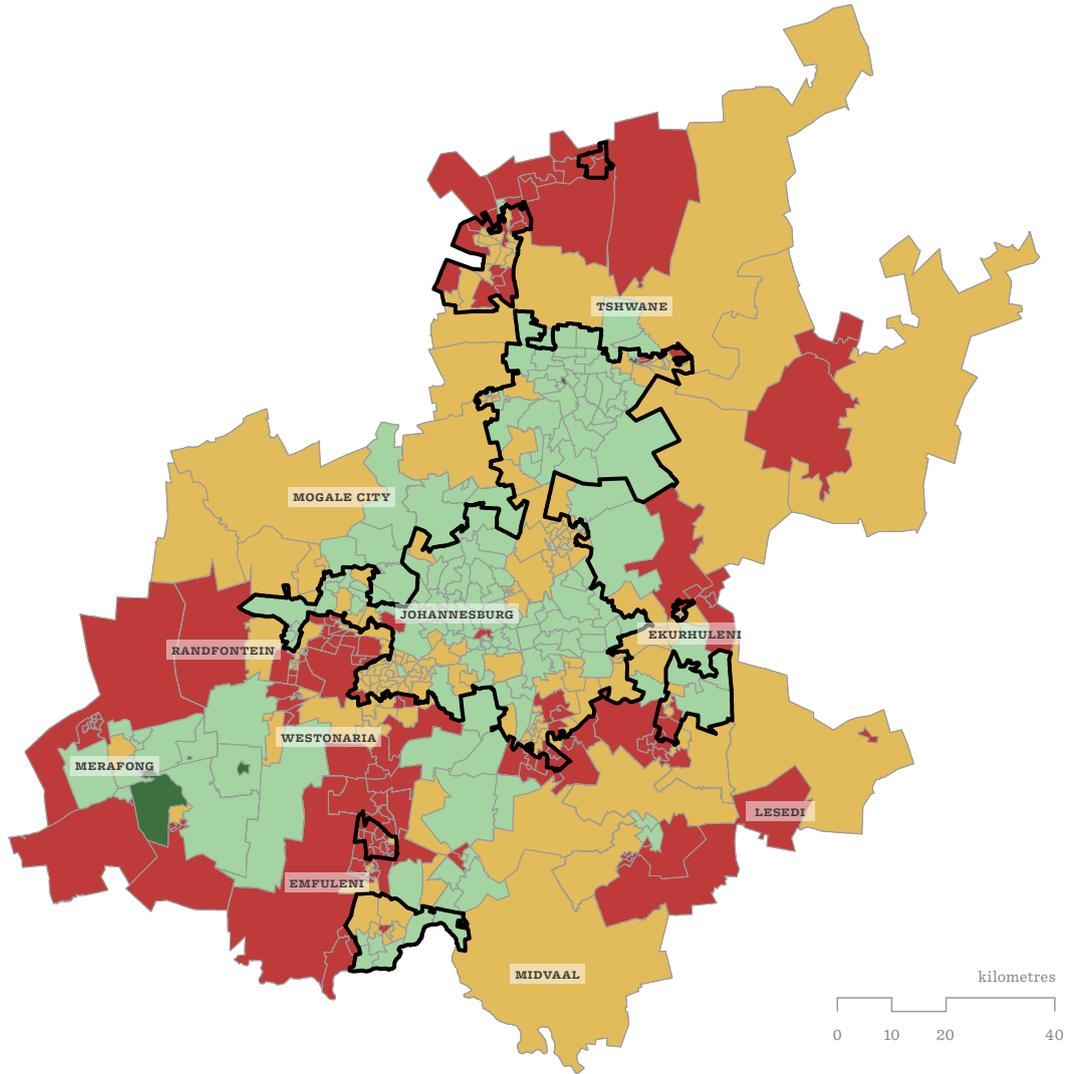
	<19 years	20 - 34 years	35 - 64 years	65+ years
Core	30	34	32	5
Periphery	34	32	31	3



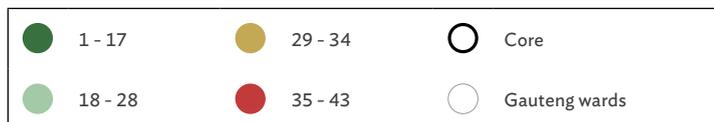
Photograph by Irene Lambrianos

Figure 7: Population aged 19 years or under per ward (%)

SOURCE: Census, 2011



Population aged 19 years or under per ward (%)



A high proportion of the population under 19 years of age is an indicator of peripherality since it is an indicator of dependency ratios. Wards with higher proportions of their populations aged under 19 years were most likely to be found in peripheral areas (Figure 7). Similarly, a binary analysis of the populations shows a higher proportion of the population living in peripheral areas to be aged under

19 years (34 per cent, compared to 30 per cent in core areas) (Table 2). This is despite core areas being home to more universities and further education and training (FET) colleges, as well as a host of public and private schools. The only exceptions in the periphery are the mining areas of Westonaria and Merafong.

Table 3: Household size, Gauteng, 2011 (%)

SOURCE: Census, 2011

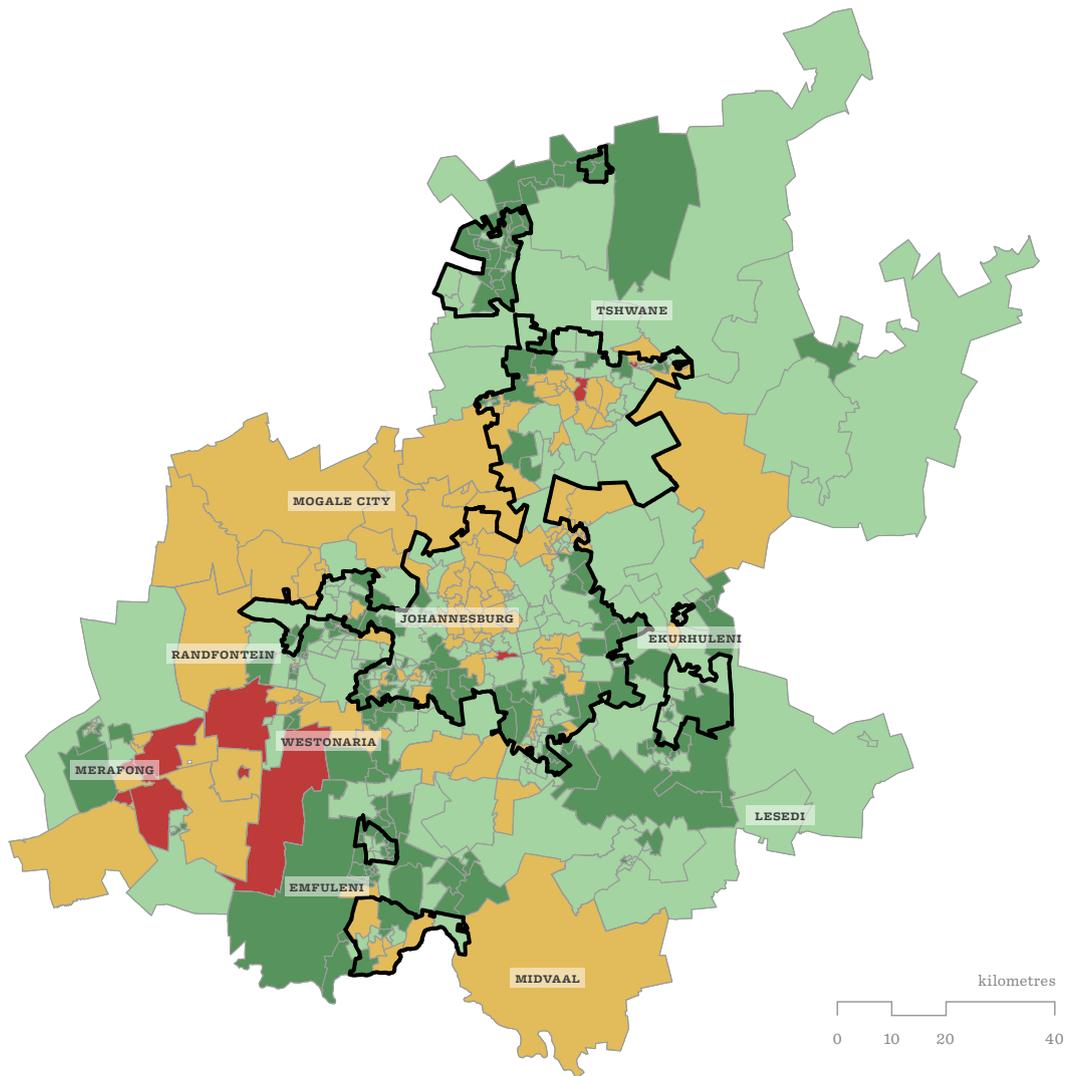
	1	2	3	4	5	6	7	8	9	10+
Core	30	24	16	14	7	4	2	1	1	1
Periphery	29	21	16	14	9	5	3	1	1	1



Photograph by Skhumbuzo Mtshali

Figure 8: Single person households per ward (%)

SOURCE: Census, 2011



Single person households per ward (%)

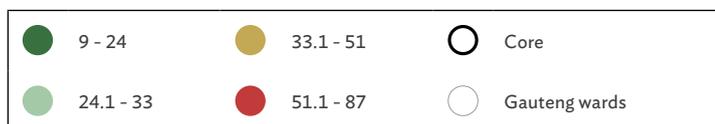
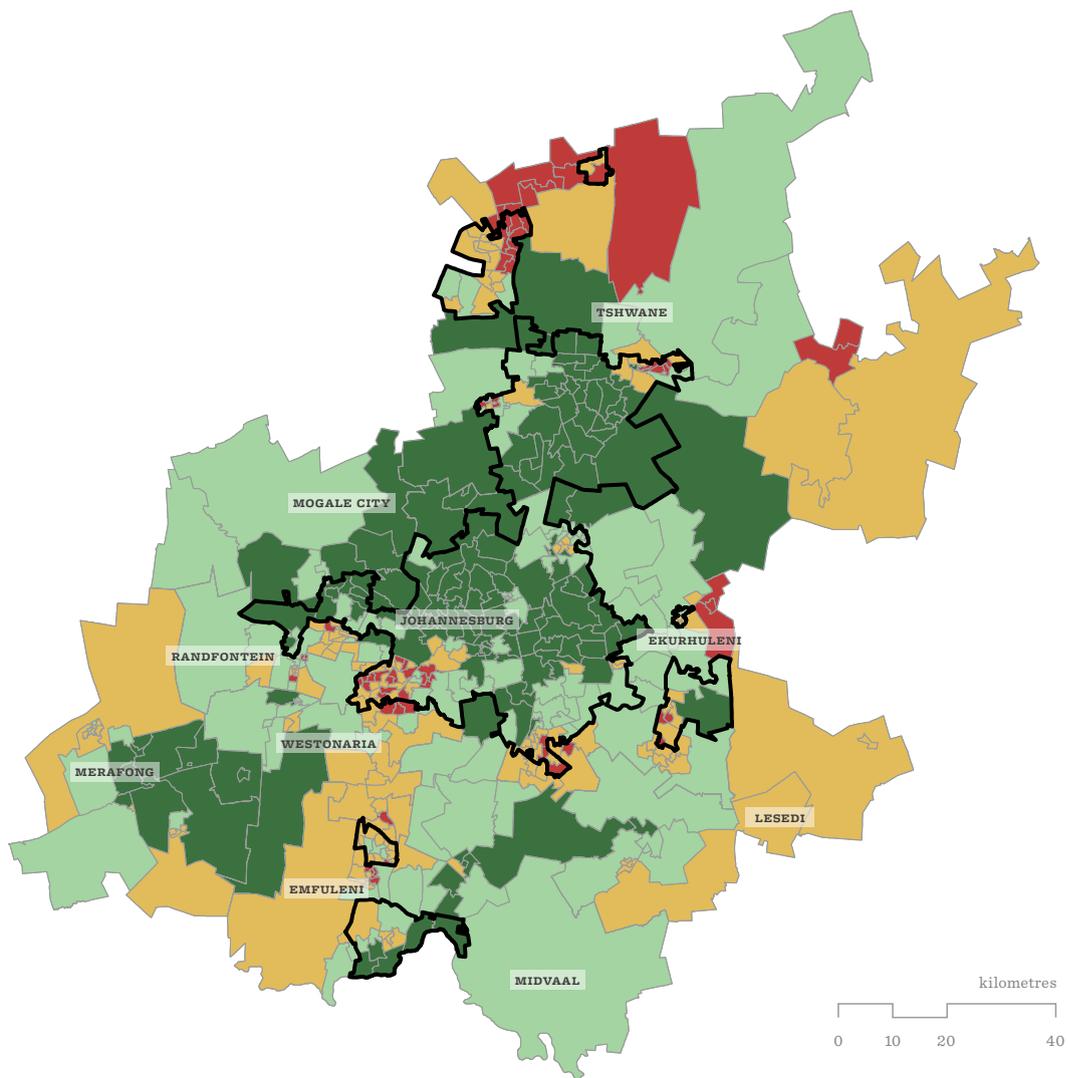


Figure 9: Households of 6+ persons per ward (%)

SOURCE: Census, 2011



Household of 6+ persons per ward (%)



Wards with the highest proportions of households of five or more members are most likely to lie in peripheral areas, although some lie in the township areas of the core – particularly Soweto and Katlehong, in the south of Ekurhuleni (Figure 9 and Table 3). When considered in a binary analysis, 11 per cent of households in the periphery are made up of six or more people, compared to 9 per cent in core areas

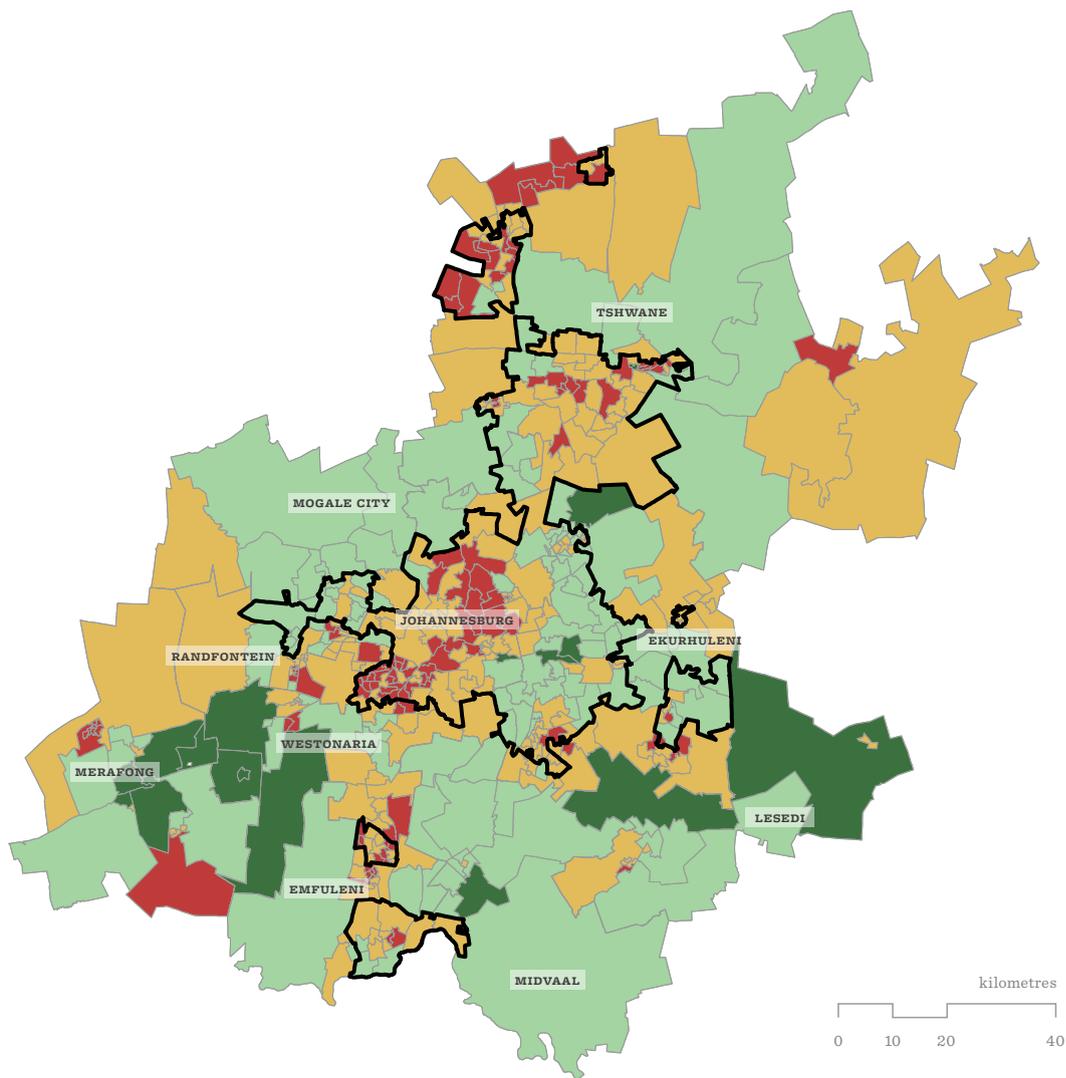
(Table 3). But, as Figure 9 shows, the distribution of large households is not even across the periphery. While not usually considered an indicator of peripherality, a high proportion of single-person households occurs in parts of the periphery, particularly those associated with mining (Figure 8).



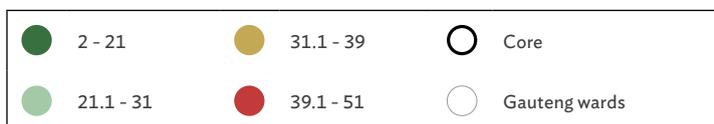
Photograph by Mikey Rosato

Figure 10: Female headed households per ward (%)

SOURCE: Census, 2011



Female headed households per ward (%)



According to Census 2011, Gauteng has the lowest proportion of female headed households of any province (34 per cent, compared to the national figure of 41 per cent). Proportionally, there were slightly more female headed households in the core (35 per cent) than in the periphery (33 per cent) in 2011 (Figure 10). However, although the proportions are similar, because of the larger number of households in the core, numerically there are nearly twice as many female headed households in core areas of the province than in peripheral areas. Although female headed households are considered to be more vulnerable than male headed households, the proportion of female headed households in the core and periphery of Gauteng should be considered within the context of changing gender relations and migration to the province.

The demographics of Gauteng at times challenge some of the accepted wisdom around the population profiles of core and peripheral areas, particularly in terms of population density and proportions of female headed households.

The legacy of apartheid complicates the picture since apartheid spatial planning and inequalities persist in the spatial demographics of the province. Nevertheless, overall, the demographic index constructed above shows that vulnerable populations and households are more likely to be located in peripheral areas.

3.2 Changing demographics

Gauteng has experienced significant population growth rates since 1996. The five years between 1996 and 2001 saw the population of peripheral areas increase by over 25 per cent, and the core by 17 per cent (Table 4). In the following decade the population increased across the province by almost a third, at a rate of 31 per cent. Statistics South Africa (StatsSA, 2013: 12) attributes 52 per cent of the increase in the population of the province between 2001 and 2011 to in-migration from other provinces and other countries.

Table 4: Population growth rates, Gauteng, 1996 - 2011 (%)

SOURCE: Census, 1996, 2001, 2011 (Quantec)

	1996 - 2001	2001 - 2011	1996 - 2011
Core	17	31	52
Periphery	28	31	68
Total Gauteng	20	31	64

There were no significant changes in the age profiles of core and peripheral areas between 1996 and 2011 (Census, 2011). However, there was a slight decline in the proportion of the population aged under 19 years and a slight increase in the proportion of the population of working age, in peripheral areas.

There were changes in the proportions of households headed by men and women in core and peripheral areas, indicating post-apartheid changes in urbanisation, the possibilities for movement,

feminisation of migration streams, and perhaps gender relations. In 1996, 30 per cent of households in the core, and 28 per cent in the periphery, were headed by women, but by 2011, these proportions were 35 per cent and 33 per cent respectively. Perhaps reflecting the decline in the mining sector and/or changes in the social structures around mining, there was a 1 per cent increase in the proportion of women to men in peripheral areas between 1996 (52:48) and 2011 (51:49).



Photograph by Kamogelo Mokoena

4. Migration and mobility

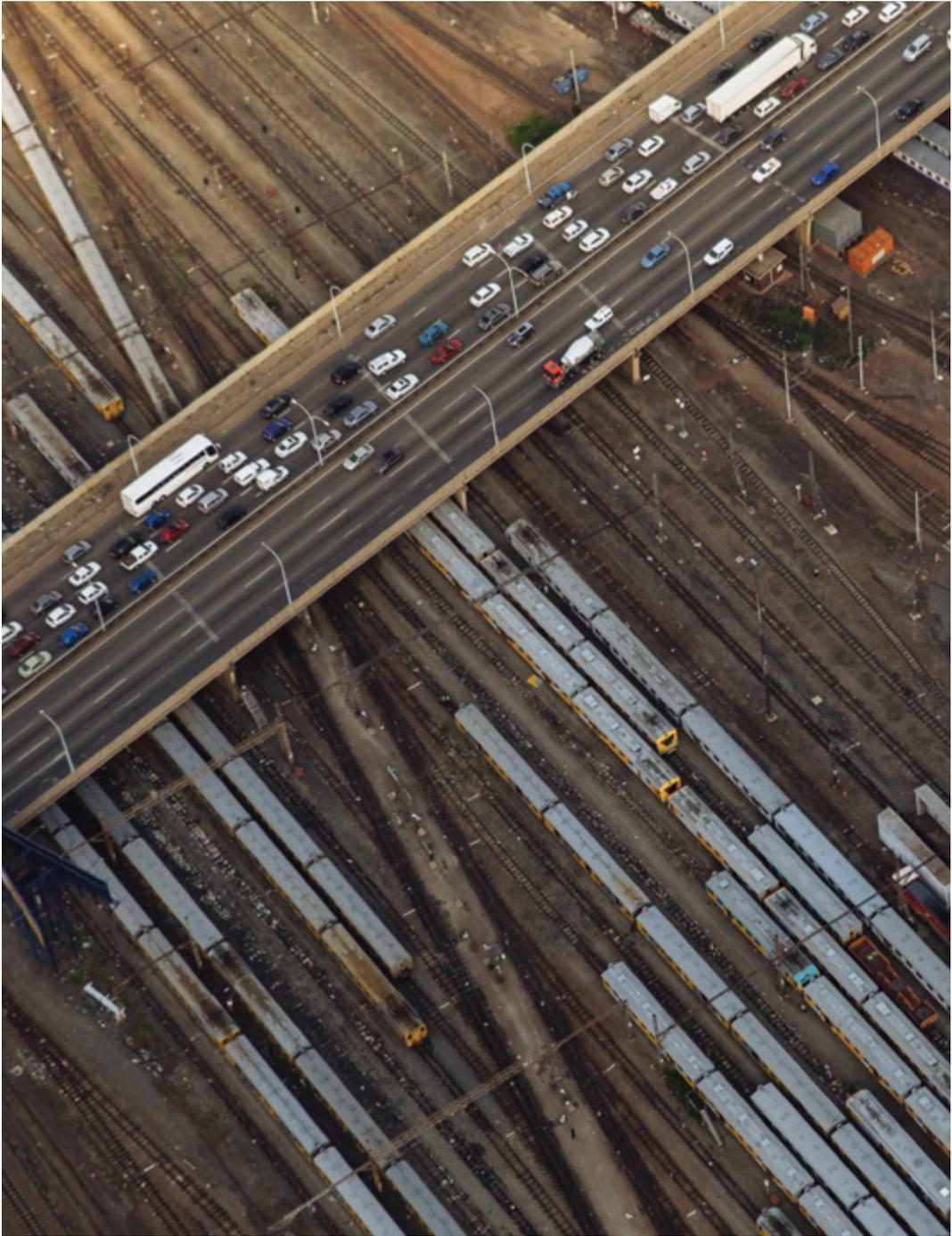
4.1 Uneven patterns of migration

Peripheral areas are associated with being the source of cheap labour for production. Most literature relating to understanding core–periphery relationships is on a global, or inter-nation state scale, where the focus is on countries considered to be peripheral providing labour for off-shore production and extraction for corporations based in countries in core areas. However, migration is sometimes considered at a different scale where core areas attract migrants as low-paid labour for production in the core (Balibar, 2007; Holston and Caldeira, 2008). These migrants are likely to be found in peripheral areas within or surrounding the core. Much of the literature associating migrant populations with peripheral areas refers to high-income countries in Europe and North America with aging populations. In these places, migrant populations are seen as identifiers of areas of peripherality. Thus, high rates of migration, mobility, and high proportions of migrants in the population, are associated with peripheral areas as peripheries are seen as labour pools for core areas.

Using migration to identify peripheral areas and associating migrants with peripherality may be problematic in the context of Gauteng and South Africa. South Africa is an urbanising country. Census 2011 was the first census in which over 50 per cent of

the black population of the country was found to live in urban areas. Gauteng is the primary destination in South Africa of both internal and international migrants. Census 2011 found that almost half the population was born outside the province: 36 per cent of the population was born elsewhere in South Africa, and 10 per cent outside the country (Census, 2011). However, the Community Survey of 2016 found that the numbers of both internal and international migrants, and the proportions they made up in the overall population, had fallen.² It estimated that 65 per cent of the population of the province was born in Gauteng, 27 per cent in another province and 8 per cent in another country (StatsSA, 2016: 28). Although migrants may find themselves on the spatial, social and economic margins of the city, evidence suggests that in Gauteng, they are not significantly economically disadvantaged compared to the Gauteng-born (Peberdy, 2013a). However, they may find themselves excluded and marginalised socially, particularly cross-border migrants. The spatial distribution of migrants in Gauteng reflects what Wilson (2011:1) calls the “durability of the legacies of poverty and inequality” of apartheid, as well as the persistence of labour migration, particularly circular labour migration in post-apartheid South Africa and southern Africa (Peberdy, 2013a, 2013b).

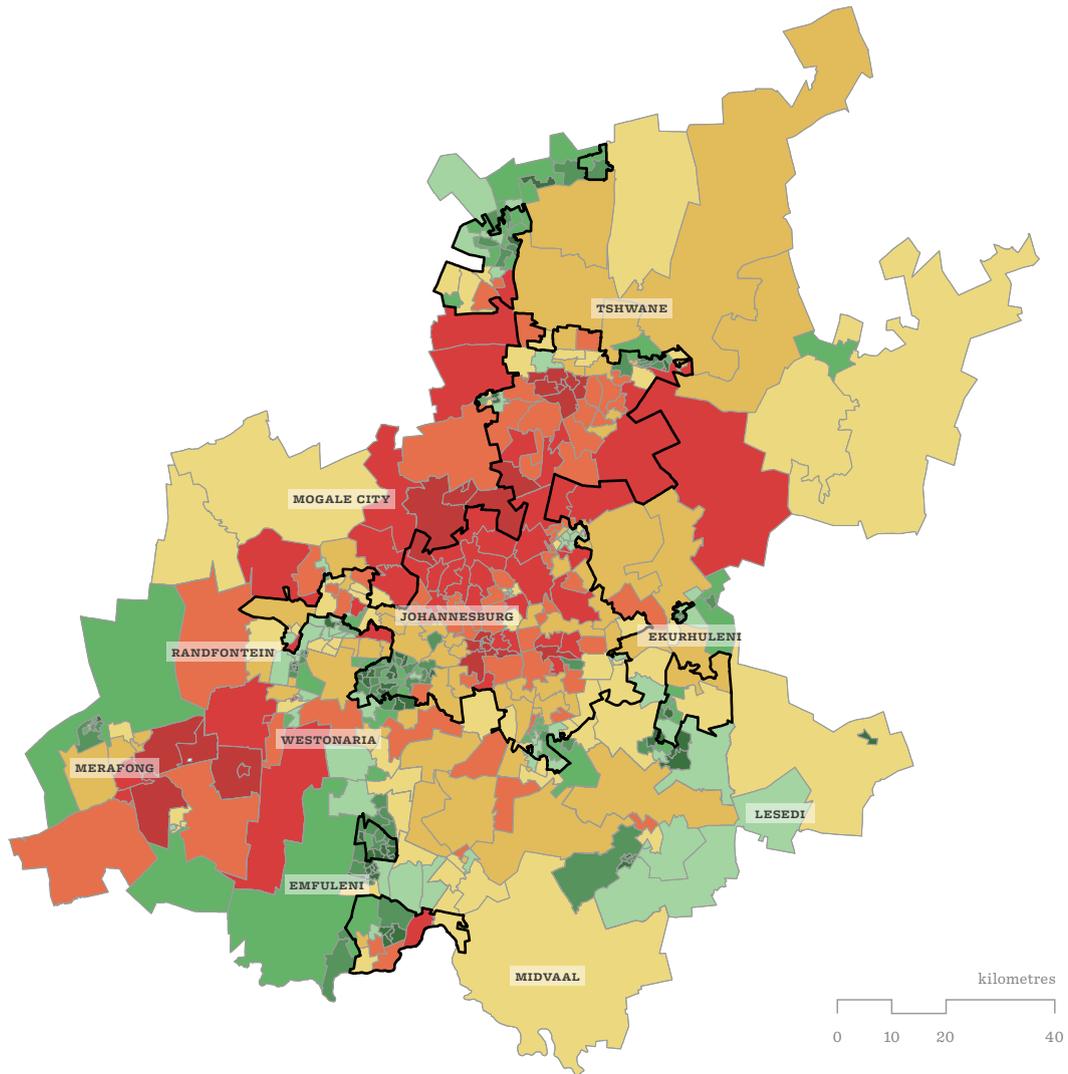
2. The Community Survey is designed to provide more up-to-date information on population and households. It is one of a number of surveys that Statistics South Africa undertakes between censuses, such as the Mid-year Population Estimates, the Quarterly Labour Force Survey, the Survey of Employers and the Self-Employed. The purpose of the Community Survey is to provide updated information to policy makers for service-delivery uses. Community Survey 2016 interviewed 1.3 million households across South Africa. As in the censuses, all individuals in a household are enumerated. There are some differences in the questions asked in the two surveys, but the core questions are the same. This part of the report continues to use Census 2011 data as it can be disaggregated to ward level, unlike the data from the Community Survey.



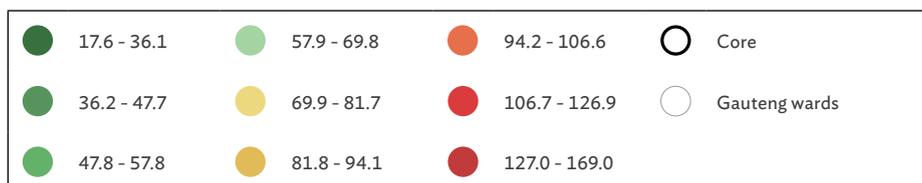
Photograph by Gareth Pon

Figure 11: Migration index

SOURCE: Census, 2011



Migration index



“Binary analysis of the populations of peripheral and core areas in Gauteng using Census 2011 data found that a higher proportion of the population in the core of the province was made up of migrants.”

A migration index was created, despite reservations about the role of migration in an urbanising core being used to identify areas of peripherality in Gauteng (Figure 11). The index added together the proportions of the population, per ward, that had been born outside Gauteng (whether in another province or another country), and the proportion that had moved dwelling whether within or into the province since 2001 (Figure 11). The population of the province is mobile. Figures 11 and 12 show that the core of the province is mobile and contains significant concentrations of migrants. Figure 12 demonstrates that migrants constitute significant proportions of the population of core areas, except in the areas on the edges.

Significantly, older townships in core areas such as Soweto, Mamelodi and those in Emfuleni, which appear peripheral when socio-economic indicators are used but lie in the originally identified core area, show low rates of in-migration. Obviously peripheral areas associated with mining, show high rates of migrancy. High proportions of migrants in Midrand reflect its rapid development in the past decade and the growth of settlements like Diepsloot. Binary analysis of the populations of peripheral and core areas in Gauteng using Census 2011 data found that a higher proportion of the population in the core of the province was made up of migrants (Table 5).

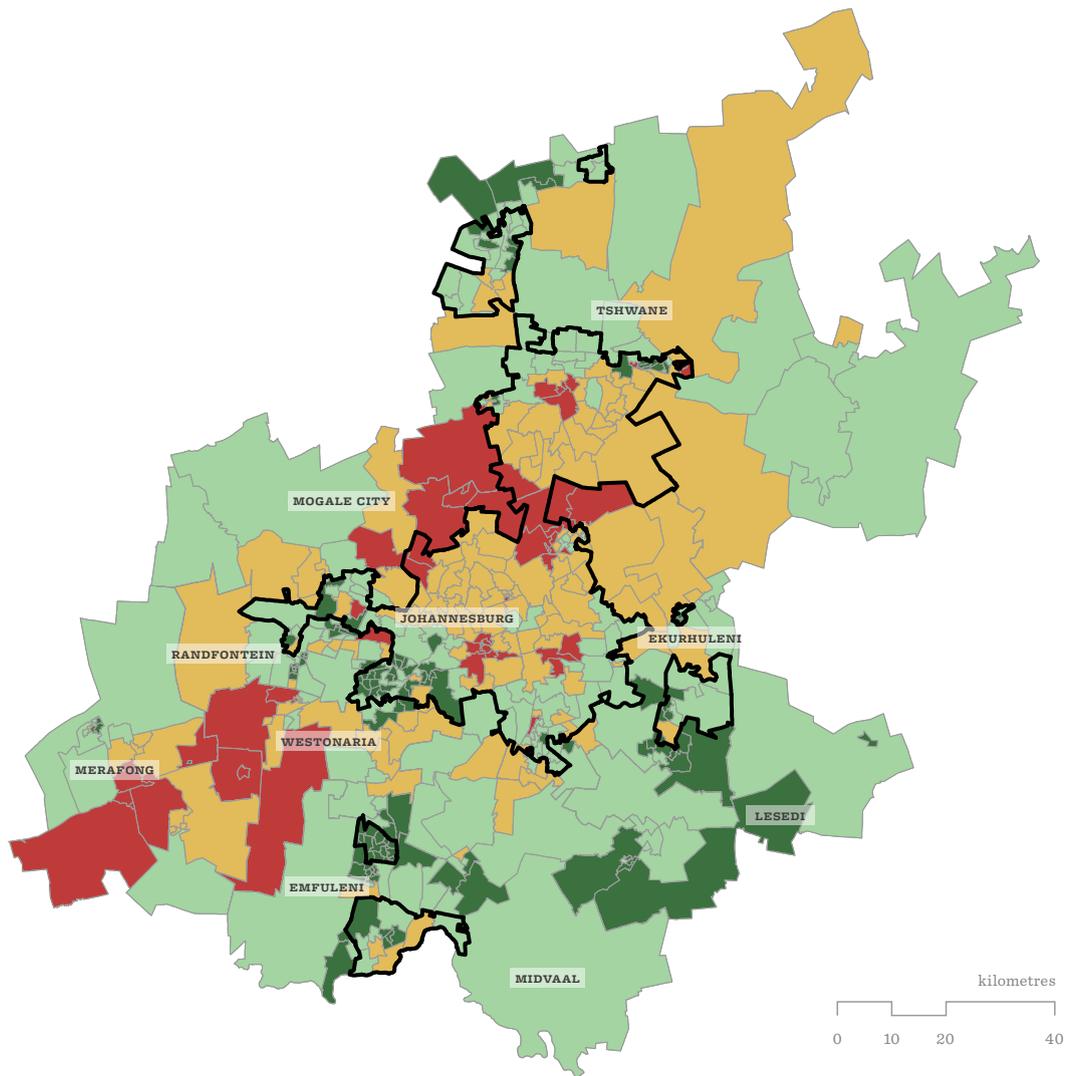
Table 5: Proportion of migrants in core and periphery, Gauteng, 2011 (%)

SOURCE: Census, 2011

	Born in another province	Born in another country	Gauteng born
Core	35	10	55
Periphery	34	8	58

Figure 12: Population born outside Gauteng per ward (%)

SOURCE: Census, 2011



Population born outside Gauteng per ward (%)

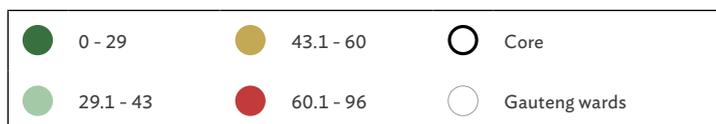
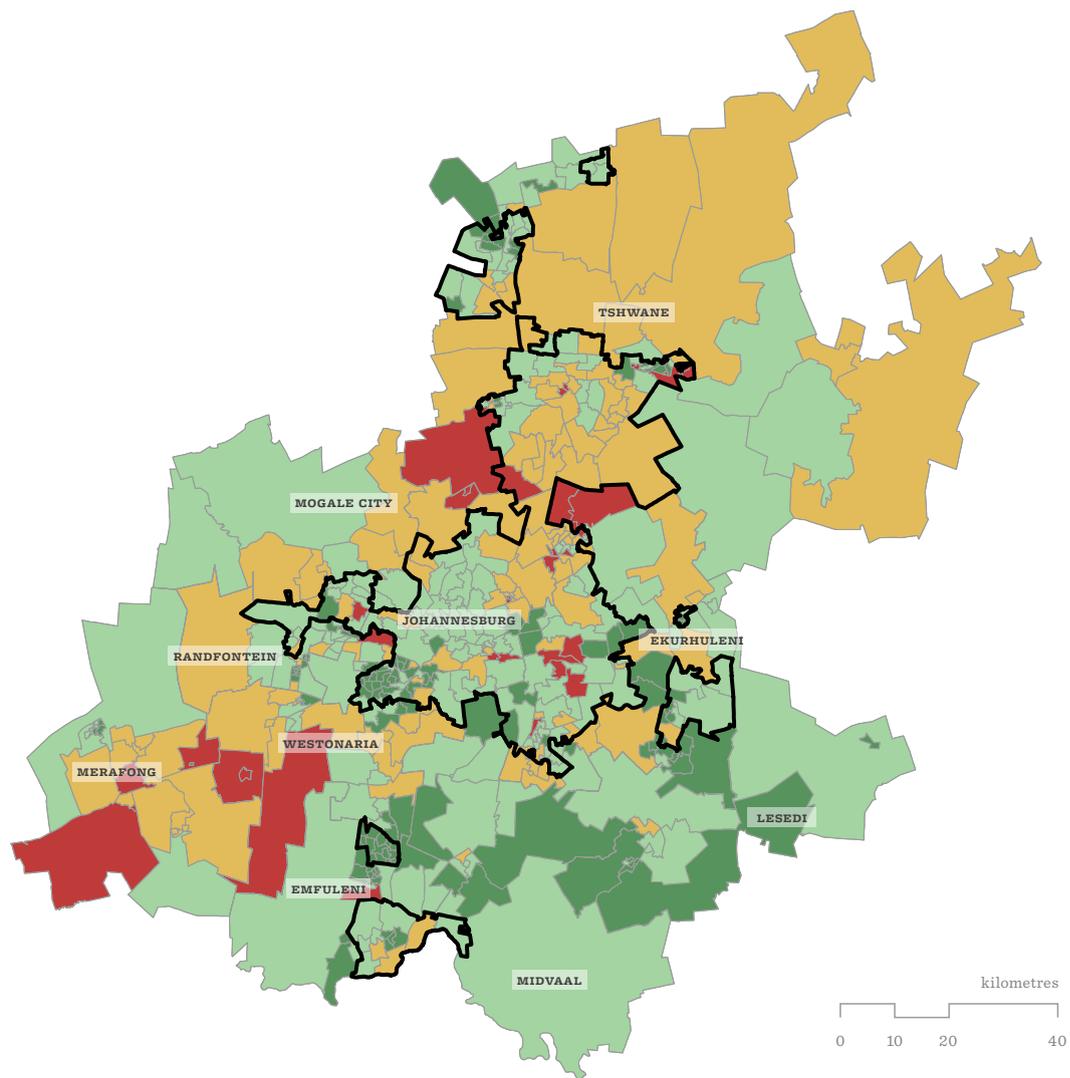
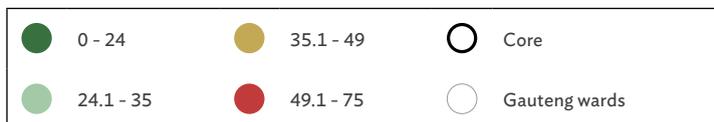


Figure 13: Internal migrants per ward (%)

SOURCE: Census, 2011



Internal migrants per ward (%)





Photograph by Clive Hassall

When the index is broken down, a slightly different picture emerges. Figure 13 shows that the distribution of wards with high proportions of internal migrants is uneven in core and peripheral areas. The parts of the city of Tshwane that lie in the core are notable for

the relatively high proportion of internal migrants compared to other parts of the core. There are some differences in the core and periphery between the proportions of migrants from the various provinces (Table 6).

Table 6: Origins of residents born in other provinces, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

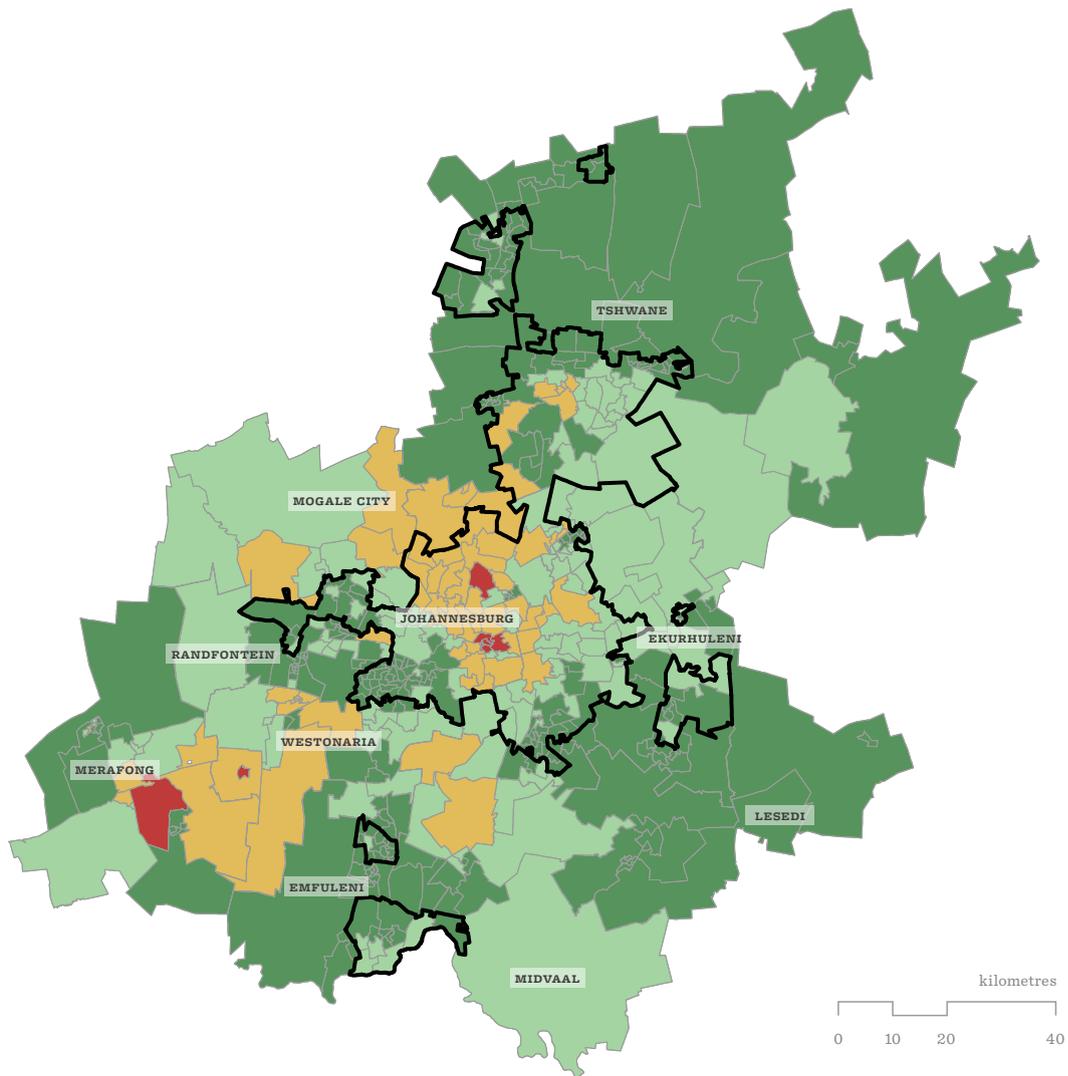
	Western Cape	Eastern Cape	Northern Cape	Free State	Kwa-Zulu-Natal	North West	Mpumalanga	Limpopo
Core	4	12	2	10	19	8	14	31
Periphery	1	16	2	13	15	11	13	30

With the exception of the mining areas of the West Rand, cross-border or international migrants are most likely to form higher proportions of the population of wards located in the core (Figure 14). There are differences in the origins of cross-border migrants found in core and peripheral areas: in peripheral areas there are higher proportions of migrants from the Southern African Development Community

(SADC), while in core areas of the province there are higher proportions of migrants from the rest of the continent outside the SADC and elsewhere in the world (Table 7). The high proportions of migrants from SADC countries in peripheral areas may reflect their more than a century long association of migrants with working in the gold mining and agricultural sectors.

Figure 14: Population born outside South Africa per ward (%)

SOURCE: Census, 2011



Population born outside South Africa per ward (%)



Table 7: Regions of birth of international migrants, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	SADC	Rest of Africa	United Kingdom and Europe	Asia	North America	Latin America and Caribbean	Oceania
Core	74	12	7	5	1	0.5	1
Periphery	90	5	2	2	0.1	0	0.1

Mobility is associated with peripherality, yet Gauteng and its metros, the richest province and the core of the country, have the most mobile populations in South Africa (Table 8). Tables 8 and 9, and Figure 15, showing people over the age of 10 years who moved to their place of dwelling between 2001 and 2011, demonstrate how mobile the population of the province is. These moves may have been within the province, from another province, or from another country. Moves of internal and international migrants may just have been within the province. Notable is that of those who were born

in South Africa, in the decade 2001–2011, people who were born in Gauteng were the most likely to have moved home. And, nearly three quarters of the people in Gauteng who were born outside South Africa, moved in the same decade. This is likely to reflect the rates of cross-border migration to the province, particularly from the SADC, and more specifically from Zimbabwe, over the past decade, the impact of the xenophobic violence in the province of 2008, as well as residential mobility within the province.

Table 8: Residents aged 10+ years who moved to dwelling between 2001 – 2011, major metros (%)

SOURCE: Census, 2011

Metro	
City of Johannesburg (Gauteng)	38
City of Tshwane (Gauteng)	38
Ekurhuleni (Gauteng)	32
City of Cape Town (Western Cape)	31
eThekweni (KwaZulu-Natal)	20

Table 9: Residents aged 10+ years who moved to dwelling between 2001 – 2011 by place of birth, Gauteng, 2011 (%)

SOURCE: Census, 2011

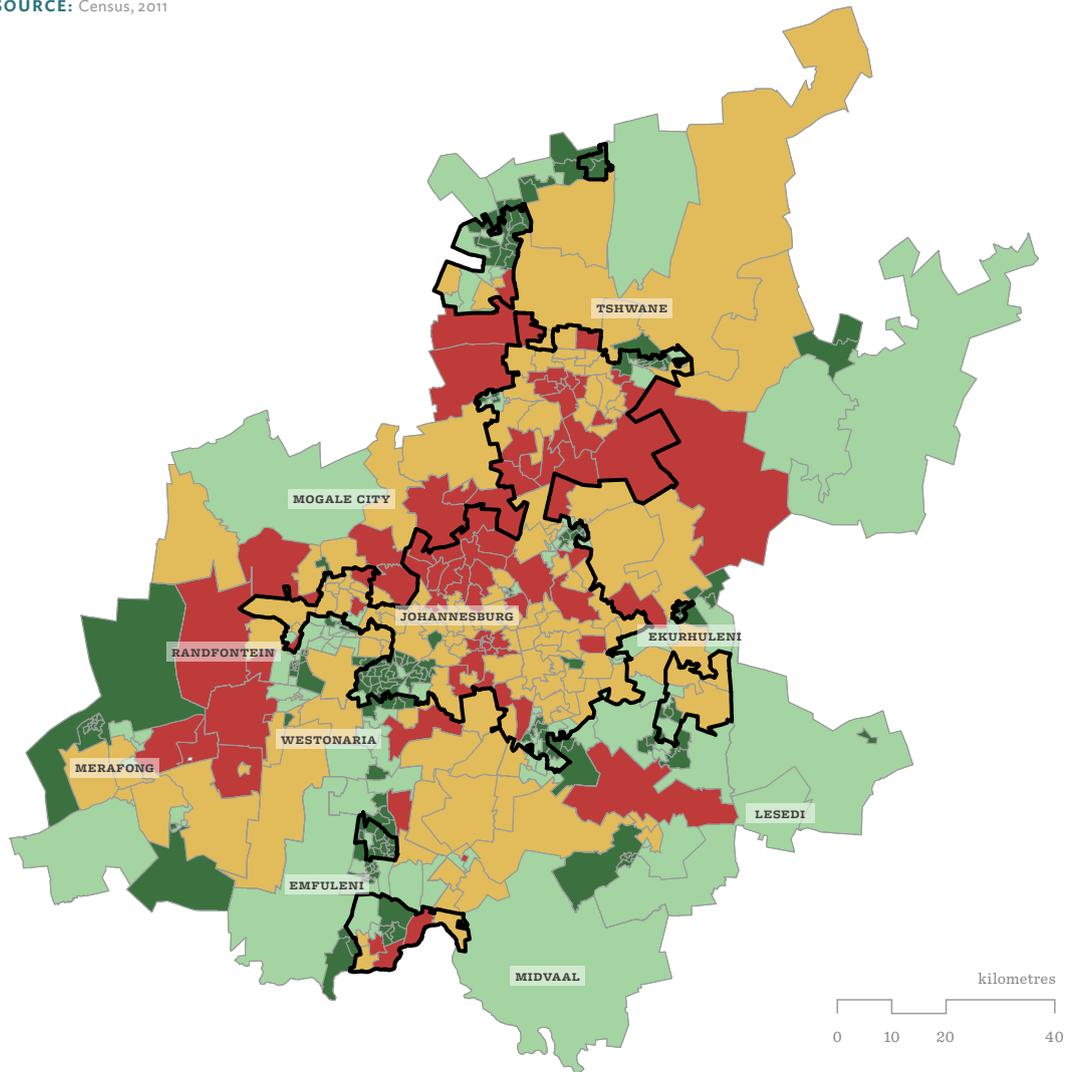
Western Cape	Eastern Cape	Northern Cape	Free State	Kwa-Zulu-Natal	North West	Gauteng	Mpumalanga	Limpopo	Outside South Africa
20	19	20	18	15	19	25	16	19	72

Photograph by Clive Hassall

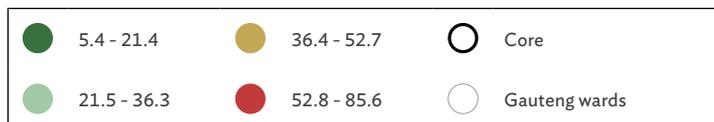


Figure 15: Proportion of residents aged 10+ years who moved to dwelling between 2001-2011, Gauteng, 2011

SOURCE: Census, 2011



Proportion of residents per ward who moved to dwelling between 2001-2011



“The high rate of mobility, particularly of those born in Gauteng, may reflect changing housing opportunities and new government housing developments.”

Figure 15 shows how township areas, often located in the core, but peripheral in other ways, have some of the least mobile populations. This applies, in particular, to the established townships of Alexandra, Soweto, Mamelodi, Soshanguve and Sharpeville (Figure 15). Similarly, swathes of the periphery show a largely immobile population, particularly on the spatial boundaries of the province, including the old homeland areas on the north-western border. When a binary analysis was undertaken using Census 2011 data, 37 per cent of the population of the core aged over 10 years, and 32 per cent of the periphery, had moved dwelling between 2001 and 2011. The high rate of mobility, particularly of those born in Gauteng, may reflect changing housing opportunities and new government housing developments. However, it could also relate to other kinds of mobility and the many reasons people move home.

South Africa has a long history of internal and cross-border labour migration to support the extraction of commodities like gold, as well as other secondary economic activities. Crudely put, apartheid engineered a system where black workers were forced to live in labour reserves and travel to urban or other areas where their labour was required. The demise of apartheid has ostensibly allowed people to live wherever they want to (income and opportunities permitting) and to

move to urban areas to explore economic and other opportunities. Thus, the cheap labour force of the wider national periphery has been able to come to the doorstep of capital located in the core of Gauteng. Peripheral areas in the province, which still act as sources of labour for the core, also show high rates of in-migration.

4.2 Changing dynamics of migration

Gauteng is the epicentre of migration in South Africa and over half (52 per cent) of the population growth between 2001 and 2011 was through in-migration (StatsSA, 2013: 12). When the cities of Johannesburg and Ekurhuleni are compared with two other metros in the country, Gauteng's focus as the destination for migrants is evident. In 2011, 47 per cent of the population of Johannesburg and 45 per cent of the population of Ekurhuleni was internal or international migrants. However, only a third of the population of Cape Town (27 per cent internal, and 6 per cent international migrants), and 13 per cent of the population of eThekweni (10 per cent internal, and 3 per cent international migrants) had been born outside those provinces (Census, 2011). Internal migration to the province and the GCR has been growing, particularly between 1996 and 2001, and has continued steadily.

Table 10: Regions of birth of international migrants, Gauteng, 2015 (%)

SOURCE: Census, 1996, 2001, 2011 (Quantec)

	SADC countries	Rest of Africa	Europe	Asia	North America	Central and South America	Australia and New Zealand
1996							
Core	47	4	38	4	2	4	1
Periphery	91	0.4	6	1	0.2	1	0.1
2001							
Core	57	9	27	4	2	1	0.6
Periphery	92	1	5	1	0.2	0.3	0.1
2011							
Core	78	9	6	6	0.1	0.4	0.3
Periphery	92	3	2	3	0.0	0.1	0.1



Photograph by Kamogelo Mokoena

“Theories of uneven development do not engage sufficiently with the relationship between urbanisation and migration, and core and peripheral areas. Yet, in Gauteng, it is possible to see how, as the core of South Africa’s economy the province and the city-region attract migrants, enabling the growth of a cheap labour force on the doorstep of capital.”

Patterns of cross-border migration to the province have changed considerably since 1996 (Table 10). There has been a significant increase in migration from other African countries, particularly to the core. The largest increase has been in the numbers of southern Africans in the province. In peripheral areas, the proportion of cross-border migrants born in SADC countries has barely changed since 1996, despite declining employment levels of SADC nationals on the gold mines. In the core areas of the GCR, however, the proportion of SADC nationals rose from less than half of cross-border migrants (47 per cent) in 1996, to over three quarters (78 per cent) in 2011. Part of this proportional increase can be ascribed to a fall in the numbers of migrants born in Europe, who constituted 38 per cent of cross-border migrants in 1996, but only 6 per cent in 2011. Their numbers may have fallen owing to emigration, migration to other parts of South Africa, and death (an aging population). However, most of the change can be ascribed to new patterns of migration.

Since 1996, there has been a notable increase in the presence of people born in the rest of Africa, beyond the SADC. The proportion of nationals from the rest of the continent outside the SADC doubled in core areas between 1996 and 2001 (Table 10). Cross-border migrants from outside the SADC, including people from the rest of Africa and the Indian subcontinent and Asia, began moving to peripheral areas between 2001 and 2011 (Table 10).

Theories of uneven development do not engage sufficiently with the relationship between urbanisation and migration, and core and peripheral areas. Yet, in Gauteng, it is possible to see how, as the core of South Africa’s economy the province and the city-region attract migrants, enabling the growth of a cheap labour force on the doorstep of capital. At the same time, the legacy of apartheid labour practices, particularly the circular migratory labour system, persists in the mining fields of the West Rand, where the mining sector attracts and employs (mainly) men from other provinces, particularly the Eastern Cape, on short-term contracts. Workers from outside South Africa are not able to bring their families with them. Circular migration is also practiced by other international and internal migrants in the GCR and Gauteng. Thus, it is possible to see how the “spatial relations of production or the center–periphery structure” are not “separate and independent from the social relations of production” (Soja, 1980: 209).

The peripheral areas of the city-region, whether located outside the core or within the core, are home to new migrants, whether internal or cross-border, as well as to sections of the historically-disadvantaged black population born in the province. These residents are usually located in the old township areas of Gauteng, or in new informal settlements and RDP housing developments on the edges of cities, and sometimes in the urban core

5. Education

5.1 Uneven access to education

Education has an impact on the employment and income-earning opportunities of individuals and the development capacity of an area. Educational opportunities are not always distributed equally, however. Areas where there are poor distributions of schools, weak schools, poor attendance at school, long distances travelled to school, low levels of education, and little access to institutions of higher education, are likely to be peripheral.

Gauteng is home to many institutions of higher education (HEIs). Four public universities lie within the boundaries of the province – the universities of Johannesburg, Pretoria, South Africa (Unisa) and the Witwatersrand – as well as the Vaal campus of North-West University, two universities of technology (Tshwane and Vaal), eleven further education and training (FET) colleges, and a private university. In 2010, there were also 60 private education colleges in the province (Nyar, 2013: 4). The main campuses of all of these institutions are located in the core of the GCR (Nyar, 2013). In addition, owing to institutional mergers, the University of Johannesburg also has campuses on the East Rand and in Soweto, and the University of Pretoria also has a campus in Mamelodi, essentially peripheral areas in the core of the province. Unisa is primarily a distance-learning

institution for people from all over the province, as well as in the rest of the country and elsewhere in the world. Three FET colleges are located in the periphery (but on the edge of the core) in Klerksdorp, Randfontein and Springs.

Excluding Unisa (on the grounds of it being a distance-learning institution), in 2010, 26 per cent of South Africa's undergraduate students, and 37 per cent of the country's postgraduate students, studied in the GCR (Nyar, 2013: 5). The GCR was also home to 49 per cent of the country's academic staff in 2010 (Nyar, 2013: 11). The National Research Foundation's South African Research Chairs Initiative (SARChI) promotes research and development in universities. Between 2006 and 2012, 152 research chairs were appointed nationally, of which 47 were allocated in Gauteng (GCRO, 2013b). The concentration of HEIs and investment in research chairs in Gauteng is reflected in, and perhaps reflects, its core status when considered on a national scale. However, the investment does not reflect the contribution of the province to national GDP (33 per cent) and the proportion of business (58 per cent) and government (23 per cent) investment in research and development in the province (GCRO, 2013a).

Table 11: Highest level of education, Gauteng, 2011 (%)

SOURCE: Census, 2011

	No schooling	Some primary	Completed primary	Some secondary	Completed secondary	Certificate or diploma	Tertiary degree or post-graduate diploma	Higher degree (Masters/PhD)
Core	3	16	4	29	30	11	6	1
Periphery	5	21	5	35	24	7	3	0,4



Photograph by Christian Scriba

A binary analysis of Census 2011 data shows that there were differences in the highest educational level achieved by residents of the areas demarcated as core and peripheral in Gauteng. Residents in the periphery were more likely to have no schooling and just over a quarter had only some primary schooling or had completed primary school (26 per cent), compared to a fifth (20 per cent) in the core (Table 11). Residents in the periphery were less likely to have completed high school. They were also less likely to hold a certificate or diploma or have any other kind of tertiary education (10 per cent in the periphery and 18 per cent in the core).

Census 2011 data on school attendance showed that pre-school attendance was lower in peripheral

areas (79 per cent) compared to the core (84 per cent) (Table 12). Rates of attendance at school were slightly lower for children aged 13 to 18 years in peripheral areas, although the differences were not great (Tables 12 and 13). The figures for school attendance in the core are distorted by the higher proportion of youth in the core in tertiary education, which shrinks the proportions in other forms of education in the core. Table 12 shows that school attendance in core and peripheral areas is similar, with the exception of pre-school. Thus perhaps the unevenness seen in the highest levels of education achieved in core and peripheral areas might even out in future, notwithstanding the concentration of HEIs in the core.

Table 12: Age in completed years and present school attendance, Gauteng, 2011 (%)

SOURCE: Census, 2011

	1 - 5 years	6 - 12 years	13 - 18 years	19 years
Core	84	96	90	60
Periphery	79	96	89	51

Photograph by Patrik Göthe



Table 13: Type of educational institution attended, Gauteng, 2011 (%)

SOURCE: Census, 2011

	Pre-school including day care; crèche; Grade R; Pre-Grade R in an ECD centre	Ordinary school including Grade R learners at a formal school; Grade 1-12 learners and learners in special classes	Special school	Further education and training college (FET)	Other college	Higher educational institution university/ university of technology	Adult basic education and training centre (ABET)
Core	2	68	0.7	6	3	19	2
Periphery	1	80	0.7	4	2	10	2

Many learners in many densely-populated parts of peripheral areas, as well as those in less densely-populated areas, have to travel long distances to school (Figures 16 and 17). Long journeys are particularly arduous for children in primary school. Many of these schools may be large and may be overcrowded to accommodate the number of learners in the catchment area. Figure 18 shows that although some high-performing secondary schools are found in peripheral

areas, they are more likely to be found in the core. Conversely, the periphery is slightly more likely to be home to under-performing secondary schools. These experiences appear to be reflected in the satisfaction of residents with their local educational facilities. Only 62 per cent of residents in peripheral areas, and 73 per cent in core areas were satisfied, while 20 per cent in the periphery and 13 per cent in the core were dissatisfied.

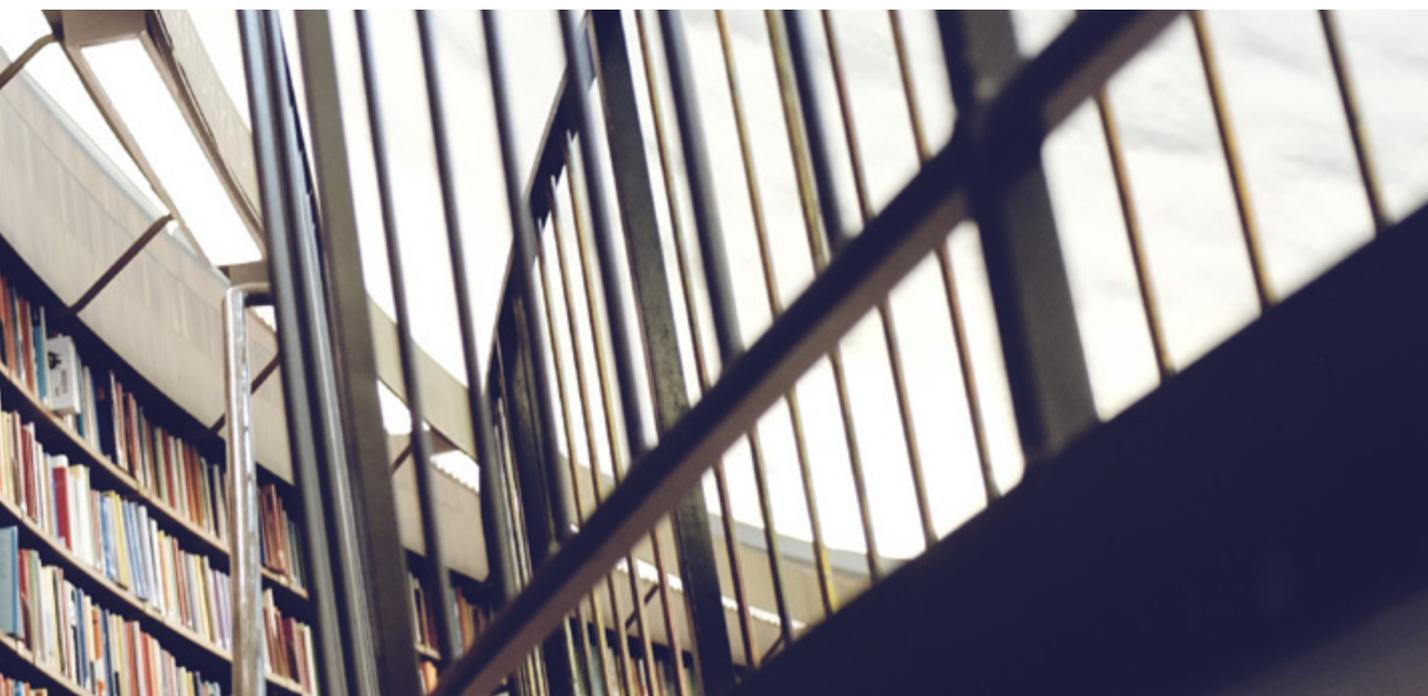
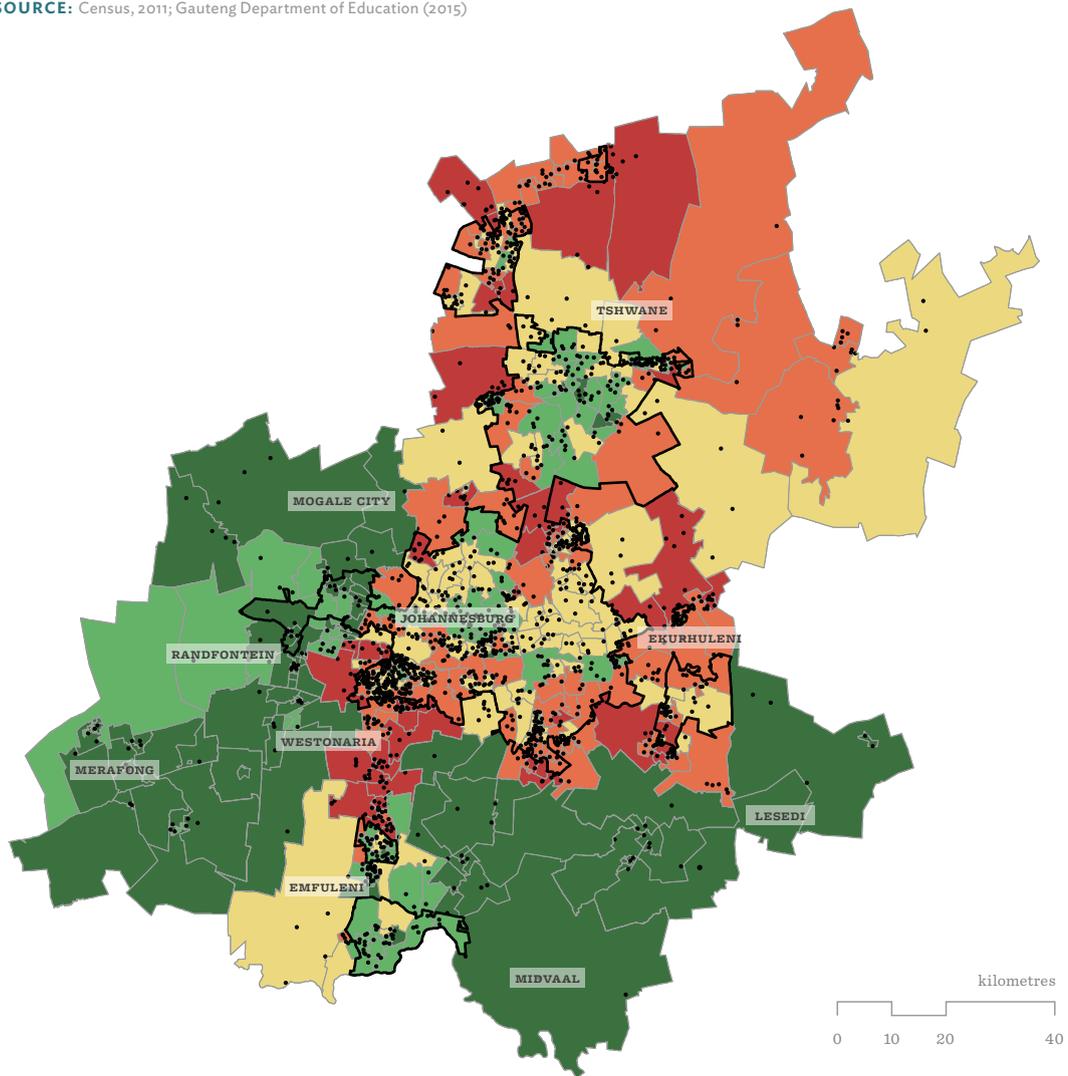


Figure 16: Distribution of primary schools in Gauteng and distribution of the population aged between 6 and 18 years

SOURCE: Census, 2011; Gauteng Department of Education (2015)



Population aged between 6 and 18 years and primary schools in Gauteng (2015)

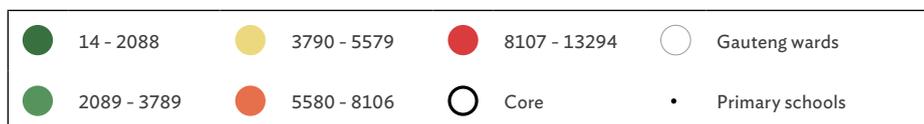
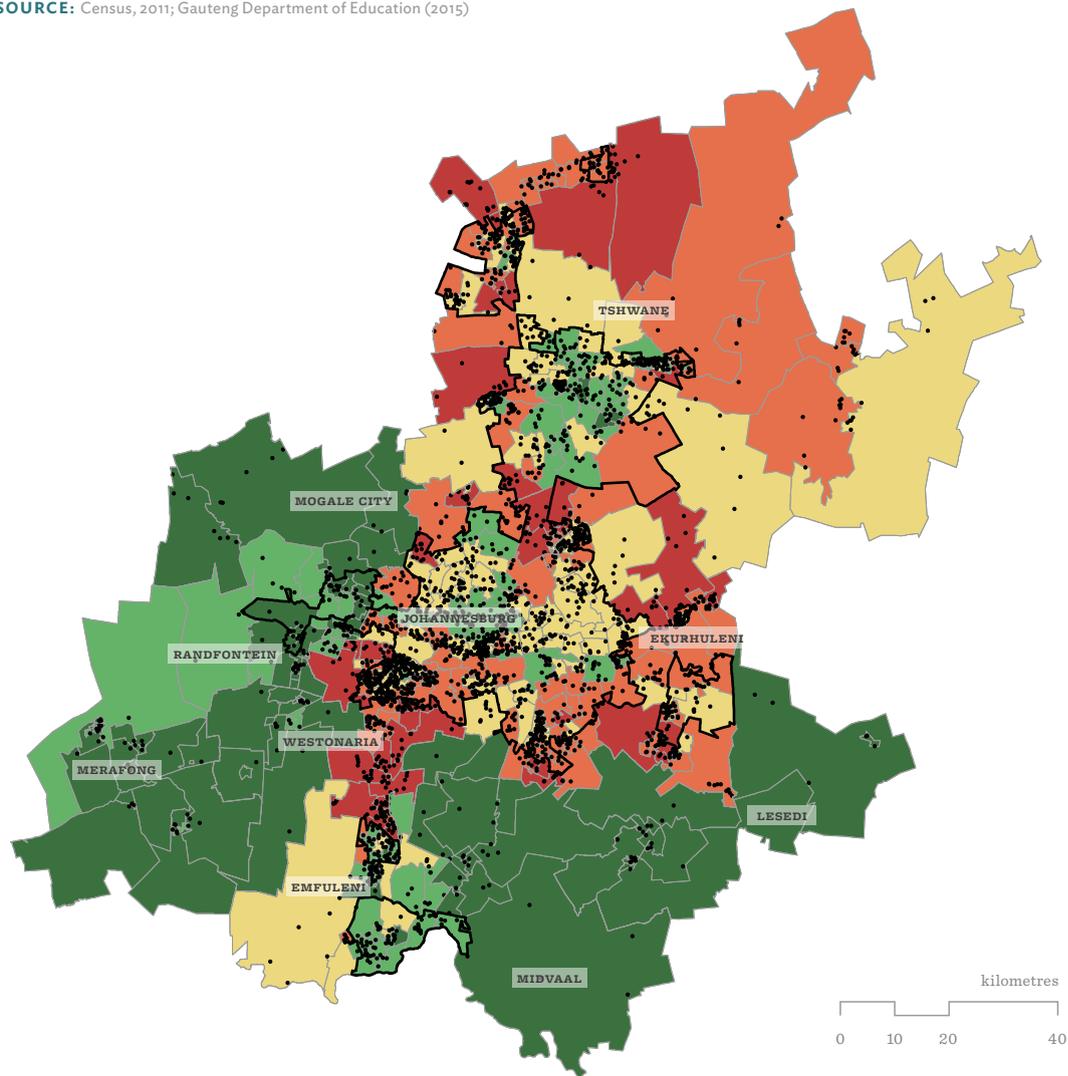


Figure 17: Distribution of all schools in Gauteng and distribution of the population aged between 6 and 18 years

SOURCE: Census, 2011; Gauteng Department of Education (2015)



Population aged between 6 and 18 years and all schools in Gauteng (2015)

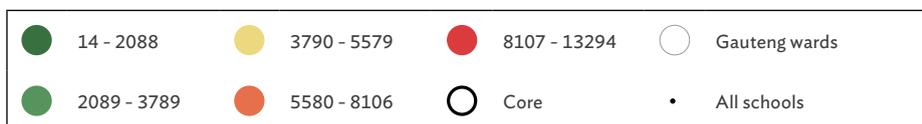
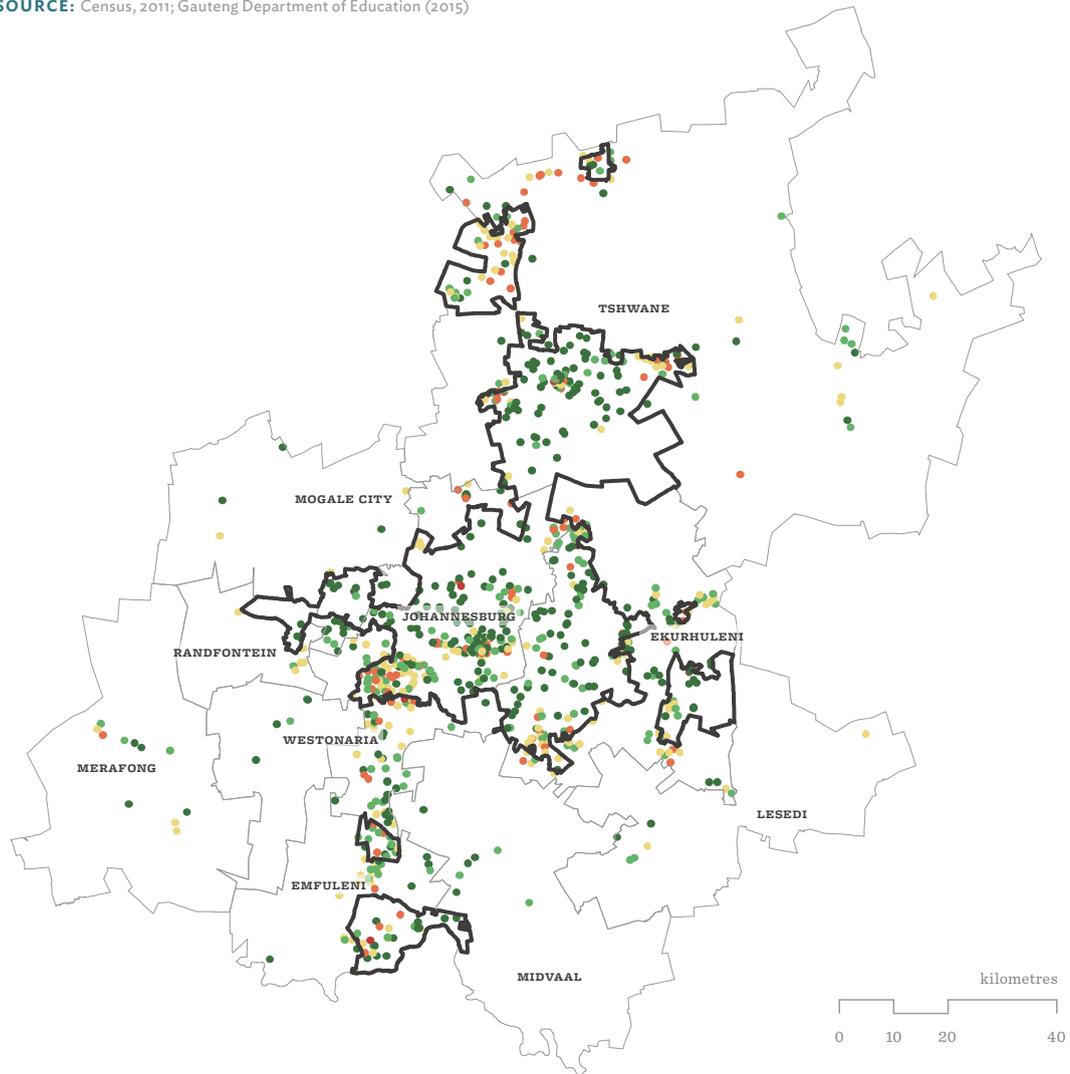
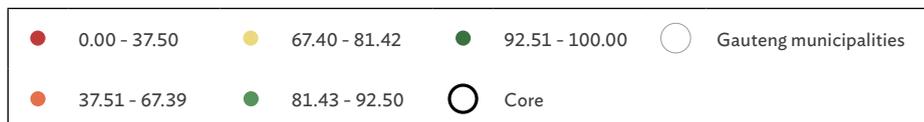


Figure 18: Distribution of secondary schools in Gauteng with 2015 NSC examination pass rates

SOURCE: Census, 2011; Gauteng Department of Education (2015)



2015 NSC pass rate (%)



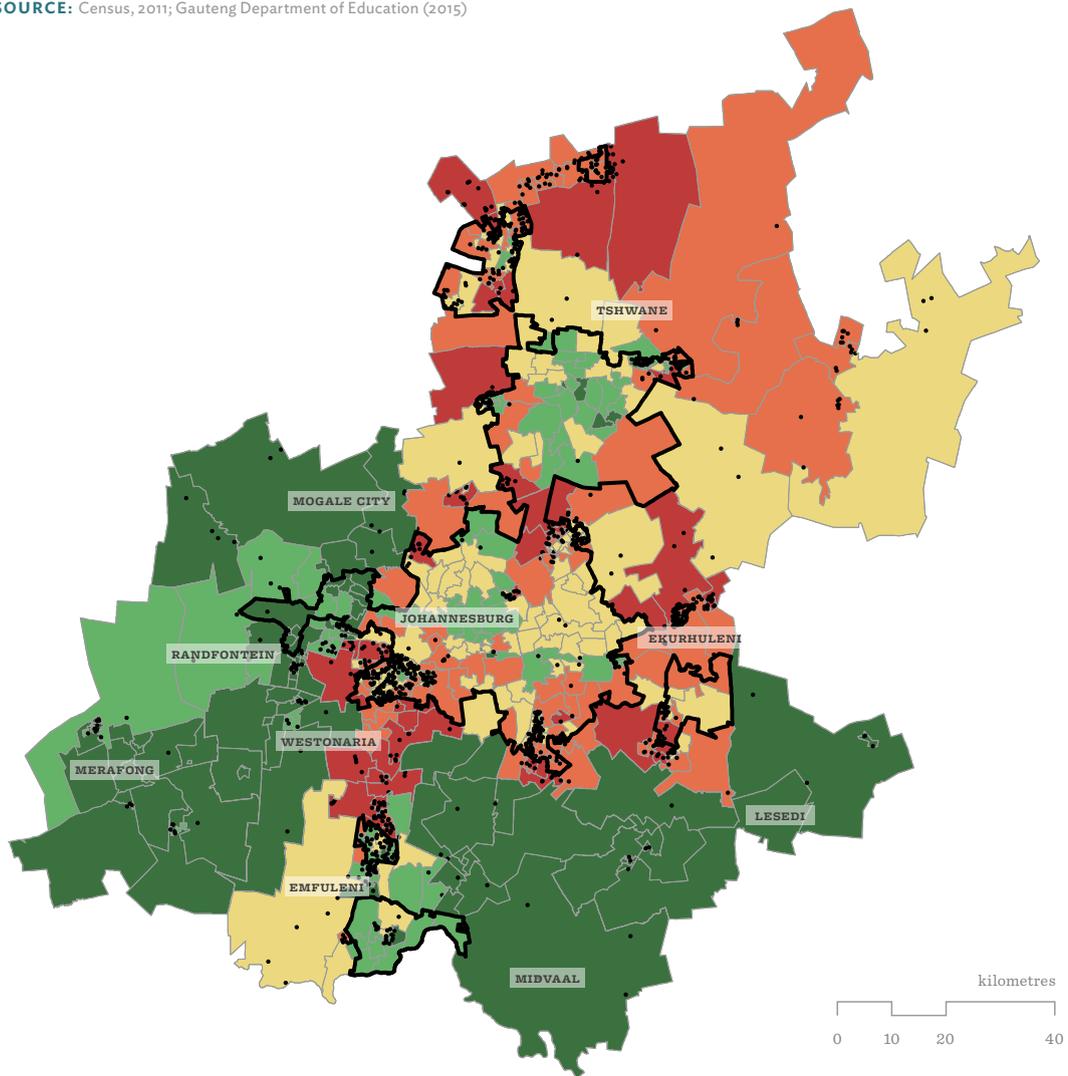
In South Africa, most state-run schools charge attendance fees. However, some schools are designated no-fee schools, to accommodate children whose parents are unable to pay school fees. These schools are found in parts of the periphery. In the core, they are located mainly in those areas which are considered socio-economically peripheral, mainly townships, informal settlements and former homeland areas (Figure 19). Independent schools are firmly located in the core (Figure 20).

Photograph by Clive Hassall



Figure 19: Distribution of no-fee schools in Gauteng and distribution of the population aged between 6 and 18 years

SOURCE: Census, 2011; Gauteng Department of Education (2015)



Population aged between 6 and 18 years and no-fee schools in Gauteng (2015)

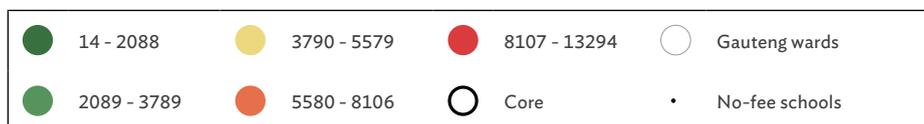
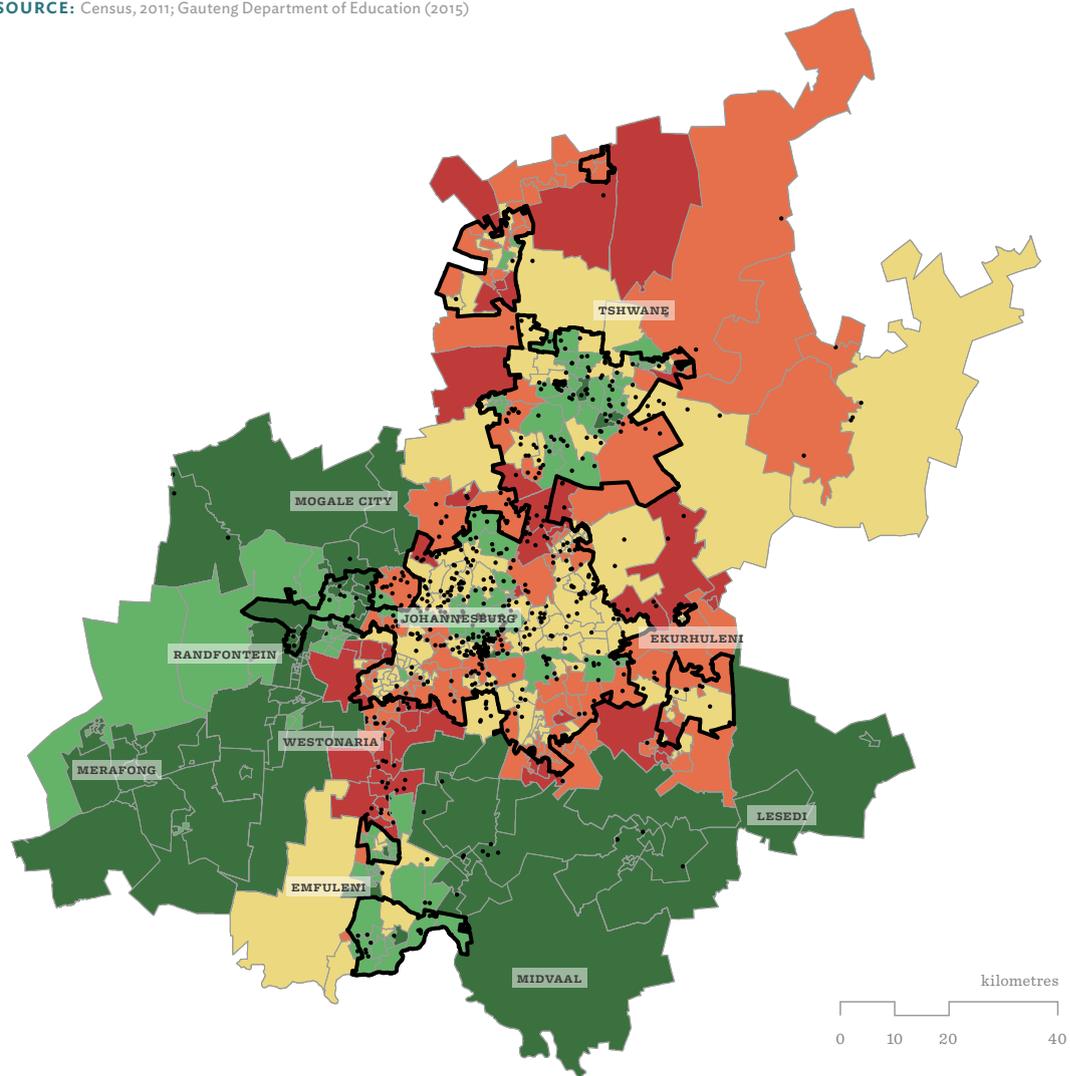
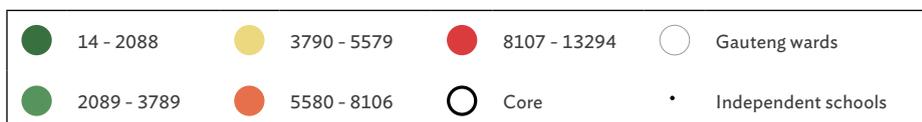


Figure 20: Distribution of independent schools in Gauteng and distribution of the population aged between 6 and 18 years

SOURCE: Census, 2011; Gauteng Department of Education (2015)



Population aged between 6 and 18 years and independent schools in Gauteng (2015)



Lack of education is a problem for the individuals concerned as it affects their employment and earning capacities, but it also has other implications. Low levels of education affect the human capital of an area, and the scope to create particular kinds of employment in particular places. Areas with an educated population are more likely to attract investment in skilled and higher-paid employment, which is the focus of city-region and provincial investment and economic development plans for research and innovation hubs (GPG, 2011). This can perpetuate uneven development as peripheral areas are more likely to be seen as the places to locate primary sector, low-paid employment, and/or to be considered as low-paid labour reserves for core areas, while core areas attract investment in highly-skilled labour, and attract skilled labour to participate in tertiary economic activities, and they grow as a result.

5.2 Changes in education

Perhaps one of the most significant changes in both core and peripheral regions of the GCR since 1996 is the massive improvement in the levels of education achieved in the province. The proportion of the population with no schooling has fallen dramatically, particularly in peripheral areas (from 17 per cent in 1996 to 5 per cent in 2011 in the periphery, and from 12 per cent to 3 per cent in the core) (Table 14). The number of residents in the periphery with some secondary education has grown from a quarter to over a third. While only 13 per cent of people in peripheral areas had completed secondary school in 1996, almost a quarter had done so by 2011 (Table 14). The number of people with tertiary education doubled. Improvements were also seen in the core, particularly in higher education. Although there has been a significant improvement in the educational levels achieved by residents in Gauteng – whichever part of the province they live in – by 2011 only 29 per cent of residents in the core and 24 per cent in the periphery had completed secondary school. Furthermore, only 18 per cent in the core and 10 per cent in the periphery had any form of tertiary education (Table 14).



Photograph by Nzolo Bidla

Table 14: Highest level of education, Gauteng, 1996, 2001, 2011 (%)

SOURCE: Census, 1996, 2001, 2011 (Quantec)

	No schooling	Some primary	Complete primary	Some secondary	Grade 12/Std 10	Higher
1996						
Core	12	24	9	26	20	9
Periphery	17	31	10	25	13	4
2001						
Core	8	19	6	31	24	11
Periphery	12	26	7	33	17	5
2011						
Core	3	16	4	30	29	18
Periphery	5	21	5	35	24	10

Transformation in education in the GCR since 1994 has been taking place in other ways as well. There has been an increase in enrolments at institutions of higher education, although it is not possible to know where the students come from (Nyar, 2013: 8). This has been accompanied by transformations in the student body. In 1995, black African women and men comprised only 19 per cent and 20 per cent, respectively, of students enrolled in universities (Nyar, 2013: 10). By 2010, 40 per cent of students enrolled in universities in the GCR were black African women, but black African men comprised only 29 per cent of enrolled students (Nyar, 2013: 10).

The improvement in the highest education levels achieved in the periphery, as well as similarities in enrolment levels for specific age groups, indicates that

this aspect of uneven development is being addressed. So, although disparities between core and peripheral areas continue, they are not as stark as they were in the past. However, the distribution of schools and location of low and high-performing schools indicates that many students in the periphery have to travel far to get an education, in what may be an underperforming and overcrowded school. Although the population of the province is increasingly educated, the low proportion of the population that has completed secondary school challenges the state's plans to promote high-skilled economic development. If these plans succeed, the less educated portion of the population, who are more likely to live in peripheral areas and socio-economically peripheral areas within the core, are likely to be excluded.

6. Employment and income

Economic indicators were used to identify core and peripheral areas. World system theory and network theorists (Wallerstein, 1974, 1979; Soja, 1980; Smith, 1986, 1997; Etherington and Jones, 2009; Pileček and Jančák, 2011) argue that peripheral areas act as labour-force reserves for core areas, supplying cheap labour, often in the form of migrants, or as locations where commodities are extracted using low-paid labour. In a global economy, peripheral areas are places where goods can be manufactured with low labour costs, for export, enabling higher rates of capital accumulation (Smith, 1986, 1997).

The association of core areas with secondary and tertiary sector economic activities, and peripheral areas with primary sector activities, obviously affects employment opportunities and profiles. Peripheral areas are also associated with having lower incomes and insecure employment, as well as higher rates of unemployment than in the core. The peripheral areas of Gauteng are home to mining and agricultural activities,

and the core is home to secondary and tertiary level activities.

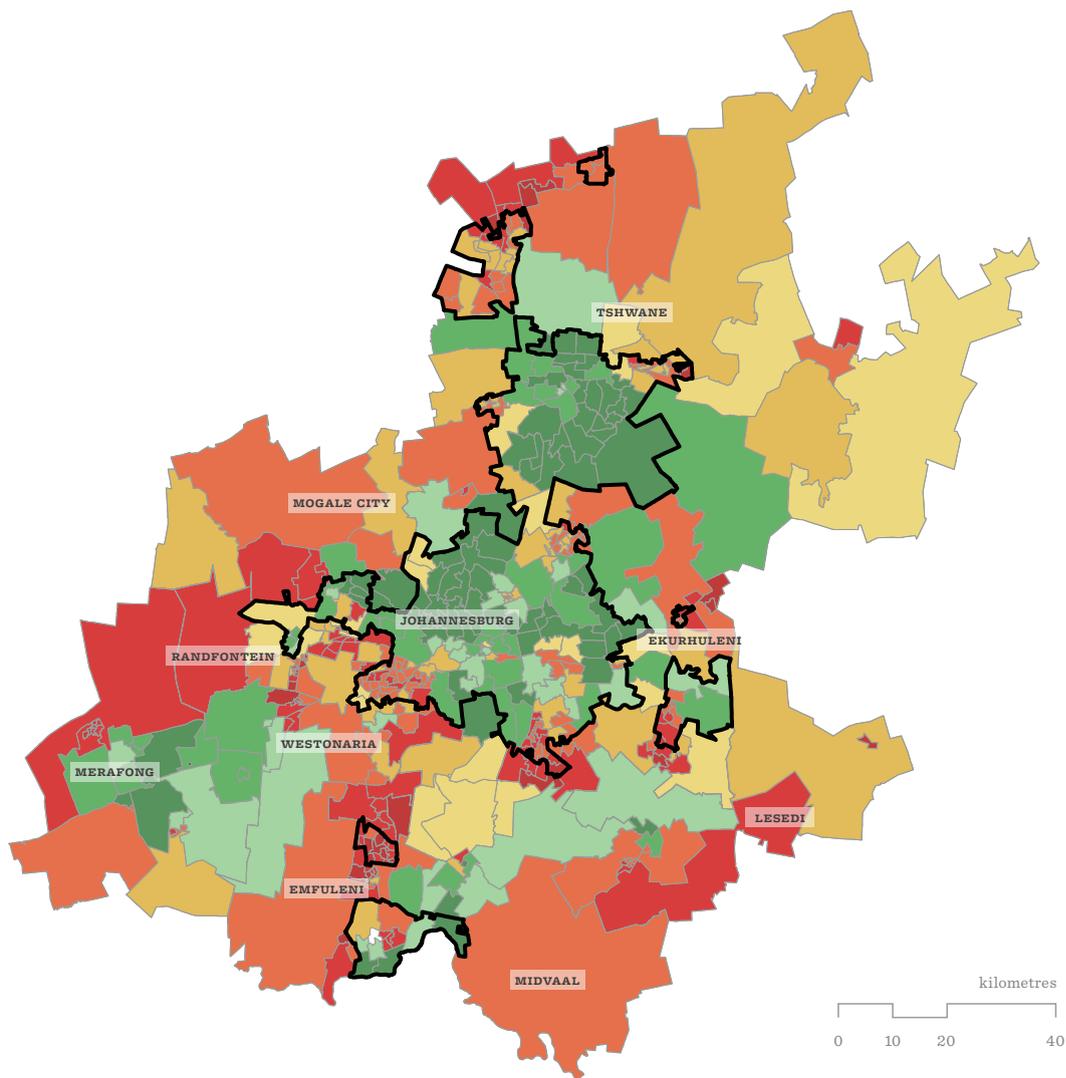
An index of employment and income was created and mapped to see which areas of Gauteng are peripheral in regards to employment and income (Figure 21). The index included the proportions of individuals earning between R0–R1 600 per month, adults employed in the informal sector, in private households, and those who were unemployed, per ward. These indicators were chosen because informal sector participation suggests an inability to get work in the formal sector. Working in private households suggests insecure employment, and low incomes indicate employment vulnerability or unemployment. As data for the sector of GVA had been used to define core and peripheral areas, and because comparable Census 2011 data was not available, data on sector of employment was not included. The income and employment index clearly shows that peripheral areas are proportionally more likely to be home to people working in insecure sectors and with no or very low incomes (Figure 21).

Photograph by Simphiwe Tshabalala

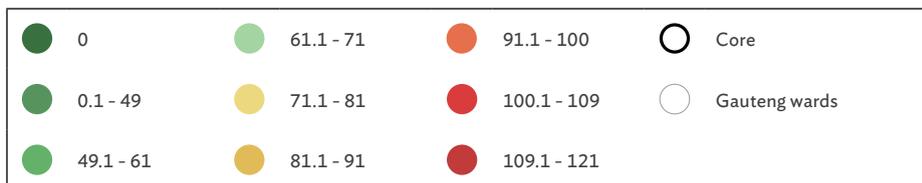


Figure 21: Income and employment index

SOURCE: Census, 2011



Income and employment index



“...although the province is the core of the country and it contains a clear economically-defined core, the cheap labour force needed for capital accumulation is located in peripheral areas on the doorstep of the core, and sometimes within it.”

Areas that are peripheral in terms of income and employment can be found in core areas, particularly on the edges of the core in old township areas. The southwest of Johannesburg (Soweto) and Alexandra, the centre of Ekurhuleni (Wadeville/Reiger Park/Ramaphosa), Katlehong, the northeast of Pretoria, as well as parts of the Vaal Triangle (Emfuleni) on the southern borders of the province, are notable in this regard (Figure 21). This peripheralisation of employment and income reflects apartheid geographies and the location of mainly black African and coloured townships on the edges of cities. There is a swathe of green across the core indicating greater employment and income prospects there (Figure 21). The mining areas of the West Rand are notable for scoring relatively high on the

income and employment index, but are peripheral in many other ways.

6.1 Employment

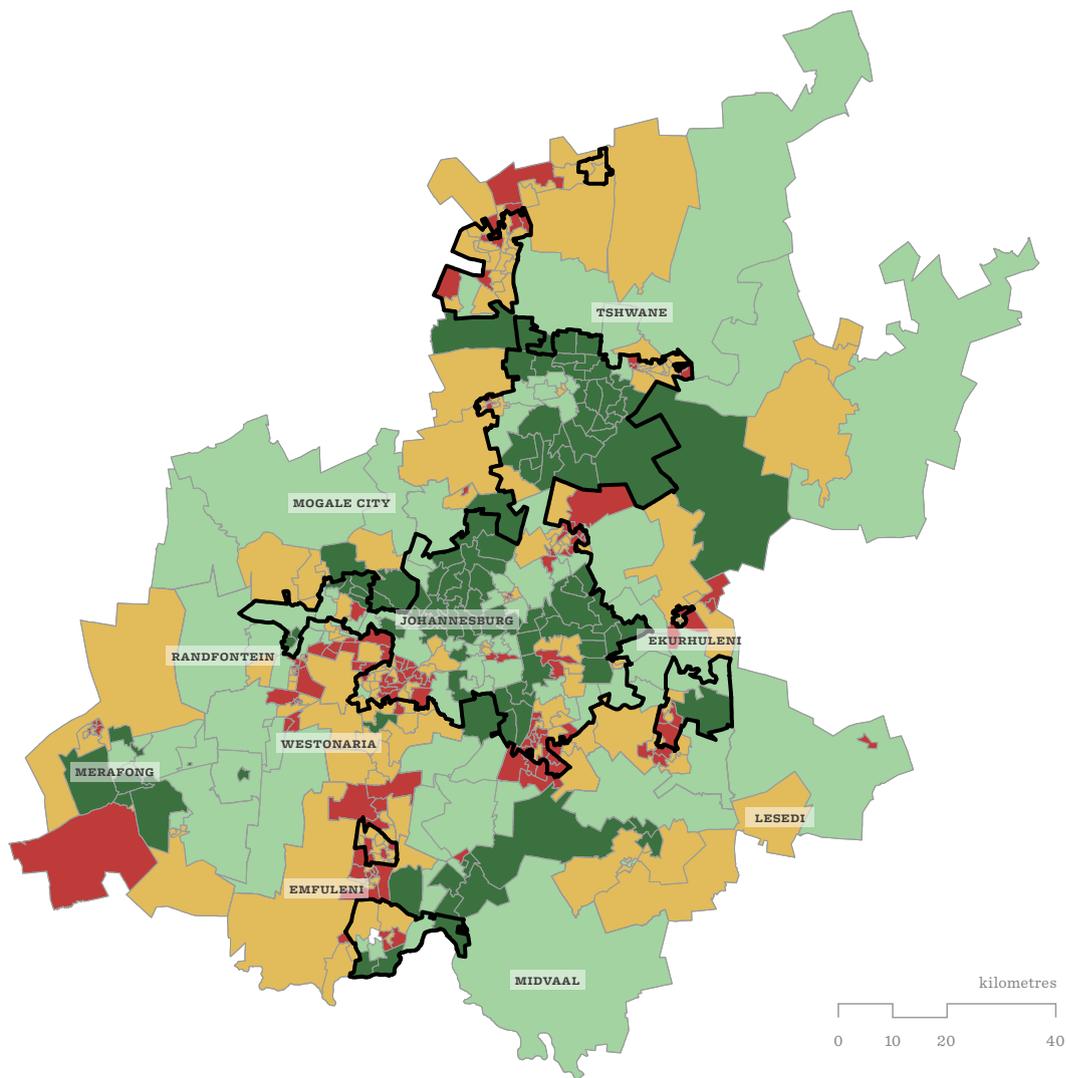
The data shows significant congruity in many areas as regards employment for individuals living in core and peripheral areas. This may be for three reasons. First, peripheral areas, home to black Africans with high rates of unemployment, are located within the core as well as within the wider periphery. Second, residents of the periphery may be employed in core areas. Thus, although the province is the core of the country and it contains a clear economically-defined core, the cheap labour force needed for capital accumulation is located in peripheral areas on the doorstep of the core, and sometimes within it.

Photograph by Papama Tungeli



Figure 22: Population unemployed per ward (%)

SOURCE: Census, 2011



Population unemployed per ward (%)



Unemployment rates are high. Figure 22 shows the legacy of apartheid geographies that forcefully pushed and restricted black residents to townships on the edges of the core where high rates of unemployment are still found. Soweto, Alexandra in Johannesburg, Mamelodi, Midrand and the centre and edges of Ekurhuleni appear as red/orange spaces in the core (Figure 22). Overall, in 2011, a higher proportion of individuals living in peripheral areas was unemployed or discouraged work-seekers (35 per cent, compared to 27 per cent in the core) (Table 15 and Figure 22).

When asked whether it was easier or harder for someone like them to find jobs in 2015 than five years previously, more than seven out of ten respondents said it was harder (GCRO QoL, 2015). However, a higher proportion of residents in the periphery (76 per cent) than in the core (71 per cent), said it was harder. Nearly one in five residents, regardless of where they lived, agreed with the statement that they “are not needed by the South African economy” (GCRO QoL, 2015).

Table 15: Employment status of individuals, Gauteng, 2011 (%)

SOURCE: Census, 2011

	Employed	Unemployed	Discouraged work-seeker
Core	73	23	4
Periphery	66	29	6

Table 16: Sector of employment, Gauteng, 2011 (%)

SOURCE: Census, 2011

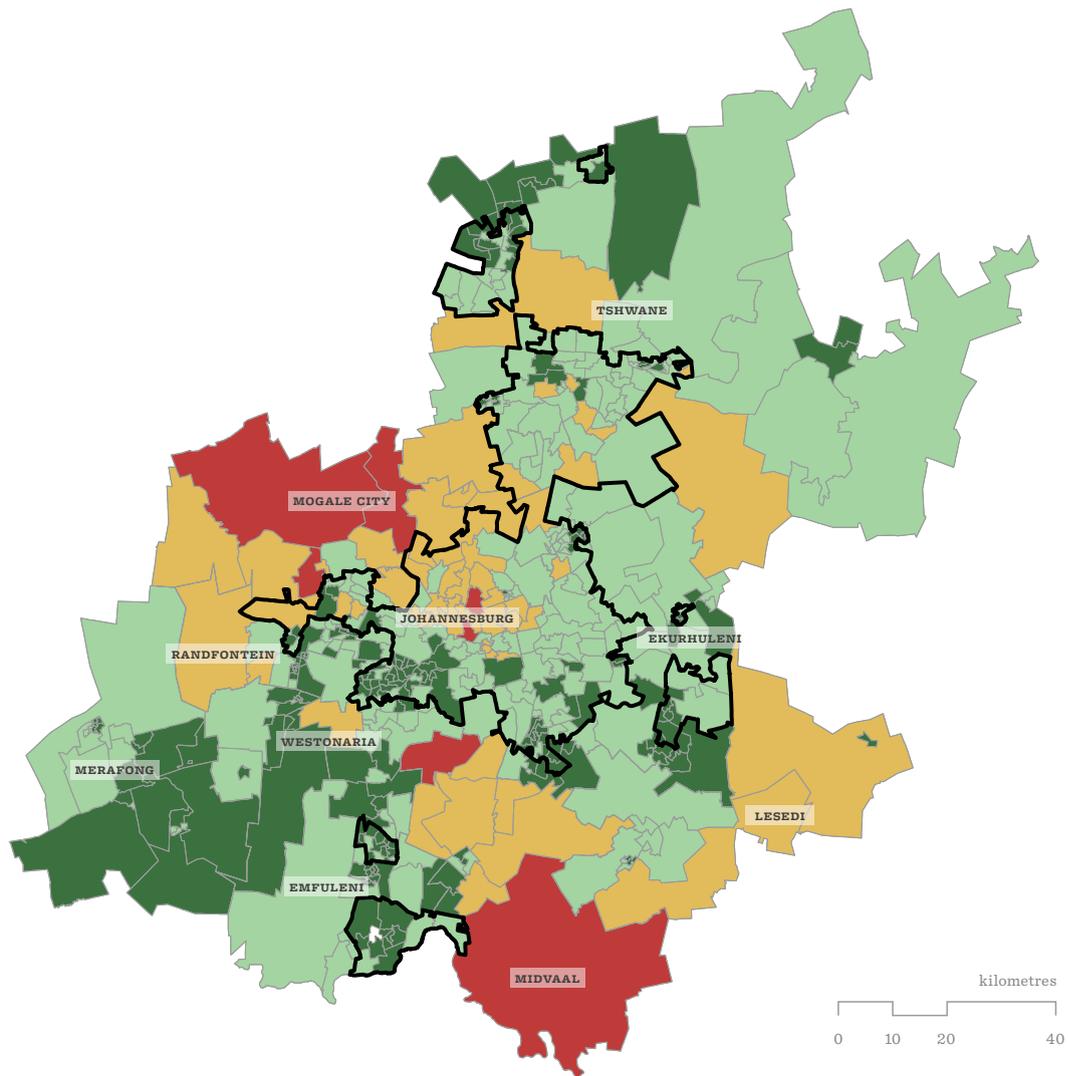
	Formal sector	Informal sector	Private households	Do not know
Core	78	8	12	2
Periphery	74	11	13	2

NOTE: This table represents those in employment.

In terms of type of employment, people in peripheral areas were proportionally more likely to be employed in the informal sector and private households (Table 16 and Figures 23 and 24), both insecure types of employment which usually lack benefits.

Figure 23: Working population employed in private households per ward (%)

SOURCE: Census, 2011



Working population employed in private households per ward (%)

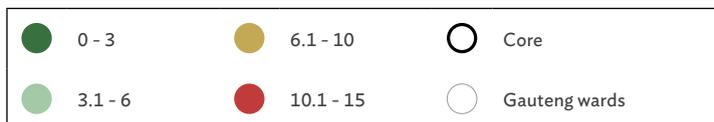
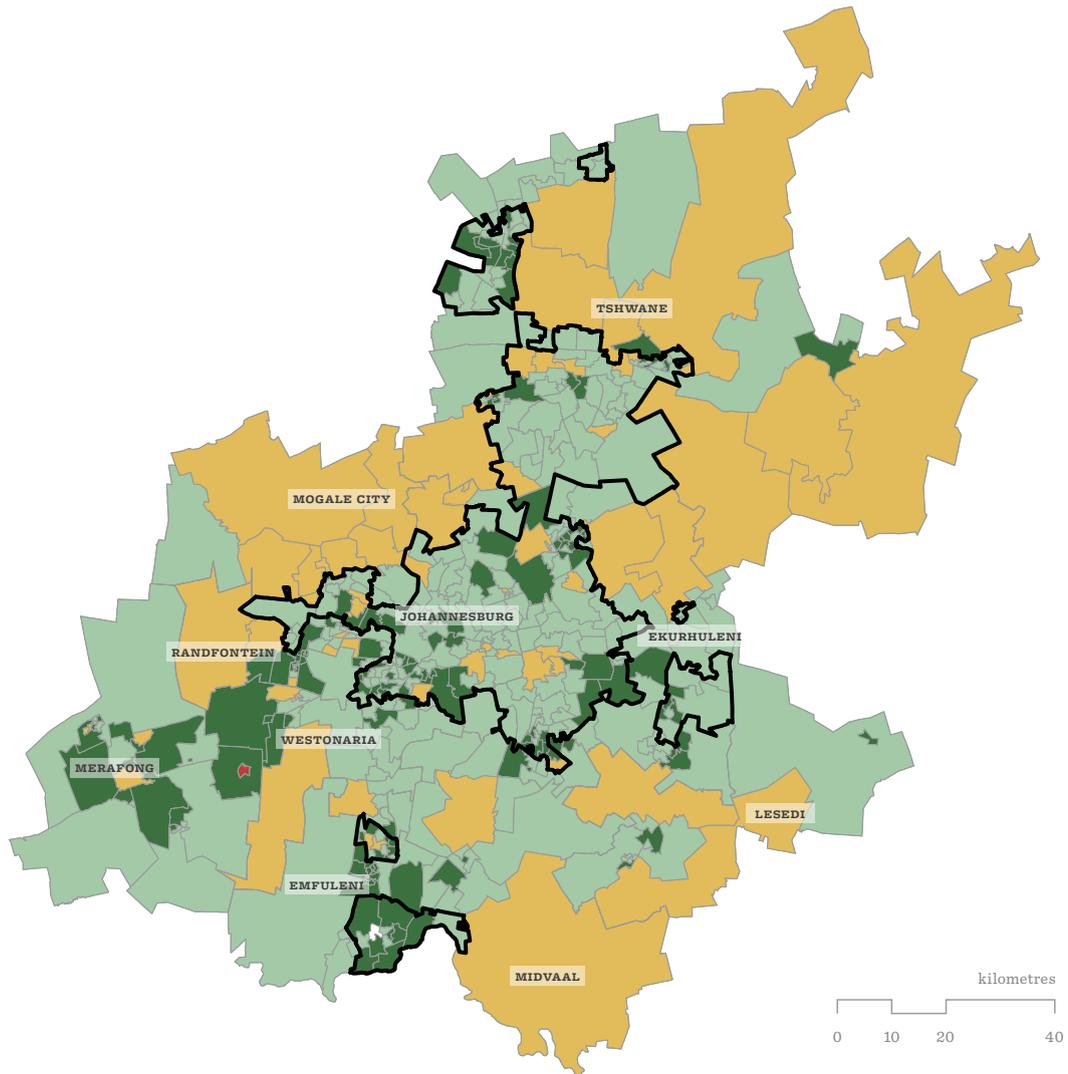


Figure 24: Working population employed in informal sector per ward (%)

SOURCE: Census, 2011



Working population employed in informal sector per ward (%)

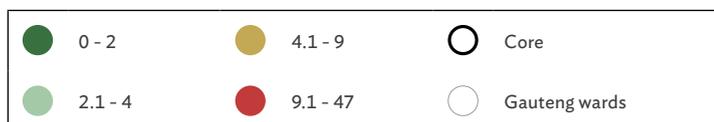


Table 17: Detailed sectors of employment, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Core	Periphery
Agriculture, hunting, forestry and fishing	2	3
Community, social and personal services	6	6
Construction	9	10
Electricity, gas and water supply	4	4
Financial, insurance, real estate and business services	11	5
Manufacturing	10	10
Mining and quarrying	3	7
Private households	11	11
Public sector/government	11	10
Transport, storage and communication	7	6
Wholesale and retail trade	14	13
Other	13	14

Somewhat surprisingly, given the GVA values produced per sector per mesozone, the employment profiles of respondents in the GCRO Quality of Life 2015 survey are not remarkably different (Table 17). However, a higher proportion of respondents in peripheral areas was employed in primary sectors, particularly agriculture and mining and quarrying. A greater proportion of residents in the core was employed in the financial, insurance, real estate and business services sector (Table 17).³ The use of labour brokers may affect the proportion of people employed in the financial and manufacturing sectors (Tregenna, 2007).

6.1.1 Employment conditions

The working conditions of residents in core and peripheral areas interviewed in the GCRO 2013 Quality of Life survey were largely similar (GCRO, 2013a). This challenges most literature which suggests that the working conditions of people in peripheral areas, as a labour reserve, are poorer than in core areas (Smith, 1997; Etherington and Jones, 2009). However, in Gauteng many residents of the periphery work in core areas, and the findings could also reflect South Africa's relatively strong labour laws. There was little difference in the number of hours worked per week (Table 18), but people in the periphery were

3. Census 2011 found a higher proportion of people in Gauteng employed in private households than the GCRO Quality of Life 2015 survey found. The discrepancy is probably due to where and when the interviews took place.

slightly more likely to work shorter weeks, and those in the core, longer weeks. The type of contracts people have is also an indicator of working conditions and job security. The GCRO Quality of Life 2013 survey found that people in core areas were more likely

to have indefinite contracts, while respondents in peripheral areas were more likely to have insecure employment, working without a contract or on fixed-term contracts (Table 19).

Table 18: Hours worked per week, Gauteng, 2013 (%)

SOURCE: GCRO QoL, 2013

	0 - 19 hours	20 - 39 hours	40 hours	41 - 45 hours	46 - 50 hours	51 - 60 hours	61+ hours
Core	6	12	29	25	14	10	5
Periphery	7	14	29	23	13	9	4

NOTE: This question was not asked in the QoL 2015 survey.

Table 19: Type of employment contracts, Gauteng, 2013 (%)

SOURCE: GCRO QoL, 2013

	Indefinite contract	Fixed-term contract	Temporary post through agency	Apprenticeship or training scheme	No contract	Other	Don't know
Core	39	22	2	0.4	26	5	6
Periphery	31	24	3	0.3	31	5	6

NOTE: This question was not asked in the QoL 2015 survey.

Overall, the Quality of Life 2013 survey did not find stark differences in salaries and other employment provisions in core and peripheral areas of Gauteng (Tables 20 and 21). However, respondents living in peripheral areas were slightly less likely to have

medical aid, pensions schemes, and annual bonuses (Table 20). They were also less likely to have access to training and education, paid leave and housing subsidies (Table 21).

Table 20: Salary provisions received, Gauteng, 2013 (%)

SOURCE: GCRO QoL, 2013

	Overtime payments	Medical aid	Pension/provident fund	Performance bonus	Annual bonus/13th cheque cheque
Core	41	31	47	26	47
Periphery	42	27	45	27	40

NOTE: This question was not asked in the QoL 2015 survey.

Table 21: Employment provisions received, Gauteng, 2013 (%)

SOURCE: GCRO QoL, 2013

	Training and education	Paid leave/sick leave	Family leave	Housing subsidy	Transport allowance
Core	57	58	50	16	12
Periphery	55	55	47	15	13

NOTE: This question was not asked in the QoL 2015 survey.

The GCRO Quality of Life 2015 survey did not ask such detailed questions about residents' working conditions. It did ask how satisfied residents were with working conditions in their job. More than one in five (21 per cent) in the core were 'very satisfied' with their working conditions, compared to only 16 per cent in the periphery. Just over half (54 per cent) of residents in the core were 'satisfied', compared with 52 per cent in the periphery. People living in the periphery were more likely to be dissatisfied or very dissatisfied with their working conditions than those in the core (21 per cent and 13 per cent, respectively).

6.1.2 Entrepreneurship

Gauteng, and the City of Johannesburg in particular, are often seen as the hubs of South African business and commerce. The GCRO Quality of Life surveys ask questions about business ownership. In 2013, the survey found 11 per cent of residents in both core and

peripheral areas owned a business. However, reflecting national trends, by 2015 only 8 per cent said they owned a business (Kelley et al., 2016). Business owners who lived in the periphery (72 per cent) were much more likely to operate in the informal sector than those in the core (61 per cent).

About 15 per cent of people in both areas said they had ever tried to start a business. Business owners in the periphery seemed to find it a little harder to make their businesses a success (Table 22). There was relatively little difference in the ages of businesses (Table 23) and no major differences in the sources of start-up capital business owners used (Table 24). Although 29 per cent of business owners in the core and 25 per cent in the periphery knew of government departments or services that provided support for small businesses, only 0.6 per cent in the core and 0.3 per cent in the periphery had used a loan from a government agency as their primary source of

start-up capital (GCRO QoL, 2015). Business owners in the periphery were much more likely to express dissatisfaction with government support for small business (44 per cent) than those in the core (37 per cent). There were no significant differences in the main constraints experienced by business owners,

however. But, although crime and theft were named as the major constraint by business owners regardless of where they lived, those living in the periphery (18 per cent) were slightly more likely than those in the core (15 per cent) to cite them as the main constraint to their business.

Table 22: Success and failure of businesses, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Core	Periphery
Too early to tell	13	17
Failed	45	46
Business is a success	28	25
Business was a success and I sold/stopped it	7	5
My business brings in some money but not enough so I have to do other things to bring in income	7	6

Table 23: Age of businesses, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Up to 1 year	2 years	3 - 4 years	5 - 6 years	7 - 10 years	11 - 15 years	16+ years
Core	15	13	17	18	18	10	10
Periphery	14	14	19	17	16	11	10

Table 24: Primary source of start-up capital, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Personal savings	Bank loan	Profit from other business	Usurers/mashonisa	Loan from relatives	Business credit	Loan from government agency	Other source
Core	77	9	2	0	4	1	1	5
Periphery	78	7	3	1	4	1	0	4

6.2 Income

As elsewhere, in Gauteng income reflects a person's type of employment and level of education (GCRO QoL, 2015). Data from both Census 2011 and the GCRO Quality of Life 2015 survey show that income is also still strongly related to race, with black African individual and household incomes remaining stable or increasing only slightly over time, and white incomes remaining disproportionately high and increasing at a higher rate. Households in peripheral areas are proportionately more likely to earn less than households in core areas, and less likely to fall into the higher income brackets (Census, 2011; GCRO QoL, 2015). In 2011, the annual incomes of 43

per cent of households in peripheral areas, and 32 per cent in core areas, were R38 200 or less (Table 25). A similar but more stark picture is found when individual incomes are considered (Table 26). Figure 25 shows the distribution of people earning between R0–1 600 per month and clearly demonstrates that these residents are most likely to be found in peripheral areas of Gauteng, and in the old black African townships on the edges of the core. The mining areas of the West Rand in the periphery are an exception, as higher proportions of the population are employed there.

Table 25: Annual household incomes, Gauteng, 2011 (%)

SOURCE: Census, 2011

	No income	R1 – R4 800	R4 801 – R9 600	R9 601 – R19 600	R19 601 – R38 200	R38 201 – R76 400	R76 401 – R153 800	R153 801 – R307 600	R307 601 – R614 400	R614 001 or more
Core	16	3	4	10	15	14	12	11	9	6
Periphery	17	4	6	14	19	15	9	7	5	3

Table 26: Monthly individual incomes, Gauteng, 2011 (%)

SOURCE: Census, 2011

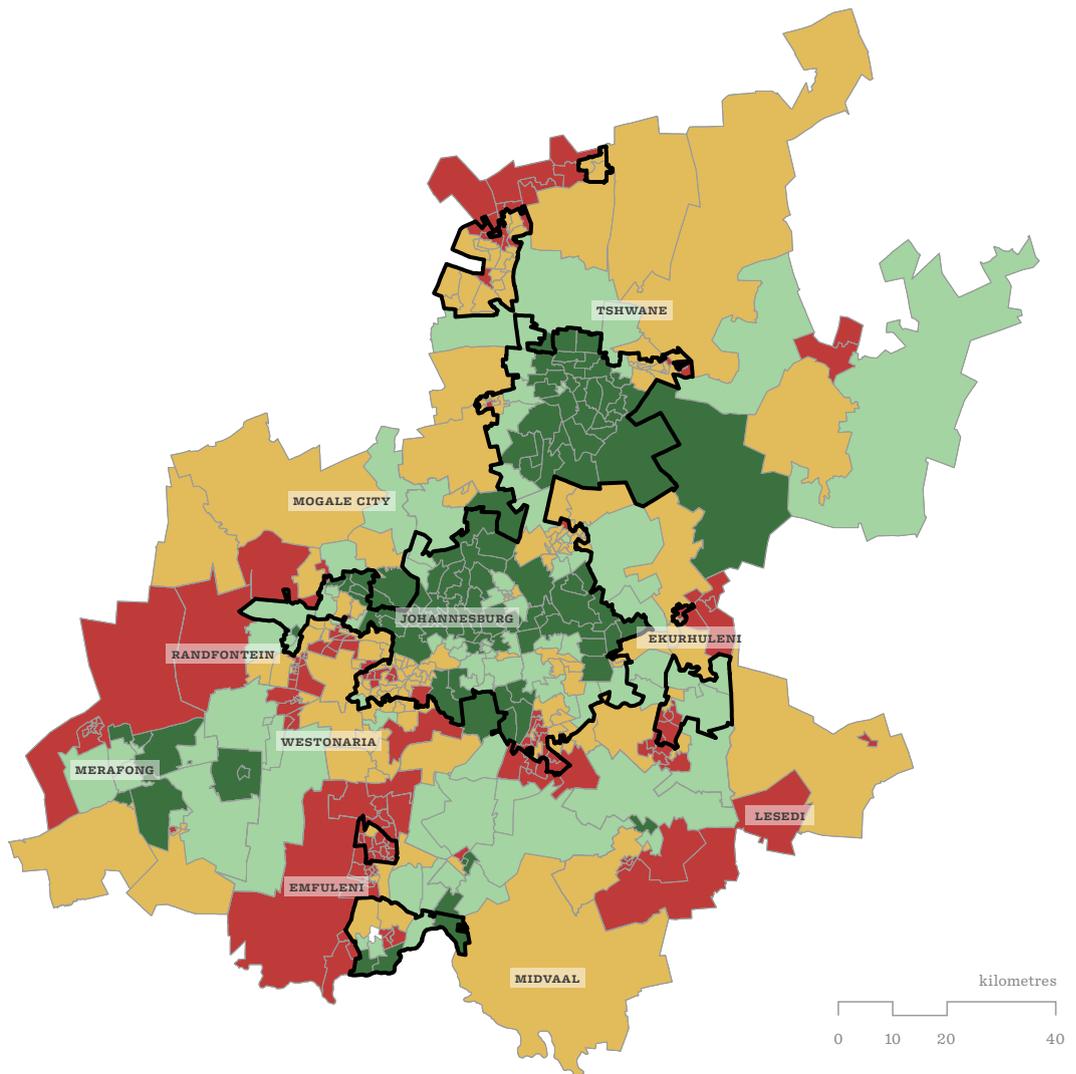
	No income	R1 – R400	R401 – R800	R801 – R1 600	R1 601 – R3 200	R3 201 – R6 400	R6 401 – R12 800	R12 801 – R25 600	R25 601 – R51 200	R51 201 – R102 400	R102 401 or more
Core	44	8	3	9	10	8	7	6	3	1	0.6
Periphery	48	13	3	10	9	6	5	3	2	1	0.3

Photograph by Holger Deppe

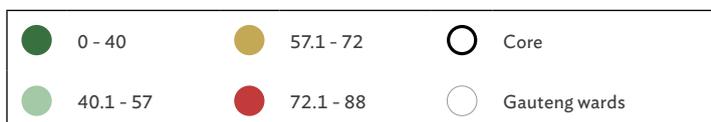


Figure 25: Percentage of population earning R0 - R1 600 per month per ward (%)

SOURCE: Census, 2011



Percentage of population earning R0 - R1 600 per month per ward (%)





Photograph by Lelani du Preez

Income from formal and informal employment is important in both core and peripheral areas (Table 27). In the GCRO Quality of Life 2015 survey, of those who were employed, a higher percentage of residents in the core than in the periphery were employed full or part time in the formal sector (69 per cent compared to 64 per cent in the periphery), while a higher percentage of residents in the periphery than in the core were employed in the informal sector (26 per cent compared to 21 per cent in the core). However, the informal sector was an important source of income for households in all areas, with 32 per cent of households in peripheral areas, and 30 per cent in core areas, deriving at least part of their household income from the informal

sector (Table 27). Households in the core were more likely to have assets like rental dwellings and savings and investments from which they derived income (Table 27). As a significant proportion of residents are migrants, it was not surprising that in the GCRO Quality of Life 2015 survey, 22 per cent of respondents in the core, and 20 per cent in peripheral areas, gave support or money to another household living elsewhere, and, 25 per cent of residents in the core, and 22 per cent in the periphery, received support or remittances from family elsewhere (Table 27). Government grants provided income to 45 per cent of households in peripheral areas and 37 per cent in core areas (Table 27).

Table 27: Source of household income, Gauteng, 2015 (%)⁴

SOURCE: GCRO QoL, 2015

	Formal employment	Informal employment	Government grants (including pensions)	Support from family/remittances	Support from friends	Renting dwelling/flat/garage etc.	Savings/returns from investment
Core	54	30	38	25	9	12	25
Periphery	46	32	45	22	8	8	16

NOTE: Multiple response question.

The proportion of respondents saying their household received income from the formal sector, is lower than the proportion of those who were employed who said they worked in the formal sector, because the former includes all respondents regardless of whether they were in employment or not.

Despite low incomes, and in some cases perhaps because of them, some residents in Gauteng are in debt. The GCRO Quality of Life 2015 survey found 42 per cent of residents in the core, and 36 per cent in the periphery, said they had debt owing. This is a significant increase since the GCRO Quality of Life 2013 survey, when 31 per cent of residents in the core and 28 per cent in the periphery had debt owing.

The 2013 survey found that residents in the core were more likely to owe debt on potential assets such as a property or a vehicle (Table 28).⁵ A substantial proportion of residents in the province carried debt, but those in the periphery, although slightly less likely to have debt, were more likely to owe money without gaining tangible assets in return.

Table 28: Type of debt, Gauteng, 2013 (%)

SOURCE: GCRO QoL, 2013

	Bond/ mortgage owing	Credit card owing	Vehicle finance owing	Personal bank loan owing	Other loan owing	Friend/ family/ stokvel owing	Owe but not paying back
Core	19	28	15	25	60	8	19
Periphery	13	23	13	25	65	10	24

NOTE: Multiple response question.

Table 29: Eating in Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Any time in past year adult in household gone hungry because there was not enough food	Any time in past year children in household gone hungry because there was not enough food	Any children in house- hold benefitting from a school feeding scheme	Grows fruit and vegetables for own consumption
Core	12	10	25	9
Periphery	15	14	37	15

5. No questions on kinds of debt owed were asked in the GCRO Quality of Life 2015 survey.

For some households, in both core and peripheral areas of Gauteng, low incomes translate into missed meals and hunger. Good nutrition is important to childhood development, and physical growth and strength for both adults and children. The GCRO Quality of Life 2015 survey found a higher percentage of households in peripheral areas reported that members of the household had gone hungry from lack of food than in core areas (Table 29). Similarly, a higher proportion of households in the periphery had children who benefitted from a school feeding scheme, suggesting lower incomes. Relatively few households in either area grew fruit and vegetables for their own consumption, and virtually none grew produce to sell to others. However, the proportion of those growing food for their own households had grown between 2013 and 2015.

In the GCRO Quality of Life 2015 survey, residents in the core were more likely (35 per cent) than those in the periphery (26 per cent) to be

satisfied with the amount of money they had available. Conversely, residents in the periphery (63 per cent) were more likely to be dissatisfied or very dissatisfied than those in the core (50 per cent) (Table 30). The proportions of those who were dissatisfied with the amount of money available to them had declined since the GCRO Quality of Life 2013 survey, when this applied to 67 per cent of residents in the periphery, and 57 per cent in the core. Similarly, the proportion of residents in both core and periphery who were dissatisfied with their standard of living declined between 2013 and 2015 (Table 30). In 2013, a quarter of residents in the core and a third in the periphery were dissatisfied. More dramatically, the proportions who were very satisfied with their standard of living rose significantly in 2015 from 7 per cent in both core and periphery in 2013 (Table 30). A third of residents in the periphery were dissatisfied with their standard of living compared to a quarter in the core (25 per cent) (Table 30).

Table 30: Satisfaction with amount of money and standard of living, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

Satisfaction with amount of money available to respondent					
	Very satisfied	Satisfied	Neither	Dissatisfied	Very dissatisfied
Core	7	28	15	33	17
Periphery	4	22	12	41	22
Satisfaction with standard of living					
Core	20	47	13	15	5
Periphery	15	46	13	19	7

Overall, the employment and income data, when taken together, indicate that people living in peripheral areas are at a disadvantage. As the differences are not always dramatic, the data suggests that there is a blurring of lines between the labour pool of core and peripheral areas in the province. These lines are made more complex by the legacies of apartheid settlement patterns which mean that many people who live in the periphery work in core areas. Thus, on an intra-provincial scale, the data reinforces the idea that peripheral areas act as a labour pool for the core. The legacy of apartheid is also evident in on-going income and employment inequality in the province, and is therefore reflected in the income and employment data.

6.3 Changes in employment and income

According to Census data, there do not seem to have been significant changes in employment between 1996 and 2011. It is difficult to compare income levels as the buying power of the rand has changed with inflation over the past twenty years, as have the race profiles of the population which are reflected in income levels. Levels of employment and unemployment were not significantly different in the core and periphery in 1996 and 2011. It is not clear what caused the significant growth in unemployment in both areas, recorded in the 2001 Census (Table 31). What is notable is that both core and peripheral areas have maintained levels of employment (at least in 1996 and 2011) in the face of a rapidly increasing population through natural growth and migration.

Table 31: Employment and unemployment, Gauteng, 1996, 2001 and 2011 (%)

SOURCE: Census, 1996, 2001, 2011 (Quantec)

		Employed	Unemployed	Discouraged work-seeker
1996	Core	70	27	3
	Periphery	67	29	4
2001	Core	61	33	6
	Periphery	53	38	9
2011	Core	73	23	4
	Periphery	66	28	6

Table 32: Employment by sector, Gauteng, 1996, 2001 and 2015 (%)

SOURCE: Census, 1996, 2001 (Quantec); GCRO QoL, 2015

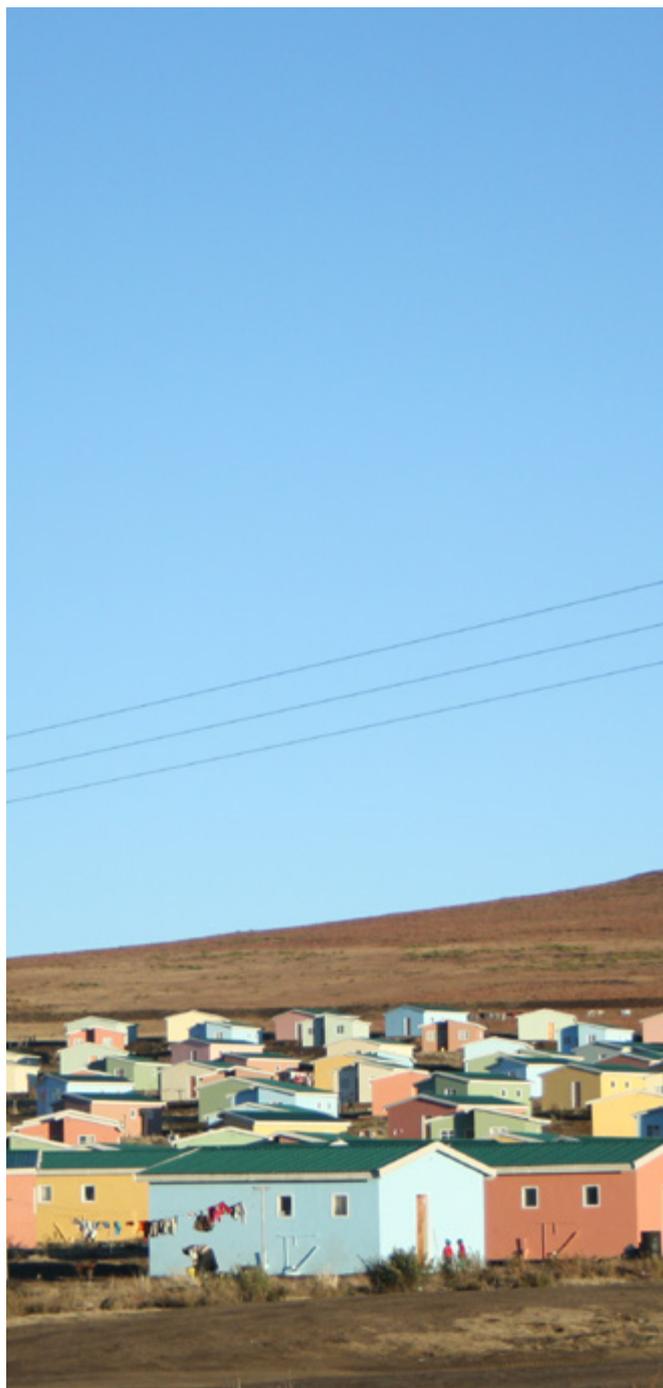
	1996		2001		2015	
	Core	Periphery	Core	Periphery	Core	Periphery
Agriculture, hunting, forestry and fishing	1	4	1	5	2	3
Mining and quarrying	1	19	1	10	3	7
Manufacturing	14	12	14	14	10	10
Electricity, gas and water supply	1	1	1	1	4	4
Construction	6	7	5	7	9	10
Wholesale and retail trade	15	12	17	16	14	13
Transport, storage and communication	7	6	6	5	7	6
Financial, insurance, real estate and business services	14	7	16	9	11	5
Community, social and personal services	17	11	29	23	6	6
Private households	12	12	n/a	n/a	11	11
Public sector/government	n/a	n/a	n/a	n/a	11	10
Other	12	9	9	11	13	14

Although there appear to have been some changes in the categories in which people are employed, levels of unemployment, income disparities and inequalities appear to have remained relatively constant between core and peripheral areas as well as in the province as a whole between 1996 and 2011. These consistencies have been maintained within the context of a rapidly increasing population and in times of economic turmoil. But the ongoing high levels of unemployment and low incomes are of concern. This data also raises questions about the racialised nature of inequality in the province. Furthermore, it suggests that since Gauteng is a core area, capital does not need to look beyond the borders of the province for a cheap labour force because it has one on its doorstep, and even, in places, within it. This labour force is made up, in part, of people from beyond the borders of the province, and from outside the country, who have moved into the province.

7. Housing

7.1 Uneven patterns in housing

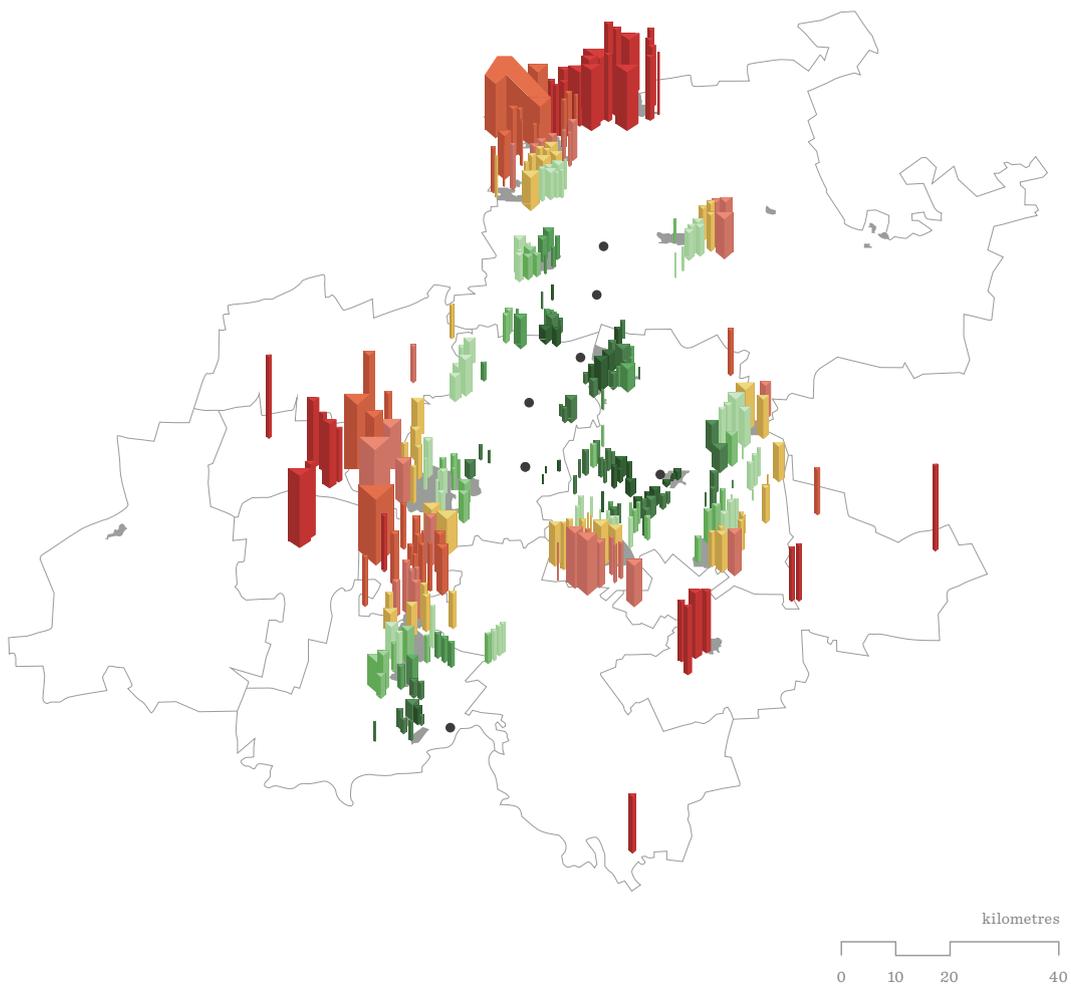
Housing, and the services people receive, are indicators of socio-economic disadvantage, marginality and peripherality. In South Africa, the situation is complicated by the spatial and housing legacies of apartheid, which have led to households living in poor dwellings and informal settlements in areas that lie in the core of the province, as well as outside in peripheral areas. At the same time, post-apartheid attempts to tackle and redress housing shortages have mostly been in the form of low-cost government housing developments, usually referred to as RDP housing. These developments mostly occur in peripheral areas and on the edges of cities of the GCR, where land is cheap. They are often some distance from economic centres where employment opportunities are most likely to be found (Figure 26). These developments have enabled many residents in the province to own their own home, either by being 'given' a house, or making a contribution to the cost, which is supplemented by government. Thus, outright home ownership has grown significantly in the province since 1994, particularly among black African residents.



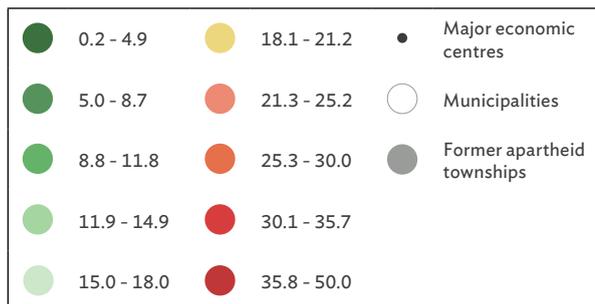
Photograph by Amanda van der Walt

Figure 26: Public housing programmes and distance to major economic centres, 2008

SOURCE: GCRO Map of the Month, February 2014 (www.gcro.ac.za)



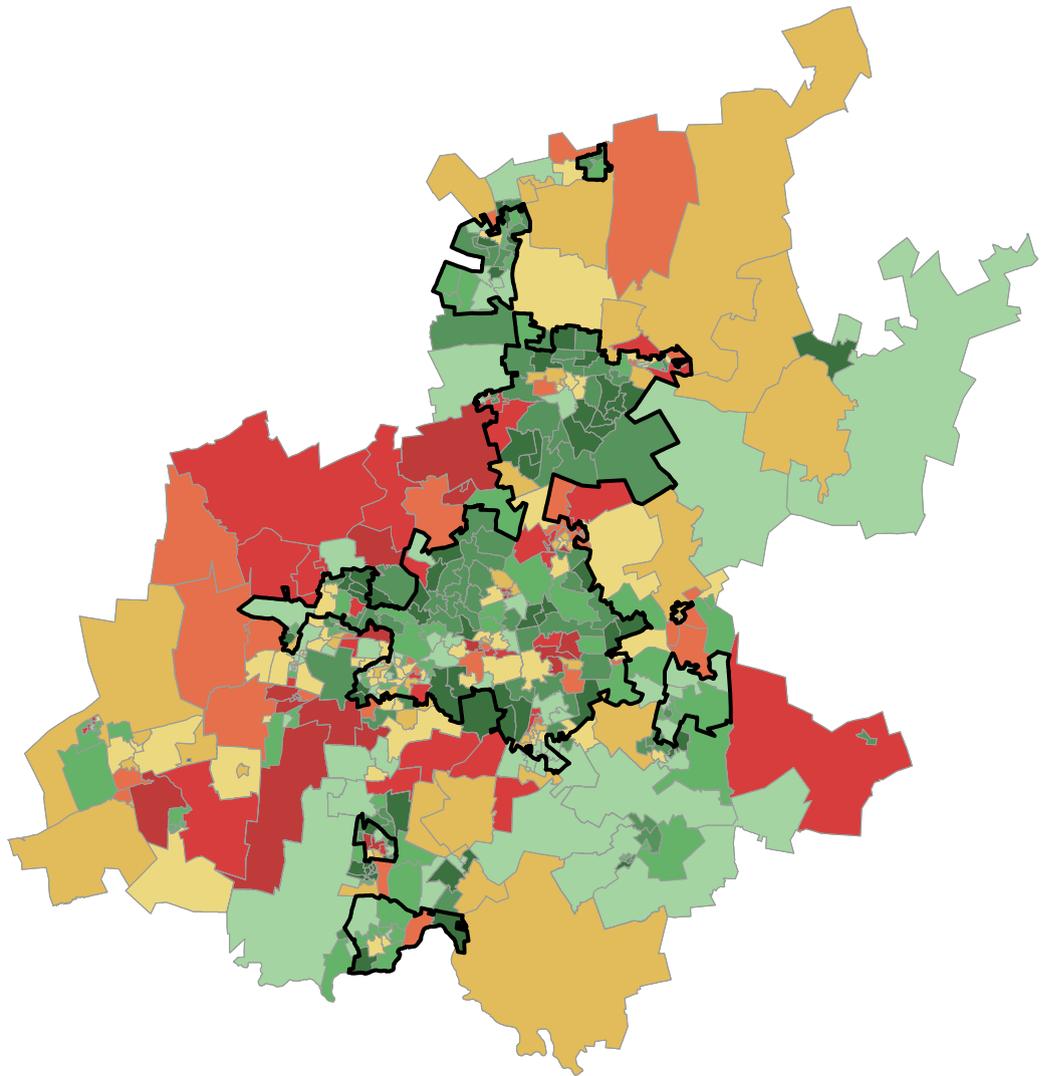
Public housing programmes (2008) and distance (km) to major economic centres



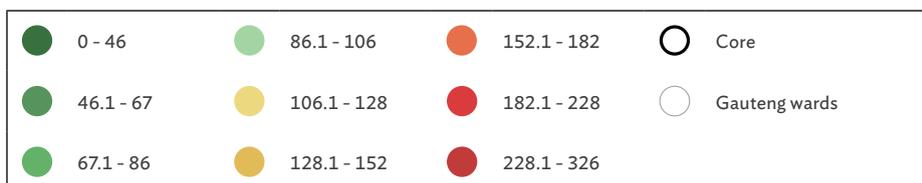
Major economic centres	Mean distance (km) from public housing to the nearest economic centre
Boksburg	14.6
Centurion	13.7
Johannesburg	20.3
Midrand	7.8
Pretoria	25.7
Sandton	17.3
Vereeniging	17.3
Gauteng	17.8

Figure 27: Housing index

SOURCE: Census, 2011



Housing index



A housing index was created, using Census 2011 data, by adding together the proportions of households living in non-formal⁶ housing (informal dwellings, caravans, tents), in 1 to 2 rooms, and in rented accommodation (Figure 23). Rented accommodation was chosen as a signifier of peripherality because, although living in rented accommodation does not necessarily mean that a household is vulnerable, households that live in rented accommodation lack security of tenure. A single person household living in 1 or 2 rooms may not have marginal housing conditions, or certainly not as marginal as a larger household in the same amount of space. According to this index, a higher proportion of households in peripheral areas are vulnerable in terms of housing or live in peripheral areas in peripheral housing (Figure 27). However, pockets of housing peripherality can be found in core areas, in particular in Alexandra, Midrand and parts of Ekurhuleni. Some areas of high peripherality, in terms of housing, are found within but on the edges of core areas (for example, Soweto, Mamelodi

and Tembisa). The swathes of red across the map in Westonaria, Mogale, Merafong and Lesedi, which lie in peripheral areas of the province, are notable. These areas may rank high on the index because of the mining industry so they are likely to have higher rates of small dwellings and rented accommodation. Informal settlements have also developed around the mines.

A lower proportion of households in the periphery live in enumerator areas with formal residential housing and are more likely to live in informal residential areas (Table 33). Not surprisingly, people in the periphery are more likely to live on farms, smallholdings and in areas with traditional housing. Collective living quarters (primarily hostels and compounds) provide a small amount of accommodation to residents in Gauteng. Collective living quarters in peripheral areas are likely a reflection of the mining economy. Hostels in the core were built by the apartheid state to accommodate South African migrant workers.

Table 33: Enumeration area type by person, Gauteng, 2011 (%)

SOURCE: Census, 2011

	Formal residential	Informal residential	Traditional residential	Collective living quarters	Industrial	Small holdings	Farms	Commercial	Other
Core	87	8	0.2	2	0.5	0.5	0.0	2	0.3
Periphery	74	14	3	2	0.3	5	2	0.3	0.4

Although households in peripheral areas are as, or slightly more, likely to live in brick houses on separate stands (59 per cent) than those in core areas (58 per cent), overall they are less likely to live in formal dwellings (71 per cent, compared to 85 per cent in the core) (Table 34). Importantly, they are much more likely

to live in an informal dwelling, whether in a backyard or an informal settlement. Over a quarter (29 per cent) of households did so in 2011 in the periphery, compared to 14 per cent of households in the core (Figure 29 and Table 34). Although seven per cent of households in the core lived in informal

6. Non-formal refers to all kinds of non-formal housing – tents, caravans etc while informal housing does not include these forms of non-formal housing.

dwelling in backyards in 2011, the highest proportions of those living in backyard dwellings lived in the periphery (Figure 28 and Table 34). Those who did so in the core were concentrated in historically-black townships. The GCRO Quality of Life 2015 survey indicated some improvements, as it found that 90 per

cent of households in the core lived in formal housing, compared to 79 per cent in the periphery. However, this means that nearly one in five households in the periphery still lived in informal dwellings, compared to one in ten in the core.

Table 34: Dwelling type of households, Gauteng, 2011 (%)

SOURCE: Census, 2011

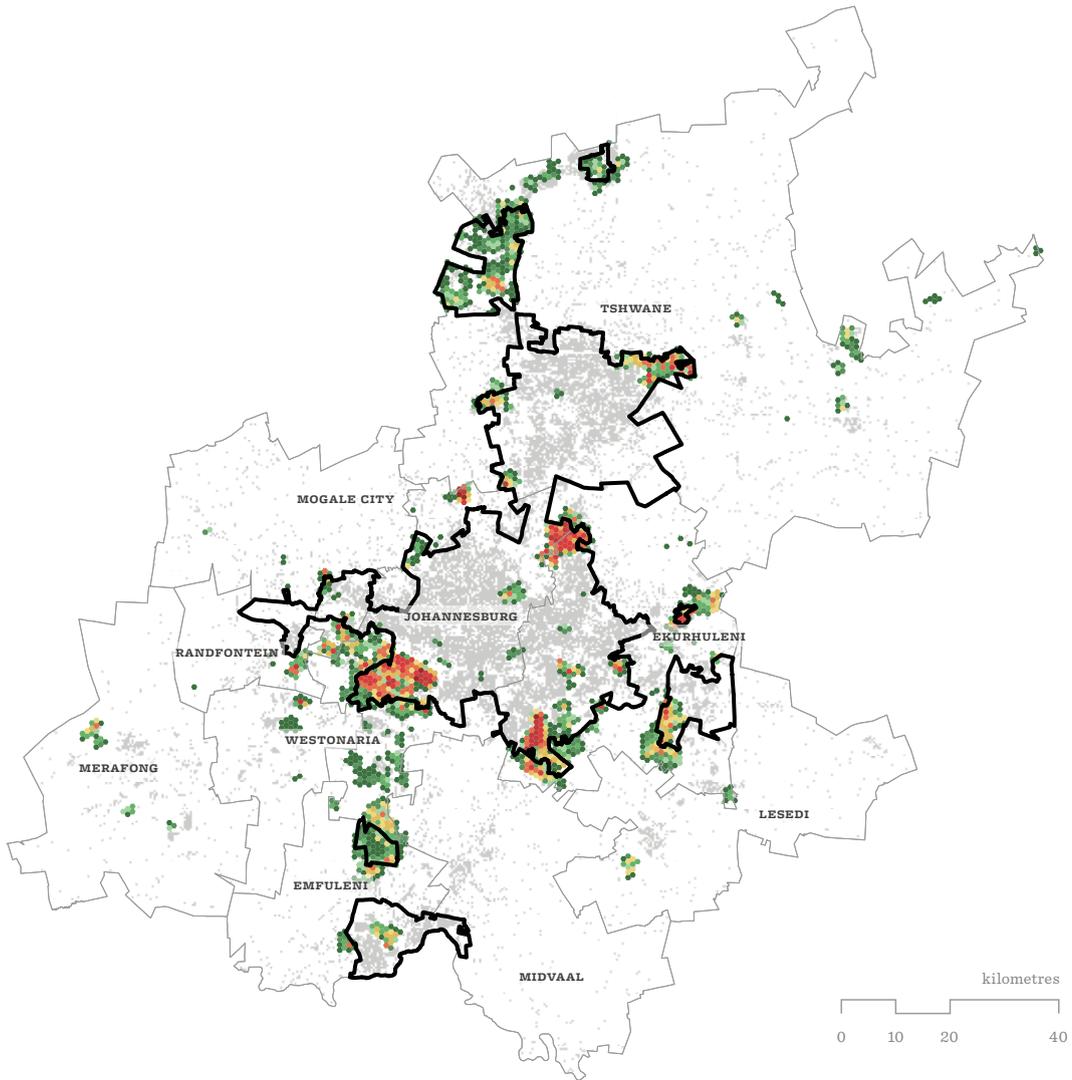
	House / brick concrete block structure on a separate stand or yard or farm	Cluster house, townhouse, semi-detached house, house in a complex	Semi-detached house	Flat or apartment in a block of flats	House, flat room in backyard	Informal dwelling in backyard	Informal dwelling not in backyard e.g. in an informal settlement or on farm	Other
Core	58	7	1	10	7	7	7	3
Periphery	59	3	1	3	4	10	19	2

Photograph by Amanda van der Walt



Figure 28: Backyard structures in Gauteng, 2010

SOURCE: GeoTerraImage landuse per building (2010); GeoTerraImage 10m landcover (2009)



Number of backyard structures per grid cell

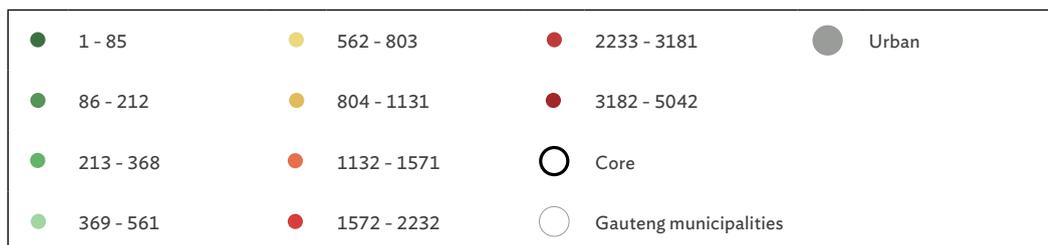
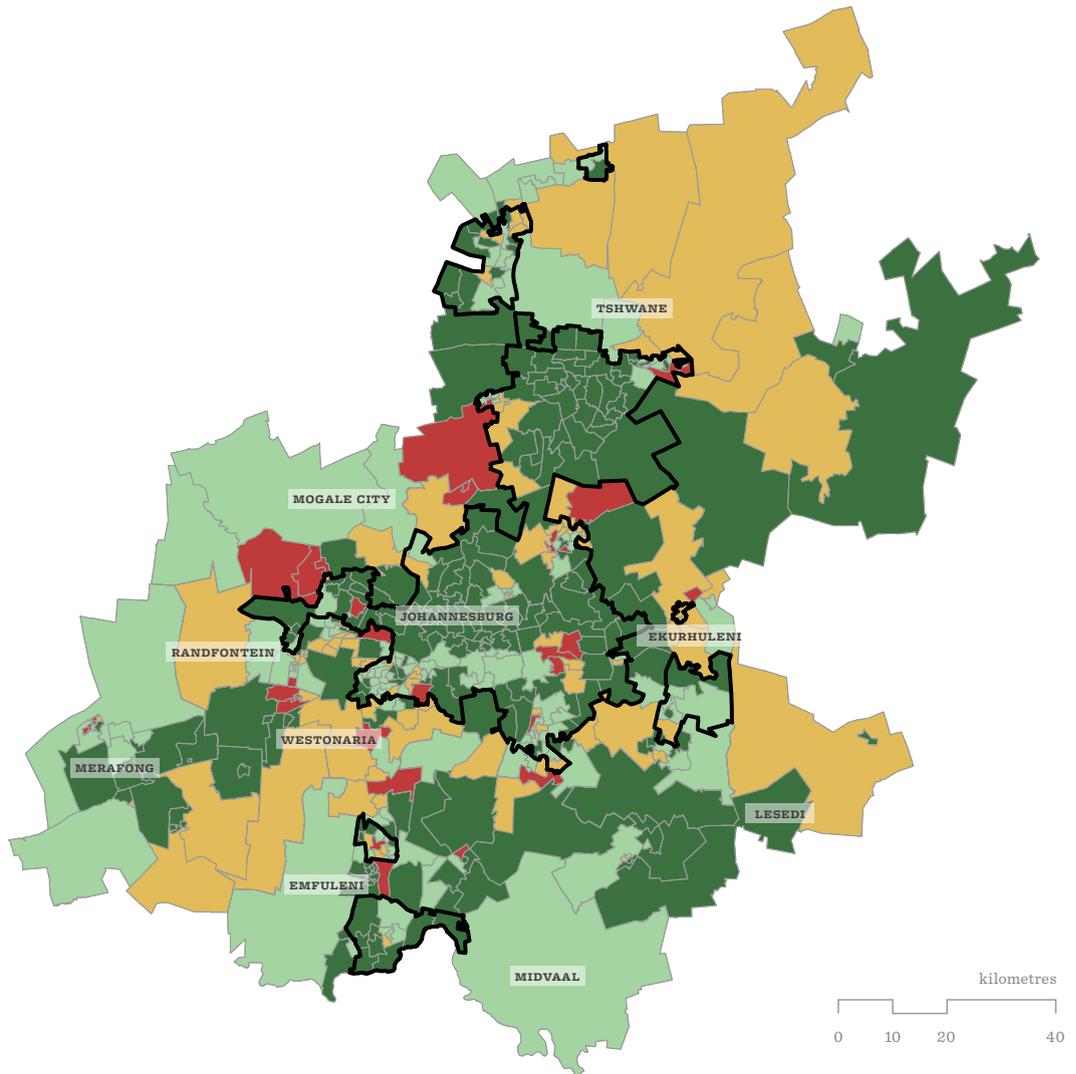


Figure 29: Households living in non-formal housing per ward (%)

SOURCE: Census, 2011



Households living in non-formal housing per ward (%)

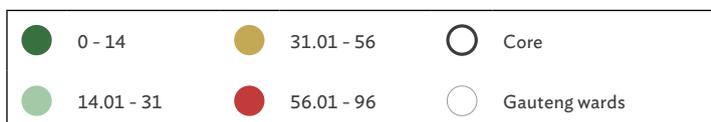
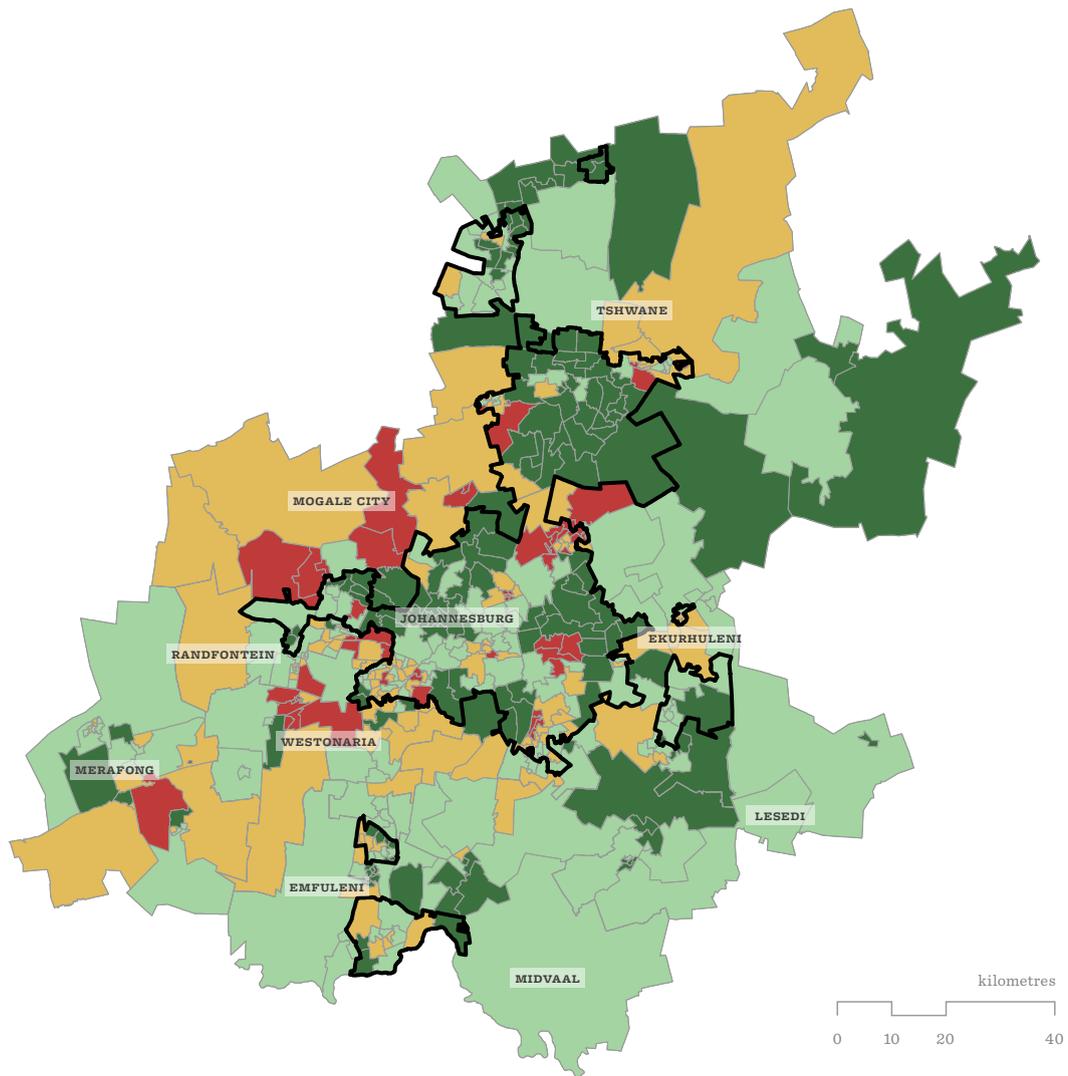
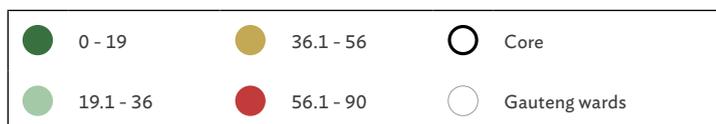


Figure 30: Households living in 1 - 2 rooms per ward (%)

SOURCE: Census, 2011



Households living in 1 - 2 rooms per ward (%)



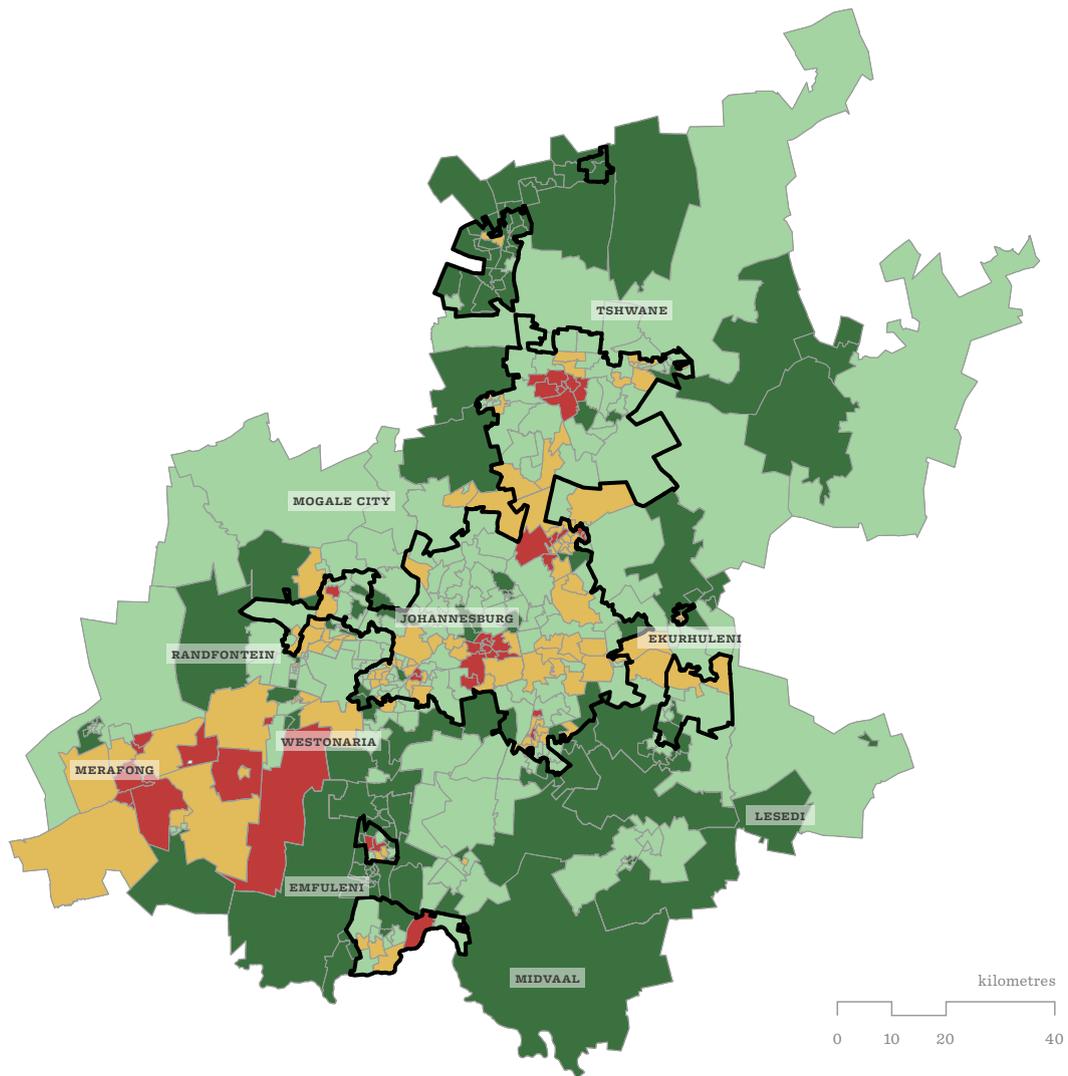
Living in formal dwellings does not necessarily guarantee good living conditions since overcrowding can occur. In 2011, over a third of households in peripheral (36 per cent) and core (34 per cent) areas lived in one or two rooms, with as many as a fifth in both areas living in only one room (Figure 30).

Photograph by Amanda van der Walt

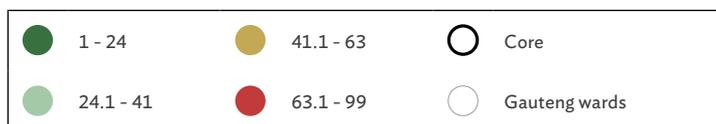


Figure 31: Households living in rented housing per ward (%)

SOURCE: Census, 2011



Households living in rented housing per ward (%)



People living in core areas are more likely to rent their dwelling and are less likely to own their own home or to occupy property rent free (Table 35 and Figure 31). Although households in core areas might then appear to be more marginal, paying for housing, and in a vulnerable situation as regards security of tenure, it may not be so. Housing occupied rent free may be provided by employers, or be informal housing. Both may be unstable in terms of security. Property that is owned and fully paid off includes government housing, which may not have the same asset value as privately

built and marketed housing. Higher proportions of households in the core own property on which they are still paying a mortgage bond, but they may be acquiring property of greater asset value than people who do not have a bond and live in RDP housing. Perhaps because of this, and the higher rates of living in informal dwellings, a larger proportion of households in peripheral areas (54 per cent) is not concerned about paying for housing each month than households in core areas (38 per cent) (Table 35).

Table 35: Household tenure type, Gauteng, 2011 (%)

SOURCE: Census, 2011

	Rented	Owned but not yet paid off	Owned and fully paid off	Occupied rent free	Other
Core	41	18	26	12	2
Periphery	29	14	31	23	3

The GCRO Quality of Life 2015 survey provided more detailed information about the tenure status of residents in the core and peripheral areas of Gauteng (Table 36). There are some differences between what was found in the 2011 Census and the GCRO Quality of Life 2015 survey relating to the proportion of people who said they lived in rented accommodation and who occupied accommodation rent free, and the proportions of people who said their property was owned and fully paid off. Notwithstanding this, the data gathered by the GCRO Quality of Life 2015 survey showed that a higher proportion of households in peripheral areas lived in RDP housing (24 per

cent, compared to 10 per cent in the core) (Table 36). This reflects where RDP housing has been built (Figure 29). Although people in peripheral areas have benefited from RDP housing, they are still more likely to live in informal housing than people in core areas. The higher proportion of people living in informal housing in peripheral areas may be reflected in levels of satisfaction with their housing. The GCRO Quality of Life 2015 survey found that 16 per cent of residents in the core were dissatisfied with their dwelling, compared to a quarter (25 per cent) in the periphery.

Table 36: Tenure status of households, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Core	Periphery
Owned, but paying off a bond	16	13
Owned, and fully paid off	31	25
Free RDP house	10	24
Transfer of title deed of existing government house	5	3
Private rental	23	14
Renting from government (municipal/council rental)	5	3
Rent free	6	10
Occupation of vacant dwelling	2	5
Other	2	3

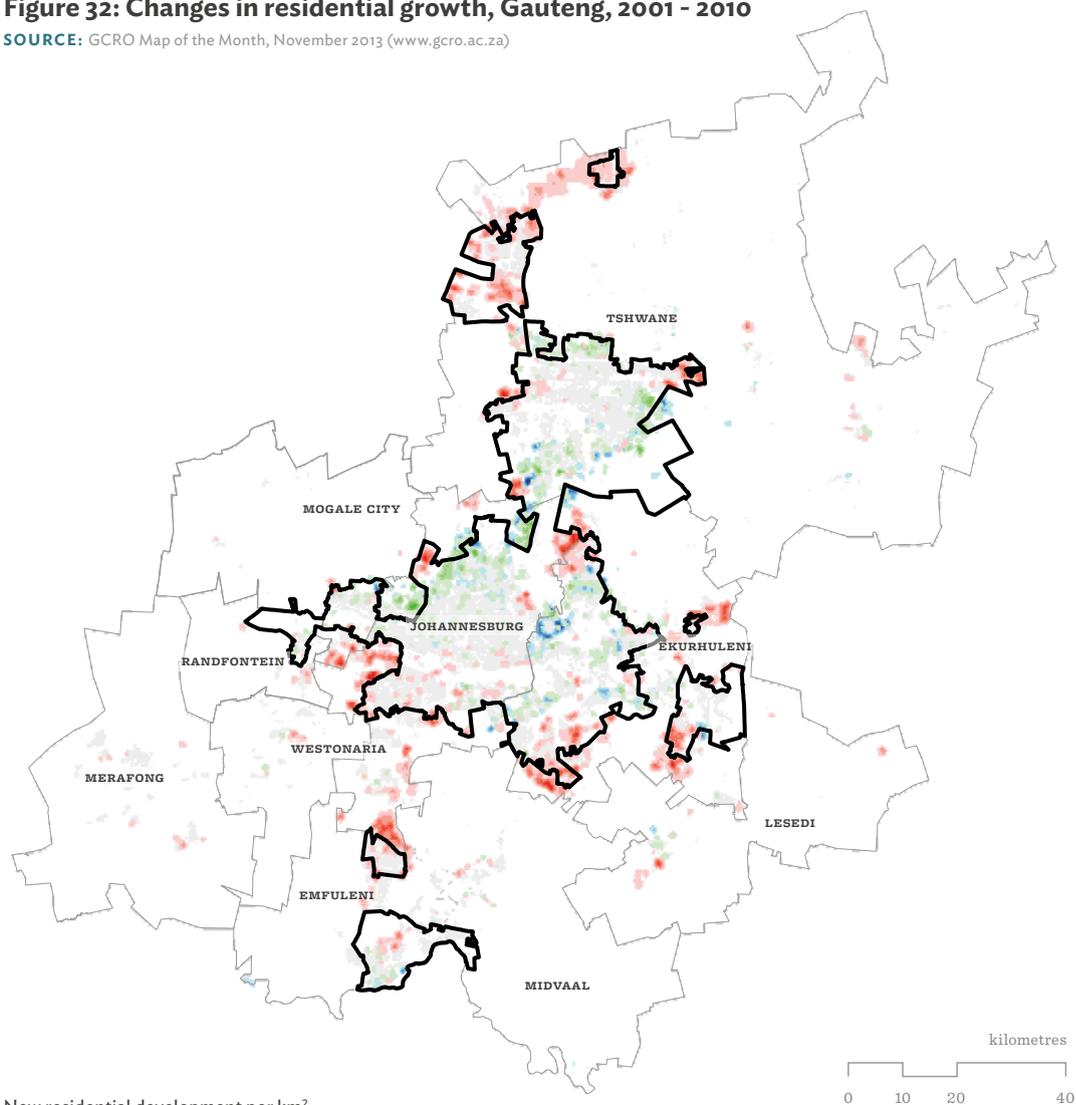
Overall, the data shows that, notwithstanding the presence of RDP housing, households in peripheral areas are disadvantaged in that they are significantly more likely to live in informal dwellings. The location of RDP housing in the periphery and in peripheral areas on the edges of the core, where some eligible residents already lived, indicates a perpetuation of peripherality in terms of housing for many residents. This is because places of potential employment are some distance away, and the houses themselves, although welcome, do not have significant asset value beyond having four brick walls and a roof. Nevertheless, and importantly, they are a place to call home.

7.2 Changes in housing

Not surprisingly, given the increase in population in both the core and the periphery, there has been an expansion of urban areas since 1994, as well as of residential developments (Figure 32). There are areas which show growth, mostly on the edges of the core, with some reflecting the development of new government housing, but there was little evidence of dramatic urban sprawl from the core into the periphery between 2001 and 2010. There is little evidence of the 'swallowing' of peripheral towns and villages into the core, except perhaps in Midrand.

Figure 32: Changes in residential growth, Gauteng, 2001 - 2010

SOURCE: GCRO Map of the Month, November 2013 (www.gcro.ac.za)



New residential development per km²

Formal houses	Townhouse units	Estate/security units	
● 56 - 523	● 53 - 431	● 50 - 201	 Core
● 524 - 990	● 432 - 809	● 202 - 352	 Gauteng municipalities
● 991 - 1 457	● 810 - 1 187	● 353 - 503	 CSIR National 2000 land cover (urban)
● 1 458 - 1 925	● 1 188 - 1 565	● 504 - 654	
● 1 926 - 2 392	● 1 566 - 1 942	● 655 - 805	

Table 37: Dwelling type (households), Gauteng, 1996, 2001 and 2011 (%)

SOURCE: Census, 1996, 2001, 2011 (Quantec)

	House or brick structure on separate stand	Flat in block of flats	Town/cluster/semi-detached house	Room/flatlet on shared property	House/flat/room in backyard	Informal dwelling/shack in backyard	Informal dwelling/shack elsewhere	Other
1996								
Core	50	10	6	2	12	8	11	2
Periphery	50	2	2	2	6	7	29	2
2001								
Core	52	8	6	2	8	7	12	6
Periphery	49	2	1	1	4	6	25	12
2011								
Core	58	10	9	1	7	7	8	2
Periphery	59	3	4	1	4	10	19	1

Despite the rapidly increasing population, the proportion of households living in informal housing across the province declined. However, in the core, while the proportion of households living in backyard houses, flats and rooms fell by half between 1996 and 2011, the proportion living in informal dwellings in backyards has remained nearly the same (Table 37). In the periphery, the proportion of households living in informal dwellings in backyards increased between 2001 and 2011. This could be a reflection, in part, of the growth in RDP housing and the creation of new opportunities for backyard informal dwellings, as households supplement their incomes. Although the proportion of households living in informal dwellings in backyards has remained stable in the core, and grown in the periphery, there has been a decline in the proportion of households living in informal dwellings in informal settlements, across the province (Table 37). This is particularly

noticeable in the periphery where the proportion of households living in informal dwellings not in backyards, fell from 29 per cent in 1996, to 18 per cent in 2011 (Table 37).

However, in 2011, 29 per cent of households in the periphery, and 15 per cent in the core, still lived in informal dwellings (Table 37). Indicating the challenges of providing housing in the face of rapid population growth, although the proportion of households living in informal dwellings has fallen, the number of households doing so has risen. In 1996, almost 210 000 households in the periphery, and 280 000 in the core, lived in informal dwellings. By 2011, these numbers had risen to over 350 000 in the periphery, and almost 390 000 in the core. The greater rate of increase in the number of households in the periphery living in informal dwellings suggests the marginalisation of peripheral areas.

Changes in housing between 1996 and 2011 indicate that government is having some success in evening out some of the most glaring inequities in housing options between core and peripheral areas. However, the location of much of the new government housing is problematic since residents remain relatively spatially isolated from opportunities being created in the core (Figure 34). Similarly, mega human settlements proposed by the provincial government and the private sector are largely planned for outside the core, or on its edges (Figure 35). The development of security estates, townhouse and cluster developments for wealthy residents (and their visitors) only, is creating new exclusionary spaces in both core and peripheral areas where only they (and their visitors) can enter. Although this is particularly noticeable

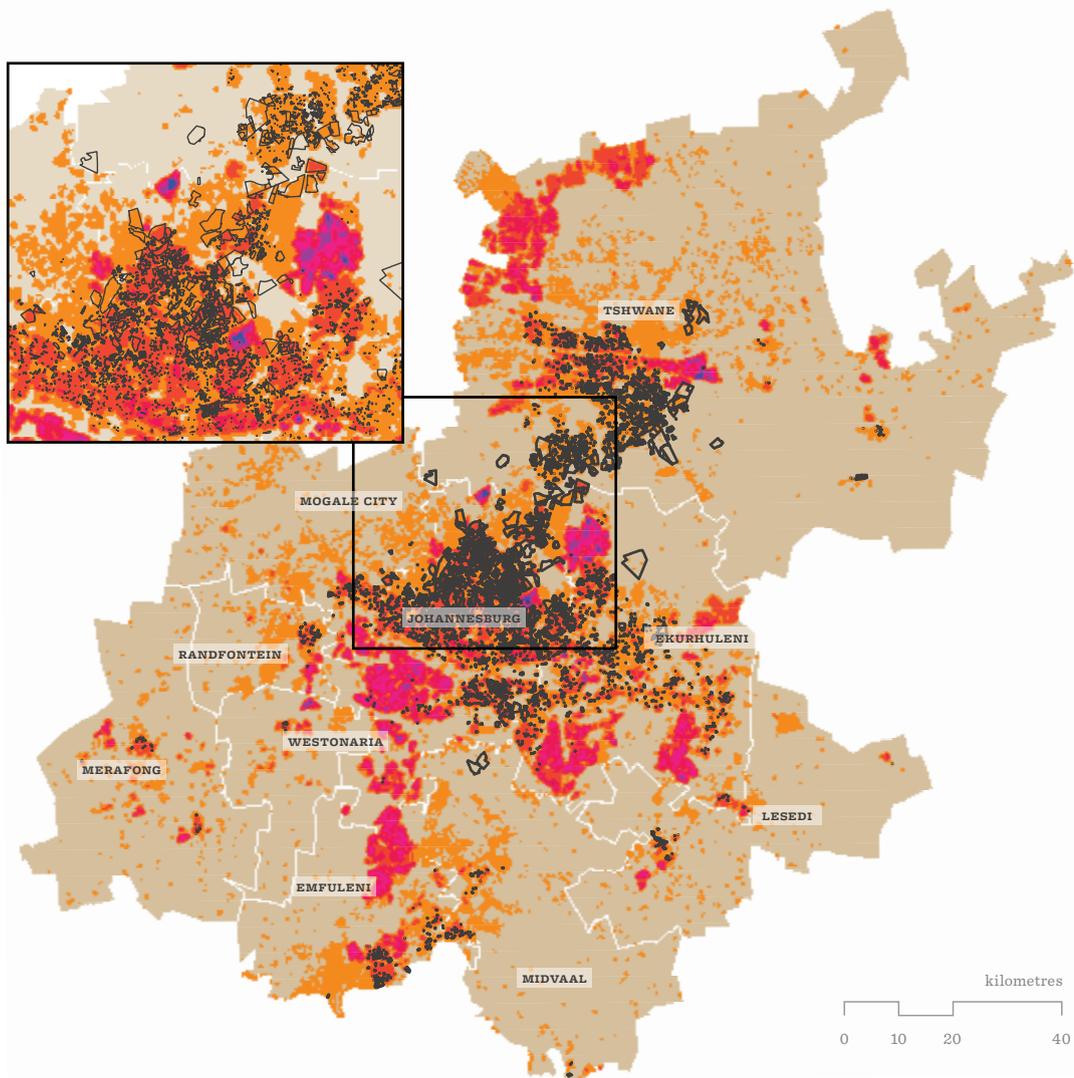
in core areas (Figure 33), as Phil Harrison and Yasmeen Dinath show in the next part of this report, cluster homes and security estates for high-income households are also being developed in peripheral areas, particularly around Hartbeespoort Dam (Long and Hoogendoorn, 2012). These developments are creating exclusionary spaces only available to the wealthy, while poor, usually black, residents, often dependent on the state to provide affordable housing rather than informal dwellings, are relegated to the margins. The growth of privately-owned spaces in the core, and the continued spatial marginalisation of residents in peripheral areas, even if in RDP housing, raises questions about connectivity, relationships between core and peripheral areas, and the right to the city (Harvey, 2008).

Photograph by Gareth Pon



Figure 33: Fragmenting space: The development of privately-governed space in Gauteng

SOURCE: GCRO Map of the Month, September 2012 (www.gcro.ac.za)



Density of buildings (derived from Eskom SBC 2010)

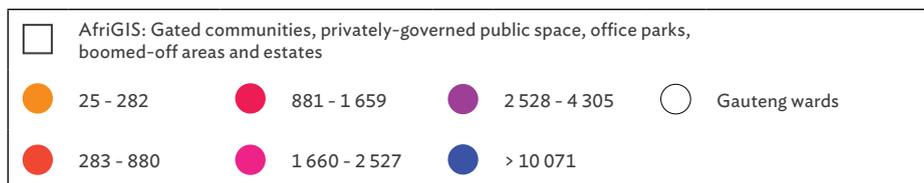
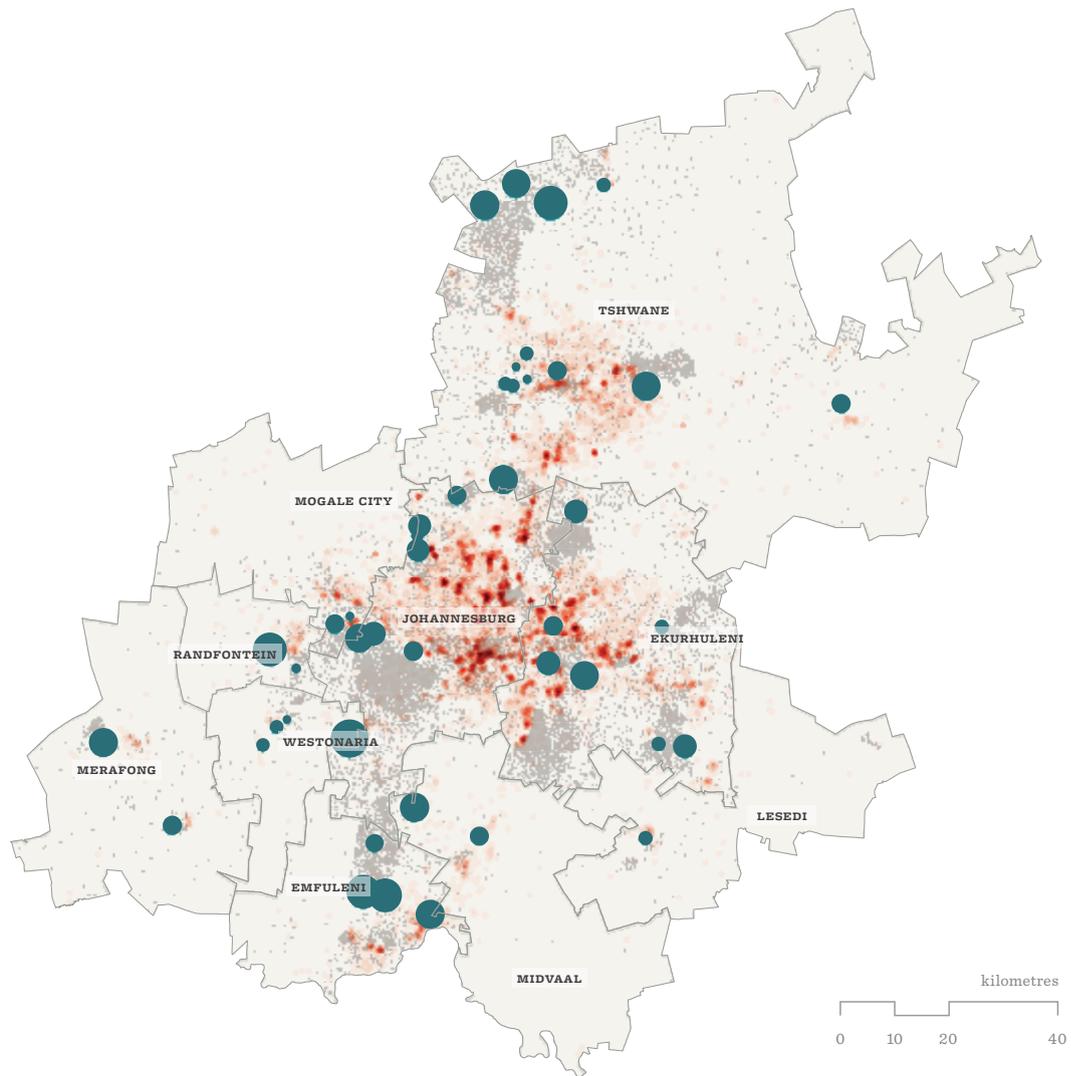


Figure 34: Planned housing developments and proximity to businesses

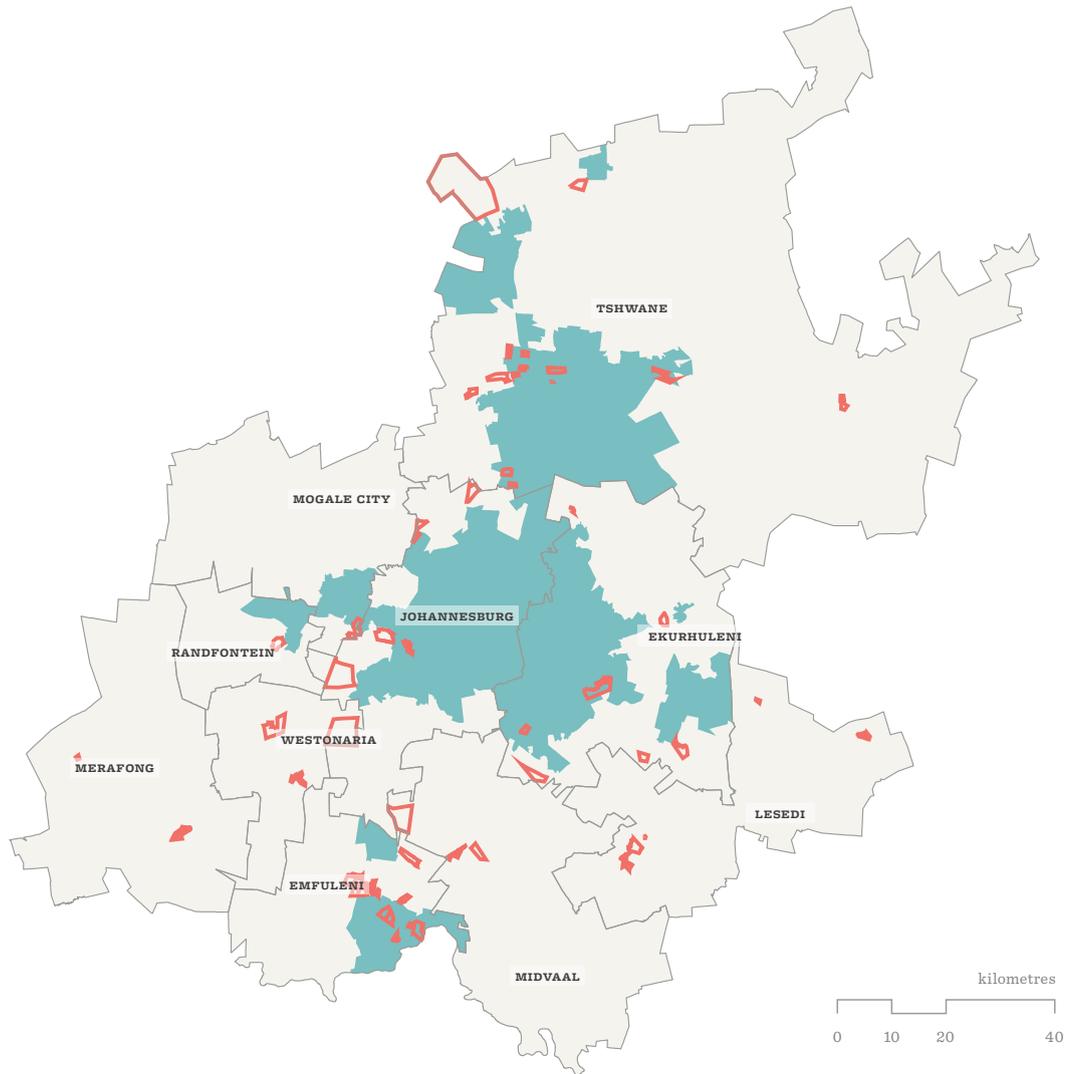
SOURCE: GCRO Map of the Month, May 2015 (www.gcro.ac.za)



Planned housing developments (housing units)		Number of businesses per sq kilometre	
● 1000 - 3500	● 15001 - 22366	● 1 - 5	● 48 - 64
● 3501 - 7472	● 22367 - 37000	● 6 - 12	● 65 - 82
● 7473 - 11000	● 37001 - 60000	● 13 - 23	● 83 - 103
● 11001 - 15000		● 24 - 35	● 104 - 130
Unemployment dot density	● 1 Dot = 100 unemployed	● 36 - 47	● 131 - 198

Figure 35: Proposed and developing mega housing projects, 2015

SOURCE: Gauteng Department of Human Settlements, 2015



8. Access to services

8.1 Water, energy and sanitation

The focus of much of the literature on uneven development is on the core and peripheral areas of Europe and North America, whether viewed at a global or a local scale. In studies of these regions, little attention is paid to access to services because most households are provided with electricity, piped water into dwellings, sanitation and refuse removal services. However, in Gauteng, the provision of infrastructure and services, and access, or lack thereof, is a measure of peripherality. Access to services, including water, energy, sanitation and refuse removal, is related to the kind of housing people live in, the infrastructure and services provided by parastatals, metros, municipalities and provincial government, and how affordable those are.

Having services provided is one thing, being able to pay for them, is quite another. Households

across the province were found to have municipal service arrears (Table 38). However, households in peripheral areas were less likely to be in arrears or to have had their electricity or water cut off for non-payment (Table 38). The proportions of households reporting municipal services arrears, services cut-offs and evictions, all increased between 2013 and 2015, suggesting increasingly hard times for both households and municipalities (Table 38). The smaller increase in services cut-offs than in municipal services arrears may reflect the increasing roll-out of pre-paid electricity and water meters in the province.⁷ Higher rates of arrears and cut-offs in the core may indicate slower roll-out of pre-paid meters in these areas. It could also be because a higher proportion of residents in the core receive services that can be cut off.

Table 38: Arrears, services cut-offs and evictions for non-payment, Gauteng, 2013 and 2015 (%)

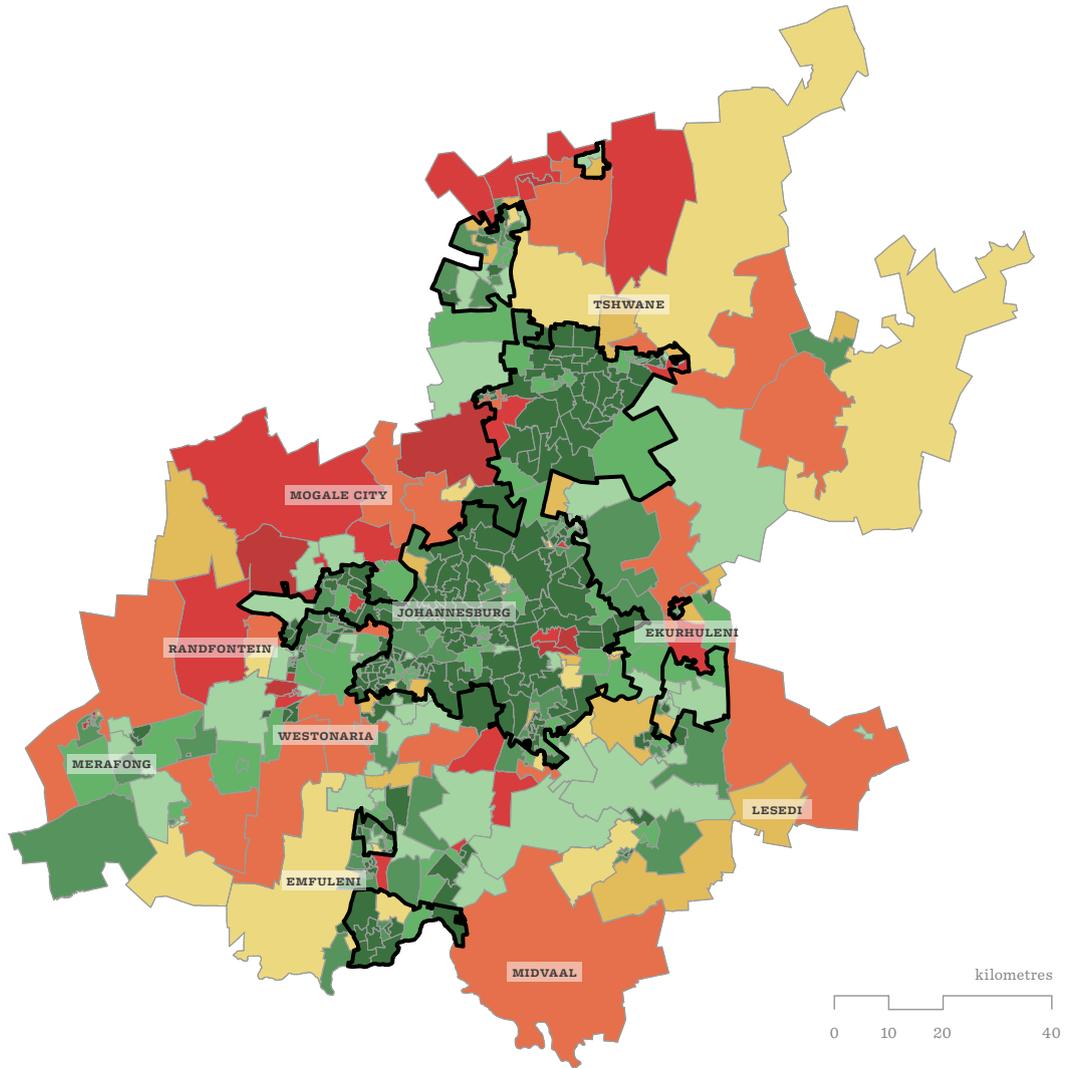
SOURCE: GCRO QoL, 2013 and 2015

	Municipal service arrears	Water cut off for non-payment	Electricity cut off for non-payment	Evicted for non-payment
2013				
Core	12	4	7	1
Periphery	12	3	4	0
2015				
Core	24	7	10	2
Periphery	21	5	8	2

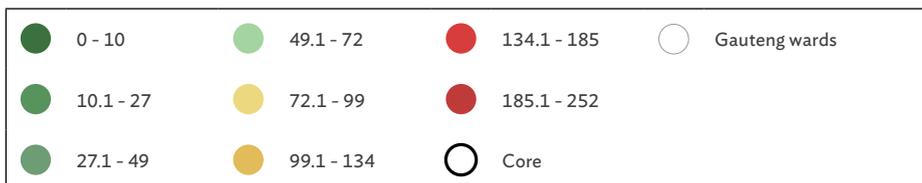
7. People who pay for electricity or water on account are in arrears if they don't pay their account, and may then be cut off from the particular services. With pre-paid services, the service stops when the money on the pre-paid card runs out. Arrears and cut-offs do not therefore apply to pre-paid services.

Figure 36: Services index

SOURCE: Census, 2011



Services index



A services index was created using Census 2011 data on the proportion of households, per ward, with access to water more than 200 m from their property, using fuel other than electricity or gas for cooking, and with no access to flush toilets. National government minimum standards aim to provide residents with piped water within 200m of their dwelling. Using these criteria, access to services is much poorer in peripheral areas (Figure 36). There are exceptions of poor access to services in core areas, such as in Wadeville/Reiger Park/Ramaphosa and surrounds in Ekurhuleni, which is a densely populated area, with a high proportion of informal housing. Alexandra also stands out as a yellow, underserved ward, in a field of green in the core. It is notable that Soweto, which,

though peripheral in many other ways, is relatively well supplied with services.

In 2011, households in core areas were more likely to have water provided by municipal or other formal water schemes than those in peripheral areas (Table 39). While the proportions of households obtaining water from water vendors and water tankers may appear small (Table 39), over 10 000 households in the core and 7 600 in the periphery used water vendors, and nearly 26 000 households in the core and 42 500 in the periphery, used water tankers in 2011 (Census, 2011). So, considering capacity, regularity, reliability, inconvenience and, in the case of vendors, cost, continued reliance on these types of water provision is clearly a concern.

Table 39: Household water sources, Gauteng, 2011 (%)

SOURCE: Census, 2011

	Regional/ local water scheme (operated by municipality or other water services provider)	Borehole	Water vendor	Water tanker	Spring	Other
Core	96	1	0.4	1	0.1	1
Periphery	90	4	0.6	3	0.2	2

In 2011, the majority of wards where more than 21 per cent of households did not have access to piped tap water within 200 m of their dwelling, lay in peripheral areas of the province (Figure 37). Overall, over 7 per cent of households in the periphery, and three per cent in the core, faced this problem (Table 40). There were pockets in the core where, for many households, access to water did not meet the basic standards set out by national government (Figure 37). Almost a third of households in the periphery, and a quarter in the core,

only had piped water in their yards (Table 40). This may reflect both apartheid era legacies and recent RDP house-building practices, where indoor plumbing is not always provided (Table 40). Not surprisingly, given differential access to water, according to the GCRO Quality of Life 2015 survey, residents in the periphery were twice as likely as those in the core to be dissatisfied with their water supply (16 per cent, compared to 8 per cent).

Table 40: Household water supplies, Gauteng, 2011 (%)

SOURCE: Census, 2011

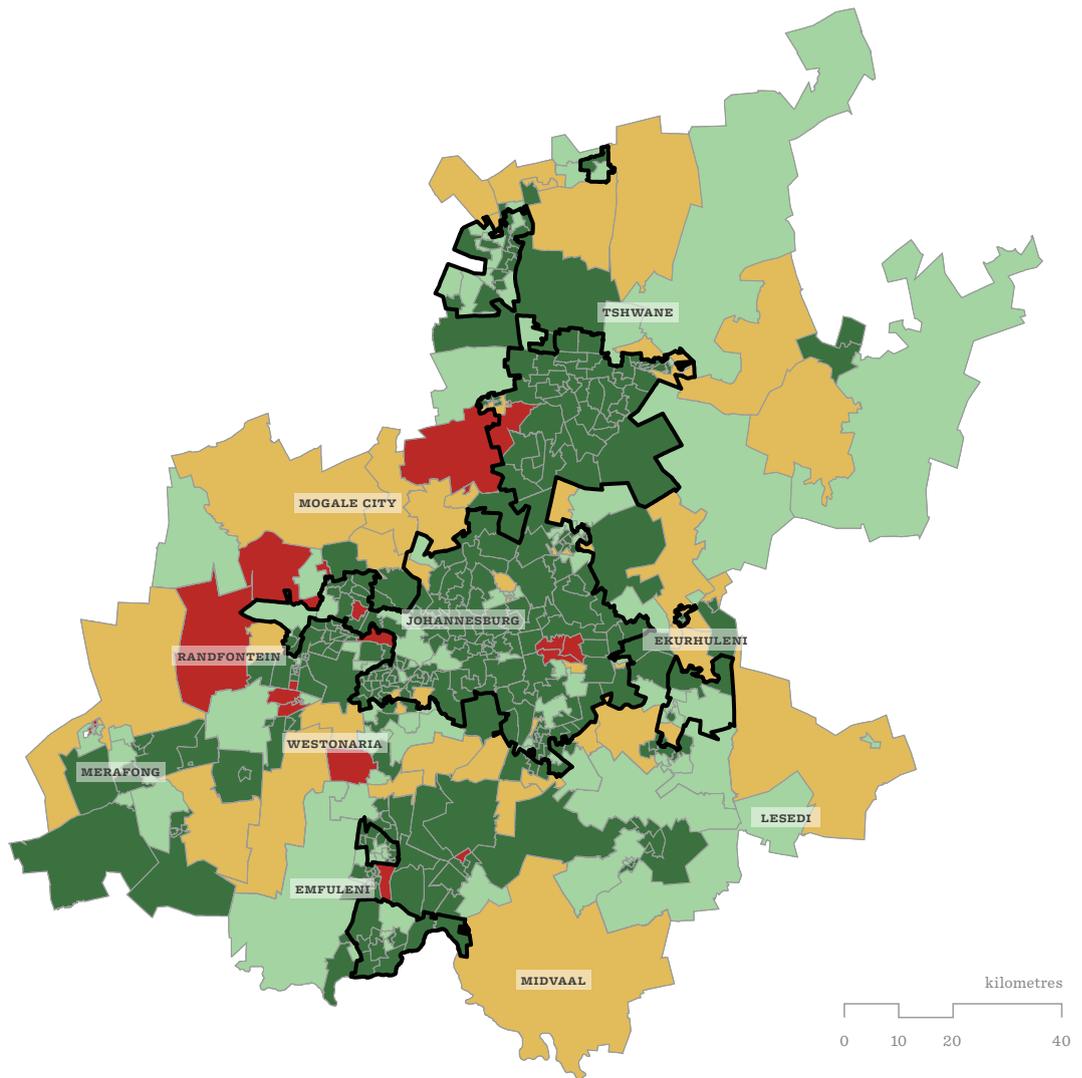
	Piped (tap) water inside dwelling/institution	Piped (tap) water in yard	Piped (tap) water on community stand: distance less than 200 m from dwelling/institution	Piped (tap) water on community stand: distance 200 m-500 m from dwelling/institution	Piped (tap) water on community stand: distance 500 m-1 000 m from dwelling/institution	Piped (tap) water on community stand: distance greater than 1 000 m from dwelling/institution	No access to piped (tap) water
Core	67	25	4	1	1	0.2	1
Periphery	52	31	9	3	1	0.4	3

Photograph by Clive Hassall

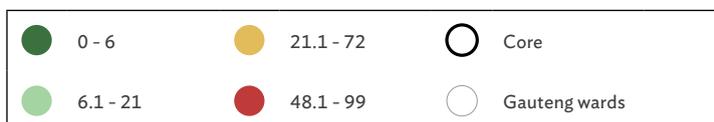


Figure 37: Households with no access to water within 200m per ward (%)

SOURCE: Census, 2011



Households with no access to water within 200m per ward (%)





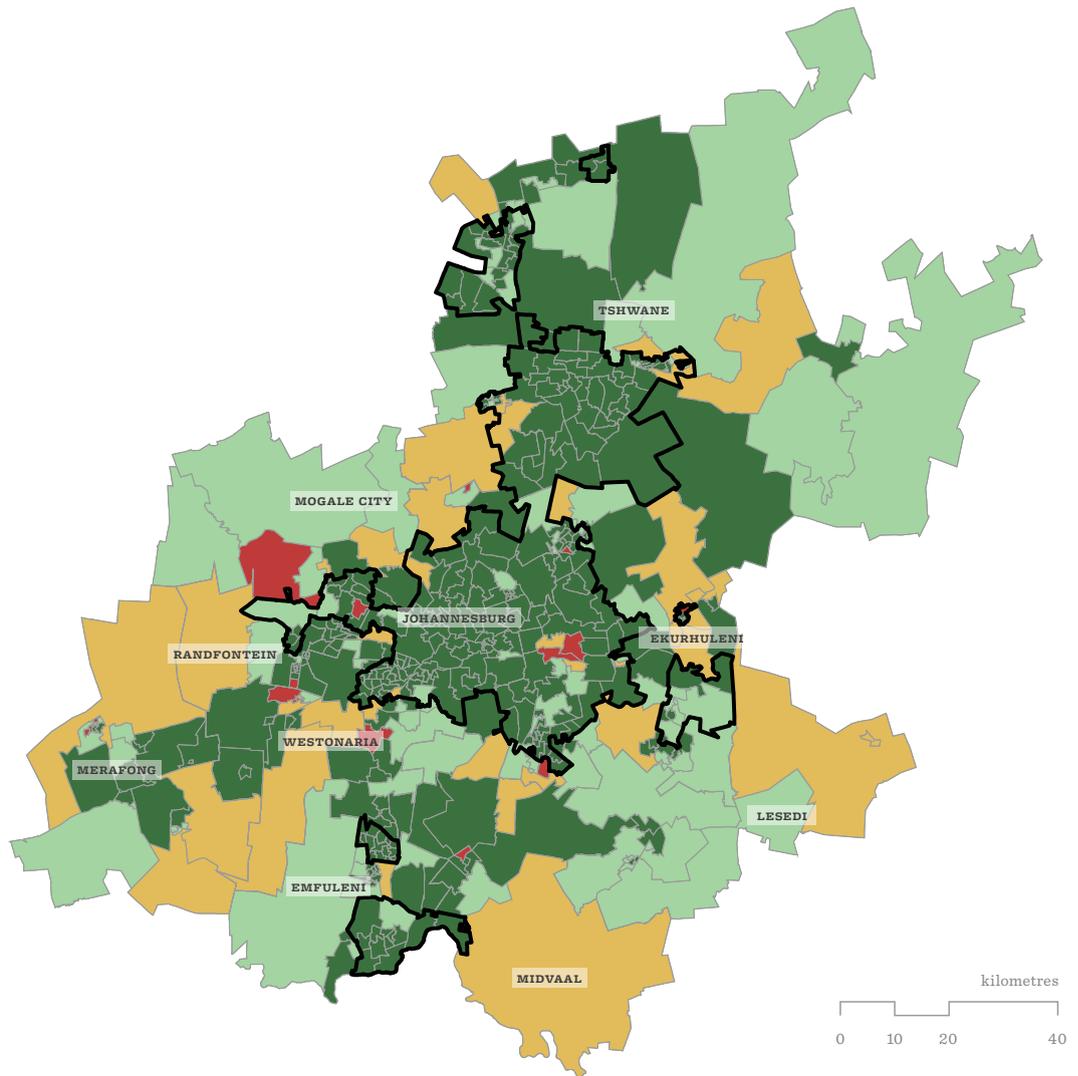
Photograph by Jhono Bennet

Municipalities are replacing conventional electricity meters with pre-paid and smart meters to the extent that the proportion of households using ordinary meters fell in the core from 40 per cent in 2013, to 23 per cent in 2015. In the periphery, the proportion of households using ordinary meters fell from 19 per cent to 11 per cent between 2013 and 2015 (GCRO QoL, 2013, 2015). Households in peripheral areas (69 per cent) were more

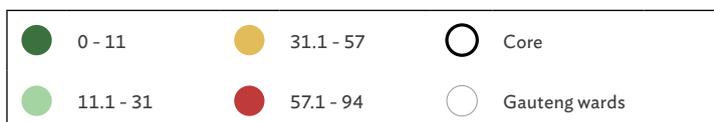
likely to use pre-paid meters than those in core areas (59 per cent) in 2015. The introduction of pre-paid meters for water and electricity, and the contracting out of service delivery and cut-offs, has led to accusations that the privatisation of these services has negative consequences for the poor (McDonald and Ruiters, 2005; McDonald, 2008).

Figure 38: Households not using electricity or gas for cooking per ward (%)

SOURCE: Census, 2011



Households not using electricity or gas for cooking per ward (%)



Energy use in peripheral and core areas of the province differs (Figure 38). Use of fuels other than electricity and gas indicates a lack of access to these services, or an inability to pay for them. In 2011, wards where over 31 per cent of households used fuels other than electricity or gas for cooking were most likely to be in the periphery, with only one stand-out area, in Ekurhuleni, lying within the core (Figure 38). Households in peripheral areas were less likely to use electricity and much more likely to use paraffin and

solid fuels for cooking, than those in core areas (Table 41). Households that use paraffin and solid fuels are vulnerable to respiratory ailments and accidental fires. There was also a significant difference in the use of energy for lighting, with 15 per cent of households in peripheral areas using candles, compared to 6 per cent in the core (Table 41). This has implications for productivity, particularly for learners and students trying to study.

Table 41: Energy used for cooking and lighting (households), Gauteng, 2011 (%)

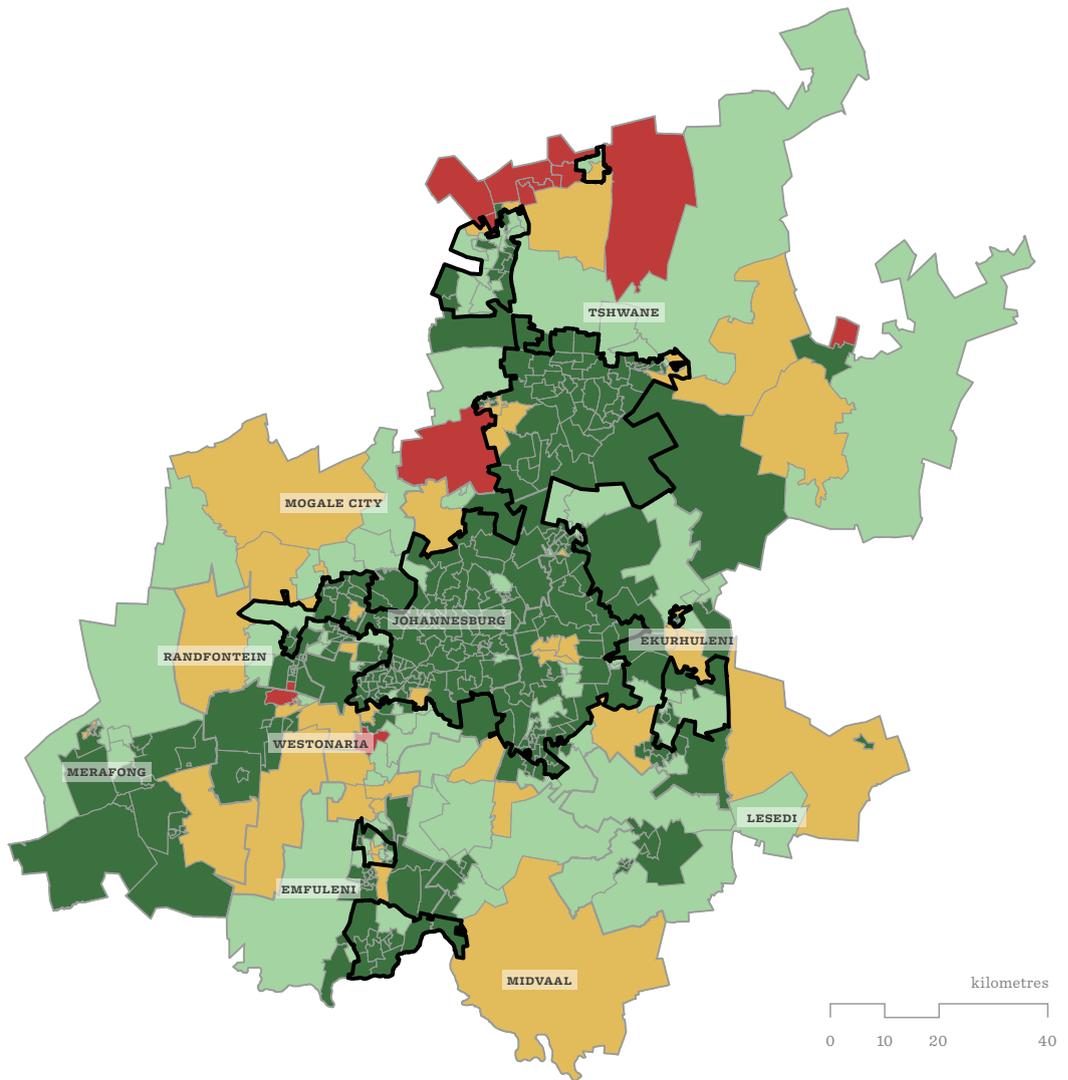
SOURCE: Census, 2011

Energy used for cooking								
	Electricity	Gas	Paraffin	Wood	Coal	Solar	Other	None
Core	88	3	8	0.3	0.2	0.2	0.5	0.1
Periphery	77	3	18	1	0.7	0.2	0.1	0.2

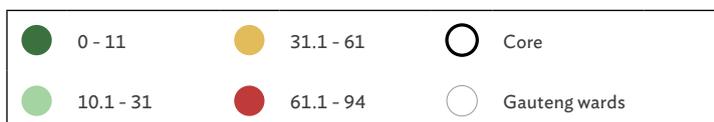
Energy used for lighting						
	Electricity	Gas	Paraffin	Candles	Solar	None
Core	91	0.2	2	6	0.2	0.2
Periphery	80	0.2	4	15	0.2	0.3

Figure 39: Households with no access to flush toilet per ward (%)

SOURCE: Census, 2011



Households with no access to flush toilet per ward (%)



In 2011, the majority of wards where more than 31 per cent of households lacked access to a flush toilet lay in peripheral areas (Figure 39 and Table 42). Households in core areas were most likely to have access to flush toilets (90 per cent, compared to 76 per cent in peripheral areas) (Table 42). Households in peripheral areas were more likely to have to use pit toilets. In 2011, approximately 2 per cent of households in core and peripheral areas still used the bucket system. This amounted to nearly 42 000 households in core areas, and over 27 000 in peripheral areas, who used buckets (Census, 2011). Over 21 000 households in both

core and peripheral areas had no toilet facilities at all (Census, 2011). This has implications for sanitation and human dignity. Households in both informal settlements and formal housing sometimes have to share toilet facilities with a large number of other households (Table 43). The GCRO Quality of Life 2013 survey found that 29 per cent of households in the core, and 27 per cent in the periphery, shared toilet facilities with other households (Table 43). Households in the core were proportionally more likely to share toilets with more than 1 or 2 households than those in the periphery (Table 43).

Table 42: Household access to sanitation, Gauteng, 2011 (%)

SOURCE: Census, 2011

	Flush toilet (connected to sewerage system)	Flush toilet (with septic tank)	Chemical toilet	Pit toilet with ventilation (VIP)	Pit toilet without ventilation	Bucket toilet	None	Other
Core	89	1	1	1	5	2	1	1
Periphery	72	4	2	5	13	2	2	1

Table 43: Households sharing toilets, Gauteng, 2013 (%)

SOURCE: GCRO QoL, 2013

Number of other households sharing toilet facilities	1	2	3	4	5	6+	Households sharing toilet facilities (%)
Core	24	19	16	11	8	22	29
Periphery	33	21	14	6	7	19	27

NOTE: This question was not asked in GCRO QoL 2015.

Refuse removal reflects the extent of services provided by the municipality, the extent of infrastructure available for refuse removal, and the commitment of municipalities and metros to particular areas of their jurisdiction. Lack of access to refuse removal services, and low rates of refuse removal, have implications for the health of communities where this occurs. The problem is even more acute in communities that lack

transport to find alternative means and places to safely dispose their refuse. In 2011, the majority of households in core and peripheral areas of the province had regular weekly refuse removal services (Table 44). However, almost one in five households in peripheral areas did not. These households used their own or communal dumps, or had nowhere to dispose of their rubbish (Table 44).

Table 44: Household refuse removal, Gauteng, 2011 (%)

SOURCE: Census, 2011

	Removed by local authority/private company at least once a week	Removed by local authority/private company less often	Communal refuse dump	Own refuse dump	No rubbish disposal	Other
Core	92	1	1	4	1	0.3
Periphery	81	2	3	11	3	0.5



Photograph by Martin Bolton

8.2 Health

The 2015 GCRO Quality of Life survey asked questions regarding residents' health for the first time. Residents were asked if they or a member of their household had been diagnosed with one or more of a number of conditions. The reliability of responses was dependent on the interviewee knowing about the health status of other members of the household and whether people had been checked and diagnosed with

certain conditions. Table 45 shows the health status of residents. The majority of residents reported that their health did not prevent them from working and/or participating in social activities (Table 46). Overall, 58 per cent of respondents in both areas said no members of their households had been diagnosed with any of the named conditions.

Table 45: Self or member of household diagnosed with any of these conditions in past year, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Hyper-tension	Heart disease or stroke	Diabetes	TB	Cancer	Diarrhoea	Emphysema/bronchitis	Asthma	HIV/AIDS	Influenza/pneumonia
Core	14	4	12	2	3	2	2	6	4	12
Periphery	18	4	10	3	2	1	1	5	5	11

Table 46: Health status, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Health status prevents doing daily work				Health status prevents participation in social activities			
	Always	Some of the time	Hardly ever	Never	Always	Some of the time	Hardly ever	Never
Core	6	23	21	50	5	22	21	52
Periphery	6	22	22	50	5	21	23	51

The GCRO Quality of Life 2015 survey found little difference in the biggest health problems reported by periphery and core respondents in their communities (Table 47). Notably, regardless of where they lived, residents named drug abuse and alcohol as among

the three biggest problems. The latter was seen as a similar-sized problem to HIV/AIDS. Between 2013 and 2015, there was a shift in concern, with HIV/AIDS falling in importance and drug abuse increasing.

Table 47: Biggest health problems in community, Gauteng, 2013, 2015 (%)

SOURCE: GCRO QoL, 2013; GCRO QoL, 2015

	Drug abuse	HIV/AIDS	Alcohol abuse
2013			
Core	19	27	9
Periphery	18	30	12
2015			
Core	24	11	11
Periphery	25	12	11

People in peripheral areas were more likely to use public health-care facilities and less likely to use private health care (Table 48). Although more than seven out of ten users were satisfied with the health-care services provided by the public health facility they usually used, one in five were dissatisfied regardless of where they lived (Table 49). Furthermore, when those who did not use public health-care facilities were asked why they did not, the main reason cited was the quality

of care provided (Table 50). Access to private health-care facilities is influenced by access to medical aid. People without medical aid have to rely on public health services unless they are able to pay private health-service providers from their own pockets. Over three-quarters (78 per cent) of residents in peripheral areas, and 65 per cent in core areas, had no medical insurance (Table 51).

Table 48: Where respondent usually goes for medical care, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Public health-care facilities	Both public and private facilities	Private health-care facilities	Traditional healer	Spiritual healer	Not applicable, don't usually need health care
Core	56	10	25	1	1	7
Periphery	69	7	16	1	1	6

Table 49: Satisfaction with public health care facilities, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Very satisfied	Satisfied	Neither	Dissatisfied	Very dissatisfied
Core	23	50	10	12	5
Periphery	18	52	10	14	6

Table 50: Main reason for not using public health care facilities, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Quality of care	The queues are usually too long	The staff are too unfriendly or unhelpful	The clinic often does not have the medicine I need	I have been before and they could not help me	Cost	I have medical aid	Other
Core	38	11	6	4	3	2	31	5
Periphery	35	10	5	5	3	3	31	8

Table 51: Access to medical aid, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	No medical insurance	Medical aid - All health care in private facilities	Medical aid - Private primary health care/ government hospitalisation	Hospital plan	Other	Don't know
Core	65	22	6	3	1	3
Periphery	78	14	4	2	0	2

8.3 Changing access to services

When it comes to access to services, according to Census data, the lives of residents in Gauteng have changed significantly since 1996. The province, metros and municipalities, as well as parastatals, have evidently attempted to ensure residents in

all parts of the province have access to services. With respect to some aspects of service delivery, the lives of people in peripheral areas have changed the most. Disparity in access to services still exists, however, between households in peripheral areas and those in the core.

Table 52: Household access to water, Gauteng, 1996, 2001, 2011 (%)

SOURCE: Census, 1996, 2001, 2011 (Quantec)

1996	Piped water in dwelling	Piped water on site/in yard	Public tap	Water-carrier/tanker	Borehole/rain-water tank/well	Dam/river/stream/spring	Other
Core	72	17	9	0.5	0.5	0	0.4
Periphery	50	19	22	3	5	0.3	1
2001	Piped water inside dwelling	Piped water in yard	Piped water on community stand: distance less than 200 m from dwelling	Piped water on community stand: distance greater than 200 m from dwelling	Borehole/rain-water tank/well	Dam/river/stream/spring	Water vendor
Core	52	36	5	6	0.2	0	0.1
Periphery	34	41	10	10	1	1	3
2011	Piped (tap) water inside dwelling/institution	Piped (tap) water inside yard	Piped (tap) water on community stand: distance less than 200 m from dwelling/institution	Piped (tap) water on community stand: distance 200 m- 500 m from dwelling/institution	Piped (tap) water on community stand: distance 500 m- 1 000 m (1 km) from dwelling/institution	Piped (tap) water on community stand: distance greater than 1 000 m (1 km) from dwelling/	No access to piped (tap) water
Core	67	25	5	1	1	0.2	1
Periphery	51	33	9	3	1	0.4	3

NOTE: There is no explanation for the drop in the proportion of residents in the core and the periphery who had piped water inside their dwelling in 2001. However, it is likely to reflect increased water delivery to residents in RDP housing, where water is delivered to a tap in the yard and not into the house.

Unfortunately, the categorisation of access to water in the 1996, 2001 and 2011 Censuses is not exactly comparable. Nevertheless, the available categories demonstrate that access to water has improved for many households in the province (Table 52). Yet, perhaps because of population growth and the type of services being provided to new government housing, the proportion of households with access to piped water inside their dwelling barely increased in the periphery between 1996 and 2011 (it rose from 50 per cent to 51 per cent), and the proportion decreased in the core from 72 per cent to 67 per cent (Table 52). However, the proportion of households with access to water on site, in the yard of a property, increased in both core and peripheral areas between 1996 and 2011 (Table 52). There was a decrease in the proportion of households in the province that were reliant on public taps for water. In the periphery this number fell from over one in five households in 1996, to just over one in ten (13 per cent) in 2011 (Table 52). However,

in 2011, people in over 4 per cent of households in the periphery, and 2 per cent in the core, still had to walk more than 200 m to get water. This amounted to over 57 900 households in the core, and 52 300 in the periphery, and in almost 6 200 and 4 600 households, respectively, people had to walk more than one kilometre to get water.

Access to energy has improved significantly since 1996. The energy used by households for lighting has been used here as a marker for change, since residents are least likely to use formally-provided energy for this purpose. In the periphery, the use of electricity for lighting rose from 68 per cent of households to 80 per cent, and in the core from 84 per cent to 91 per cent, between 1996 and 2011 (Table 53). The continued use of flammable paraffin and candles is of concern, however. There has been no significant increase in the use of gas or alternative forms of energy such as solar power (Table 53).

Table 53: Household energy used for lighting, Gauteng, 1996, 2001, 2011 (%)

SOURCE: Census, 1996, 2001, 2011 (Quantec)

	Electricity	Gas	Paraffin	Candles	Solar	Other/None
1996						
Core	84	0.1	2	14	n/a	0.0
Periphery	68	0.3	4	28	n/a	0.0
2001						
Core	86	0.3	2	12	0.1	0.1
Periphery	70	0.2	4	26	0.2	0.2
2011						
Core	91	0.2	2	7	0.2	0.2
Periphery	80	0.2	4	15	0.2	0.3



Photograph by Gareth Pon

Access to clean, hygienic and private sanitation is a basic human need. Although there have been improvements in access to sanitation facilities since 1996, many people in the province still rely on chemical toilets and pit latrines, some of which are not ventilated (Table 54). Between 1996 and 2011, the use of flush toilets grew, and reliance on pit latrines fell throughout the province, particularly in peripheral areas (Table 54). This may reflect the growth in formal RDP housing. Whilst the proportion of households in the core that depended on the bucket system for sanitation remained the

same in 1996 and 2011, it halved in the periphery (Table 54). However, population growth has meant that there has been an increase in the number, if not the proportion, of households in the province relying on the bucket system. This is more notable in the core. In 1996, almost 26 000 households in the core depended on buckets rising to almost 43 000 households in 2011. In peripheral areas the number of households using buckets rose from just over 22 000 to almost 26 500 over the same period (Census, 2011).

Table 54: Household access to sanitation, Gauteng, 1996, 2001, 2011 (%)

SOURCE: Census, 1996, 2001, 2011 (Quantec)

1996	Flush or chemical toilet	Pit latrine	Bucket latrine	Other				
Core	88	8	2	2				
Periphery	65	27	4	4				
2001	Flush toilet (connected to sewerage system)	Flush toilet (with septic tank)	Chemical toilet	Pit latrine with ventilation (VIP)	Pit latrine without ventilation	Bucket latrine	None	
Core	86	2	1	1	7	1	3	
Periphery	62	4	2	3	21	3	5	
2011	Flush toilet (connected to sewerage system)	Flush toilet (with septic tank)	Chemical toilet	Pit latrine with ventilation (VIP)	Pit latrine without ventilation	Bucket latrine	None	Other
Core	89	1	1	1	5	2	1	1
Periphery	72	4	2	5	12	2	2	1

Regular refuse removal improves sanitation and prevents pollution of land and water resources. Weekly removal of refuse by local authorities increased substantially in the decade after 2001, particularly in core areas. In 1996, only two thirds of households in peripheral areas (66 per cent) had weekly collections, but by 2011 this number had risen to eight out of ten (Table 55). By 2011,

over 90 per cent of households in the core had weekly collections. Of concern are the 17 per cent of households in the periphery (and 6 per cent in the core) which had no regular removal of rubbish in 2011. However, this is a significant decrease from 30 per cent of households (and 9 per cent in the core) in 1996.

Table 55: Household refuse removal, Gauteng, 1996, 2001, 2011 (%)

SOURCE: Census, 1996, 2001, 2011 (Quantec)

	Removed by local authority at least weekly	Removed by local authority less often	Communal refuse dump	Own refuse dump	No rubbish disposal
1996					
Core	87	4	2	5	2
Periphery	66	4	6	19	5
2001					
Core	88	2	2	6	2
Periphery	68	3	4	20	5
2011					
Core	92	1	1	4	1
Periphery	81	2	3	11	3

Access to services not only reflects the type of housing people live in, but also reflects the success of the state in providing services. In the context of a rapidly increasing population, this can be a difficult task. The data suggests that in respect of water supply, much is lacking and the state is failing to keep up with demand (McDonald and Ruiters, 2005). Households are still disadvantaged, with a lower proportion of households in the core having a tap inside the house in 2011 than in 1996, and only just over half of households in the periphery (Table 52). Similarly, improvements in sanitation are not significant. Although the situation

has improved in peripheral areas, only just over three quarters of households have a flush toilet (Table 54). However, significant improvements have been made in refuse removal and access to electricity, in both core and peripheral areas, even though one in five households in the periphery still does not use electricity for lighting. The unevenness of improvement in service delivery between the core and periphery indicates that the state is attempting to tackle uneven development in the sphere of infrastructure and services. But, importantly, even though the proportion of households with better

housing and access to services has increased for most types of service delivery since 1996, because of the growth in the population of the province, the number of households and individuals lacking access to housing and services has increased.

8.4 Satisfaction with services

Receiving services is one thing, being satisfied with the service one gets, is quite another. Even when dwellings are formal brick and mortar structures, they may not be appropriate for the needs of a household. Water and electricity supplies are sometimes intermittent. Toilet facilities may not be of the flush type, or may be shared. Sewers may be prone to overflowing and breakage. Pit and other latrines may not be maintained or emptied regularly. And the cost of services may

be considered too high, and the administration of billing, inefficient.

The GCRO Quality of Life 2015 survey asked respondents how satisfied they were with the services received. Overall, there were relatively high levels of satisfaction (Table 56). At the same time, however, a relatively significant proportion of residents were dissatisfied with the services they received, particularly those living in peripheral areas (Table 56). Some 27 per cent of residents in the core, and 31 per cent in the periphery, were dissatisfied with the cost of services provided by municipalities and metros (Table 53). And 31 per cent of residents in peripheral areas, and 28 per cent in core areas, were dissatisfied with billing processes (Table 56).

Photograph by Clive Hassall



Table 56: Satisfaction with services, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Very satisfied	Satisfied	Neither	Dissatisfied	Very dissatisfied
Dwelling					
Core	28	51	6	10	6
Periphery	20	48	6	15	10
Water					
Core	26	61	6	5	3
Periphery	19	59	6	9	7
Sanitation					
Core	24	55	8	8	6
Periphery	18	50	8	13	11
Waste removal					
Core	24	58	7	6	4
Periphery	18	56	7	10	9
Energy sources					
Core	21	53	11	10	6
Periphery	16	52	11	12	9
Cost of municipal services					
Core	13	37	23	18	9
Periphery	9	35	26	20	11
Billing of municipal services					
Core	13	36	24	18	10
Periphery	9	34	26	20	11

“Satisfaction with energy supply may have been affected by the rolling blackouts that occurred at times of high energy use.”

Considering that, in 2011, 28 per cent of respondents in peripheral areas, and 15 per cent in the core, lived in informal housing, and a third of households in core and peripheral areas lived in 1 or 2 rooms, it is perhaps not surprising that 25 per cent of residents in peripheral areas, and 16 per cent in the core, were dissatisfied or very dissatisfied with their dwelling (Census, 2011 and Table 56).

Dissatisfaction with levels of services provided through parastatals, municipalities and metros was slightly lower. Levels of expectation with regard to water provision may generally be low, since although only 67 per cent of households in core areas, and 52 per cent in the periphery, had piped water in the dwelling (Census, 2011), only 8 per cent of residents in core areas, and 16 per cent in the periphery, were dissatisfied with the water services they received (Table 56). Satisfaction levels may also reflect increasing water delivery in the intervening years. Residents were less satisfied with sanitation services

(Table 56). Although 90 per cent of households in core areas, and 76 per cent in the periphery, had access to a flush toilet in 2011 (Census, 2011), in 2015, 14 per cent of residents in core areas, and 24 per cent in the periphery, were dissatisfied with sanitation services (Table 56). This may be because many households have to share their toilet facilities with others. Residents were slightly less likely to be dissatisfied with waste removal services (19 per cent in the periphery, and 10 per cent in the core) (Table 56). Energy is provided by the parastatal Eskom, sometimes through a municipality or metro, and at other times, directly. Satisfaction with energy supply may have been affected by the rolling blackouts that occurred at times of high energy use. So, although 91 per cent of households in the core, and 80 per cent in the periphery, had access to electricity in 2011 (Census, 2011), 16 per cent of respondents in the core, and 21 per cent in the periphery, were dissatisfied with their energy source or supply (Table 56).



Photograph by Simphiwe Phumo

9. Satisfaction with government, participation in politics and attitudes to democracy

9.1 Satisfaction with government

One indicator of peripherality is lack of access to government. Yet, GCRO Quality of Life 2015 survey data shows that in Gauteng, residents of the periphery do not seem to be disadvantaged in this regard. Over a third of residents in both core and peripheral areas had contacted a government department in the previous three months (39 per cent in the periphery, and 35 per cent in the core) (Table 57). Residents in the periphery were less likely to say they never interacted with government.

Of those who had contacted government departments in the previous three months, the majority, regardless of where they lived, felt they had

been assisted within a reasonable amount of time, their needs had been met, and they had been treated with respect and dignity (Table 58). Notwithstanding these responses, less than a third thought government officials abided by the Batho Pele principles of 'putting people first'. There are many allegations of corruption at all levels of government, including in the South African Police Services (SAPS) and metropolitan traffic police, and nearly one in five respondents (17 per cent) in the core, and more than one in ten respondents in the periphery (12 per cent), said they had been asked to pay a bribe.

Table 57: Interaction with government departments, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Never interact with government officials	Contacted government department in past 3 months	Assisted within a reasonable amount of time	Needs were met	Was treated with respect and dignity	Think government officials abide by Batho Pele principles
1996						
Core	23	35	64	79	76	27
Periphery	20	39	65	82	78	30

Although residents may be unsure of the responsibilities of the different levels of government, the GCRO Quality of Life 2015 survey asked residents which level of government had most improved their quality of life (Table 58). Notably, 42 per cent of residents in the periphery, and 44 per cent in the

core, said none of the different levels had. Otherwise, responses were fairly similar, with residents in the periphery having slightly more confidence in the efficacy of national government than those in the core (Table 58).

Table 58: Which level of government has most improved quality of life, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	National government	Provincial government	Local municipality	None of them
Core	28	9	19	44
Periphery	32	8	18	42

Notwithstanding relatively high levels of satisfaction with their interactions with government departments, residents, particularly those living in peripheral areas, were generally less satisfied

with the various tiers of government (Table 59). This may be because of the poorer levels of service delivery and higher levels of unemployment in peripheral areas.

Table 59: Satisfaction with various levels of government, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Very satisfied	Satisfied	Neither	Dissatisfied	Very dissatisfied
National					
Core	9	29	21	23	17
Periphery	8	32	17	27	16
Provincial					
Core	7	32	24	22	15
Periphery	6	33	21	26	15
Local					
Core	7	29	22	24	18
Periphery	5	26	18	29	21

9.2 Participation in politics

In the GCRO Quality of Life 2015 survey, residents were asked about activities related to the development of their community, their participation in politics, and their opinions about the state of democracy in South Africa. Almost half of residents in core areas, and 40 per cent in peripheral areas, had not taken part in any meetings or activities related to their community in the previous year (Table 60). Of the many residents, particularly in peripheral areas, who had participated

in meetings, the most commonly attended meetings were ward, street committee or residents association, and school governing body meetings (Table 60).

Around one in ten people had participated in community development forum meetings, but mayoral imbizos (attended by 3 per cent of residents in the core, and 4 per cent in the periphery) and Integrated Development Plan meetings (attended by 2 per cent of residents in both areas), were apparently of very limited interest to residents.

Table 60: Participation in activities or meetings in past year, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	None	Ward meeting	Street committee or residents association	Community development forum	Community policing forum	School governing body
Core	48	26	26	9	8	18
Periphery	40	36	33	11	8	18

According to the GCRO Quality of Life 2015 survey, as many as 80 per cent of Gauteng residents (regardless of where they lived) were registered voters, and of these, 78 per cent in the core, and 80 per cent in the periphery, said they planned to vote in the next local election (2016). Yet, only 58 per cent of registered voters in the province did vote in the local elections held in August 2016 (*News24*, 7 August 2016). Of those who said they would not be voting, the most common

reasons appear to be a lack of confidence in politics and the power of their vote to changes in their life (Table 61). Where people lived did not seem to make much difference, although people in the periphery were more likely to lack an identity document, which suggests that access to the Department of Home Affairs may be lacking for people living in peripheral areas (Table 61).



Photograph by Helen Riding

Table 61: Reasons why not planning to vote in 2016 local government elections, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Don't like politics, broken promises, waste of time	Does not think his/her vote will make any difference	Don't care	Don't know who to vote for	Local elections don't matter	No Identity document	Not allowed to vote, for example not RSA citizen	Other
Core	27	21	12	7	4	6	21	3
Periphery	26	22	9	7	3	11	20	2

Although some registered voters showed a lack of confidence in the effectiveness of their vote, there was a degree of confidence in the election process itself. However, as many as one in five (20 per cent) residents in the core, and 18 per cent in the periphery, did not think that the 2016 local election would be free and fair (GCRO QoL, 2015). Just over half were confident that it would be (52 per cent in the core, and 53 per cent in the periphery). These attitudes are of concern since over six out of ten residents in both areas said

they thought the country was going in the wrong direction (Table 62).

The attitudes and opinions of residents relating to politics and democracy were relatively similar in core and peripheral areas (Tables 62 and 63). People had some confidence in their ability to influence matters that affected them, but around a third thought they could not (Table 62). Sadly, 27 per cent of residents in the core, and 30 per cent in the periphery, said nobody cared about people like them.

Table 62: Attitudes to politics, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

Politics is a waste of time					
	Strongly agree	Agree	Neither	Disagree	Strongly disagree
Core	14	24	14	34	14
Periphery	12	24	14	37	13
People like you cannot influence developments in your community					
Core	8	22	18	37	15
Periphery	7	25	18	38	12
The country is going in the wrong direction					
Core	24	37	16	18	6
Periphery	22	40	16	18	5

Although the majority of residents in the GCRO QoL 2015 survey thought the country was going in the wrong direction, they had relatively strong confidence in democracy in South Africa (Table 62 and 63). However, their responses do show cause for concern. Over a quarter of residents in both areas did

not think that the judiciary is free from government influence, and almost a third questioned the freedom of the press. Strong concerns about corruption were expressed, with over eight out of ten residents, in both areas, saying that corruption is the main threat to democracy in South Africa.

Table 63: Attitudes to democracy, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

Judiciary is free from government influence					
	Strongly agree	Agree	Neither	Disagree	Strongly disagree
Core	11	31	30	21	7
Periphery	9	33	31	21	5
Corruption is the main threat to our democracy					
Core	43	40	10	6	2
Periphery	39	44	10	6	1
Press is free to say or write what it likes					
Core	15	35	20	23	8
Periphery	13	37	20	23	6

10. Living in core and peripheral areas in Gauteng

If peripheral areas are imagined as rural, people living there could be thought of as living bucolic lives, untroubled by the stresses of living in high-density urban areas, with noise, traffic and crime. Rural life is also sometimes imagined as being more ‘communal’

than city life, with people knowing and trusting their neighbours. But, if peripheral areas are not always the rural spaces of imagination, are they then sites of high-density living, social marginalisation, and social (in)-cohesion?

10.1 Community

The GCRO Quality of Life 2015 survey asked residents about the community and neighbourhoods they lived in. There were no significant differences between core and peripheral areas in the reasons residents gave for living where they did (Table 64). Residents were most influenced by affordability, length of residence in the suburb, convenience, and family nearby (Table 64). When asked where they would prefer to live in Gauteng, there were some differences.

Perhaps predictably, residents in the periphery (30 per cent) were more likely than those in the core (25 per cent) to say they would prefer to live in 'a quiet rural area or small town'. Approximately a quarter in both areas said they would like to live in 'a trendy inner-city apartment'. Notions of a brick house in the suburbs, with a garden, still hold strong. This was the preference of 48 per cent of residents in the core, and 45 per cent in the periphery.

Table 64: Most important reason why you live in your suburb, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Affordability of property	Always lived here	Easy to get to work	Family lives nearby	Quality of property
Core	26	19	13	11	6
Periphery	27	21	12	13	4

NOTE: Percentages do not add up to 100 per cent as only the five most-frequently given answers are shown.

Access to amenities and services varies between neighbourhoods. With the exception of nursery schools, residents in core areas were much more likely to have useful services within walking distance of their homes (Tables 65 and 66). This applied to amenities useful in everyday life such as supermarkets

and banks, as well as those for finding jobs and running businesses. With the exception of hair salons, people living in core areas were also significantly more likely to have access to liquor stores, bars and clubs, and clothing stores (Table 66).

Table 65: Amenities in walking distance of home (750 m), Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Transport	Super-market	Bakery	Bank	Nursery school	Internet café	Business services	Hardware supplier
Core	66	71	44	46	45	47	32	40
Periphery	63	57	28	31	42	33	20	30

Table 66: Other amenities in walking distance of home (750 m), Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Clothing	Hair salon	Liquor store	Bars and clubs
Core	39	64	54	45
Periphery	25	62	47	39

The GCRO Quality of Life 2015 survey found that residents in the core (32 per cent) were slightly more likely than those in the periphery (29 per cent) to say that their community or suburb had improved in the previous year, but they were also more likely to say that things had deteriorated (17 per cent in the core, and 14 per cent in the periphery). More than half in both areas said there had been no change. Residents were most concerned about crime, with 36 per cent in the core, and 38 per cent in the periphery, naming it as the biggest problem in their community. This could be related to the second most-named problem, drugs (17 per cent in the core, and 15 per cent in the periphery). Unemployment was the third most-named problem, cited by 14 per cent of residents in the core, and 16 per cent in the periphery.

10.2 Crime and community safety

Regardless of where they lived, residents of the province were concerned about crime and many did not feel safe in their neighbourhoods. Entrepreneurs named it as the main constraint on business (GCRO, QoL, 2015). In the GCRO Quality of Life 2015 survey, 39 per cent of residents in the core said crime had worsened in their area in the past year, and almost half of residents who lived in peripheral areas said the same (Table 67). Only around one in five residents in both areas said that levels of crime in their area had decreased. Being a victim of crime may affect perceptions of crime. One in five residents in both areas said they had been a victim of crime in the previous year (GCRO QoL, 2015).

Table 67: Perceptions of crime, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

In the past year has crime in this area			
	Improved	Stayed the same	Got worse
Core	22	39	39
Periphery	19	35	46

Perceptions and experiences of crime affect how safe people feel at home and in their neighbourhoods. The majority of residents in Gauteng felt safe in their homes and when they walked in their area during the day (Table 68). In both core (58 per cent) and peripheral areas (68 per cent), the majority of people felt unsafe walking in their area after dark. This fear affects people's quality of life since many leave for work in the morning in the dark, and return

in the dark, especially during the winter months. Streetlights increase safety in the dark. As many as 22 per cent of residents in peripheral areas and 20 per cent in core areas were dissatisfied with the provision of street lights in their areas. A further 10 per cent of residents in core areas, and 22 per cent in peripheral areas, said they had no street lights (GCRO QoL, 2015).

Table 68: Perceptions of safety, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Very safe	Fairly safe	Neither	Bit unsafe	Very unsafe
How safe feel walking in area during the day					
Core	31	42	9	12	6
Periphery	29	43	8	13	6
How safe feel walking in area after dark					
Core	8	22	12	23	35
Periphery	5	17	9	25	43
How safe feel at home					
Core	40	36	9	10	6
Periphery	34	38	9	11	7

Less than half of all residents in the GCRO QoL 2015 survey were satisfied with the safety and security provided by government (Table 69). Over a third in the core (37 per cent), and 43 per cent in the periphery, were dissatisfied (Table 69). People in the periphery were much less satisfied with the services provided by metro and traffic police (Table 69). And, if something unfortunate was to happen, residents in

all areas, but particularly those in peripheral areas, showed little satisfaction with emergency services (Table 69). Overall, people in the periphery appeared to be more nervous about safety, and less satisfied with the security provided by government, which raises questions about where resources are, and should be, focused.

Table 69: Satisfaction with safety and security services provided by government, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Very satisfied	Satisfied	Neither	Dissatisfied	Very dissatisfied
Safety and security					
Core	9	32	22	23	14
Periphery	6	31	21	27	16
Metro/traffic police					
Core	12	38	21	18	11
Periphery	7	32	20	25	17
Emergency services (e.g. fire and ambulance)					
Core	12	36	20	19	14
Periphery	7	29	17	27	20



Photograph by Mikey Rosato

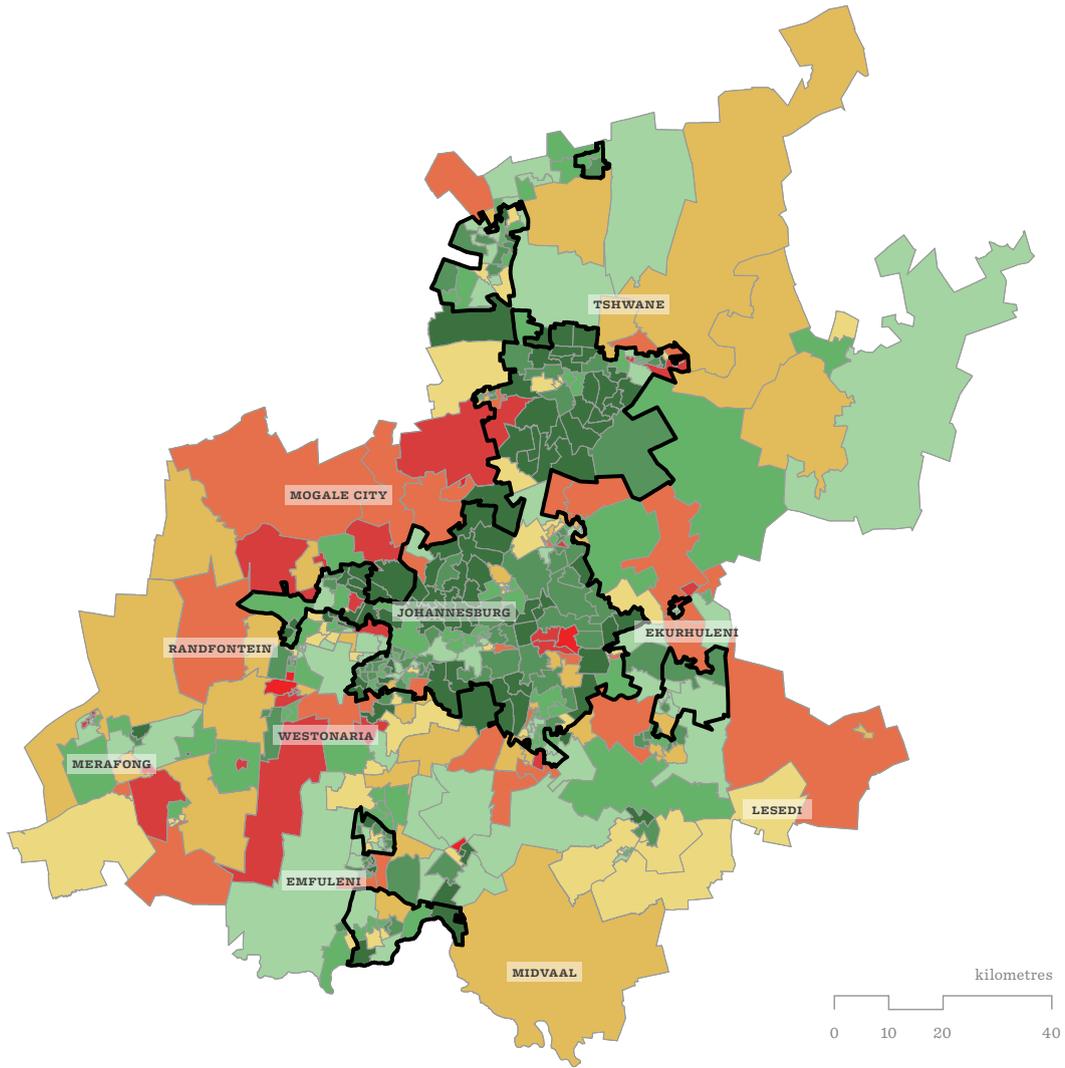
10.3 Household goods

Ownership and investment in household goods reflects the income of a household, their aspirations and can also reflect their investment in an area. Ownership of household goods (or lack of them), also reflects poverty and inequality as they are a form of asset. A household goods index was created using Census 2011 data, which added together the proportions of households, per ward, without access to a radio, television, stove or fridge (Figure 40). Wards in peripheral areas were more likely to score highest on this index – i.e. have higher proportions of households without these goods. Notably, wards in mining areas had high proportions of households without stoves or fridges (Figures 41 and 42, Table 70). Peripheral areas were also

home to wards with high proportions of households without radios, televisions and cars, affecting their connectivity (Table 70 and Figures 65, 69 and 70). This may be because many parts of peripheral areas and wards are home to migrant workers (particularly as many are located in mining areas) who may be investing in these items in their other homes (Peberdy, 2013a). Overall, households in peripheral areas are less likely to have basic household goods. This may not only reflect lower levels of investment in their communities and homes, but also low incomes, vulnerability of people living in informal dwellings to crime, and generally lower standards of living for households in peripheral areas.

Figure 40: Household goods index

SOURCE: Census, 2011



Household goods index

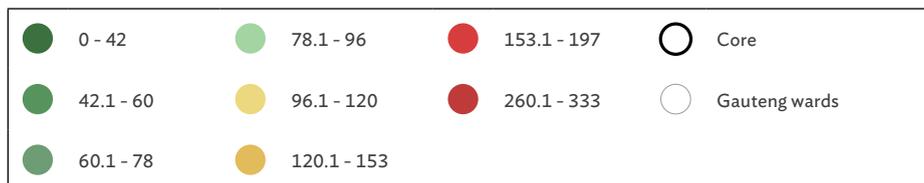
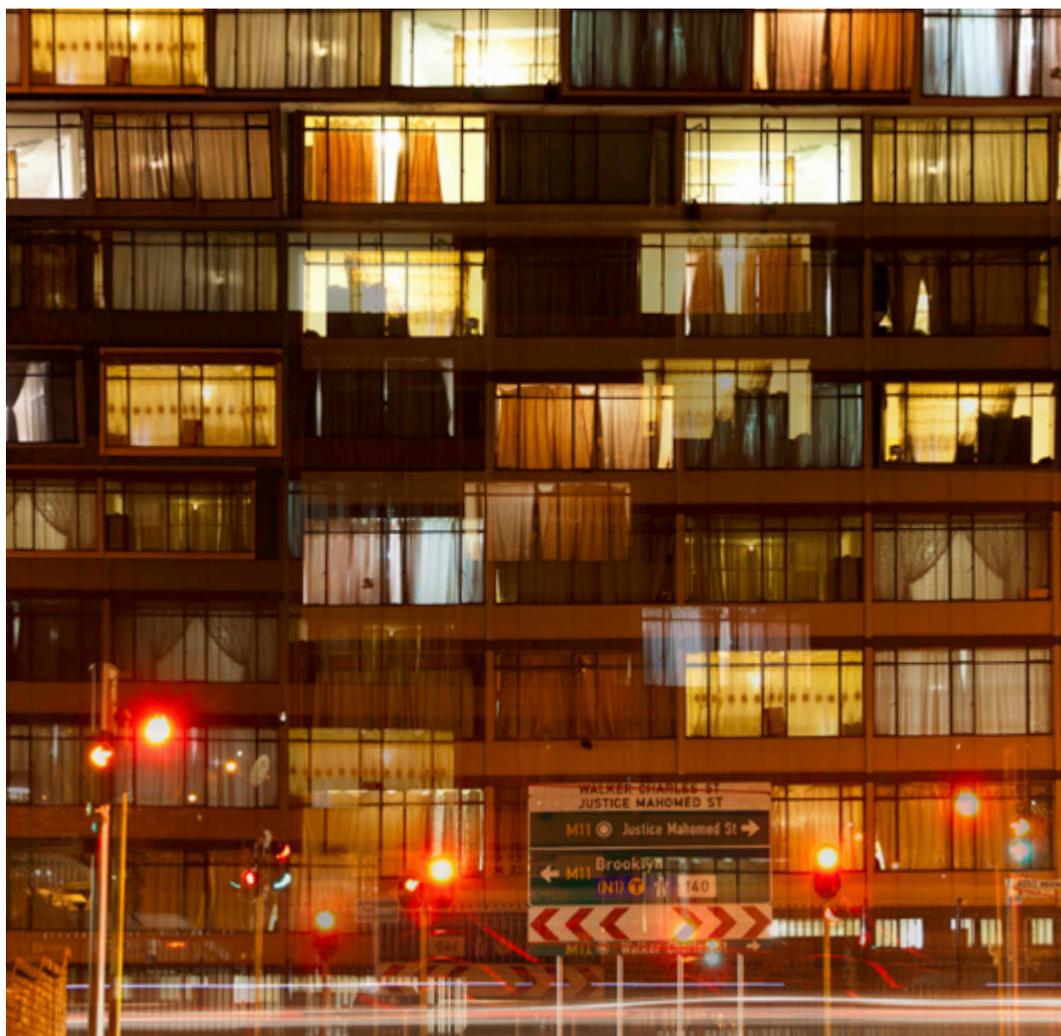


Table 70: Ownership of household goods, Gauteng, 2011 (%)

SOURCE: Census, 2011

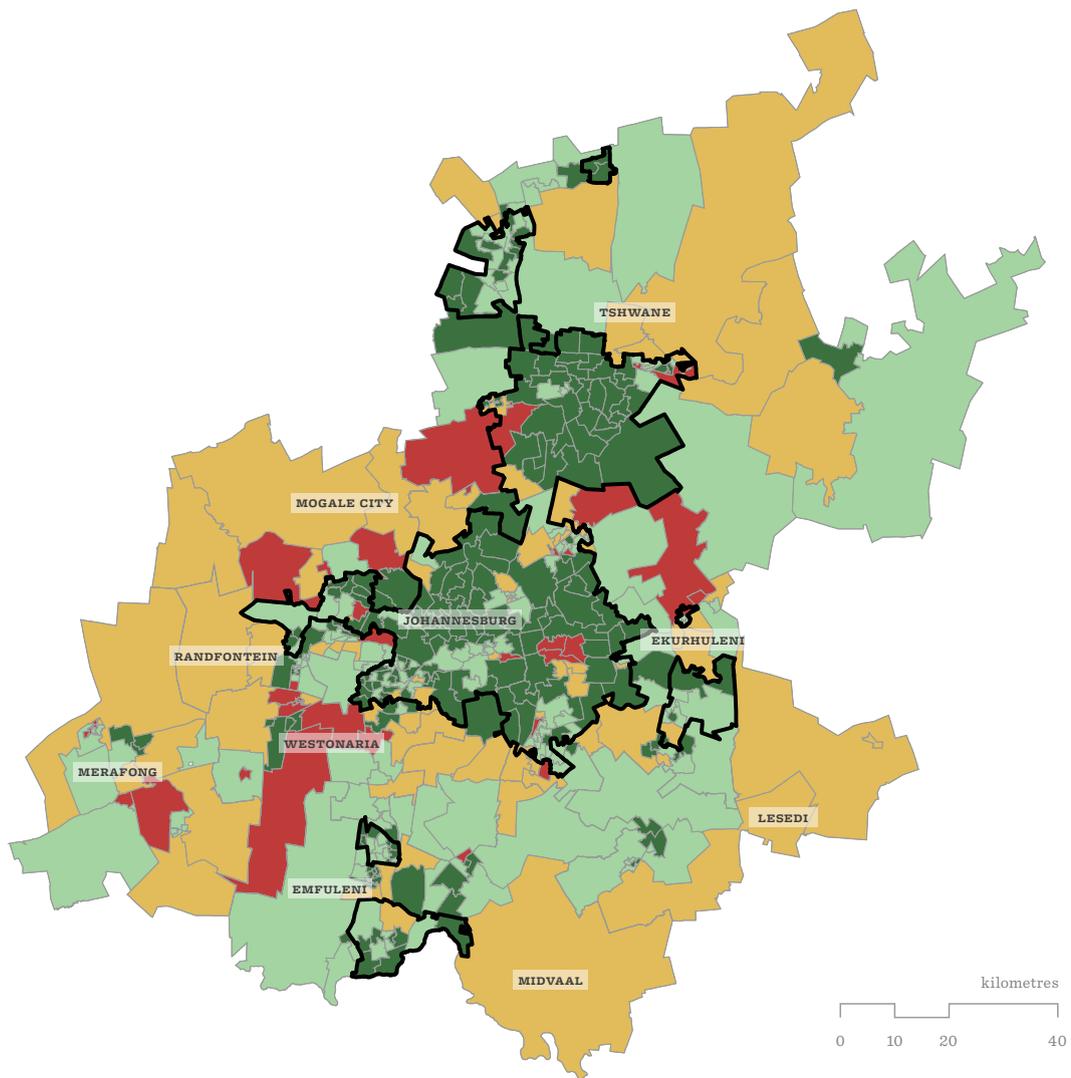
	Radio	Television	Stove	Fridge	Washing machine	Car	Cell phone
Core	72	84	88	77	45	42	95
Periphery	65	75	78	65	35	30	92



Photograph by Lesedi Mogale

Figure 41: Households with no fridge per ward (%)

SOURCE: Census, 2011



Households with no fridge per ward (%)

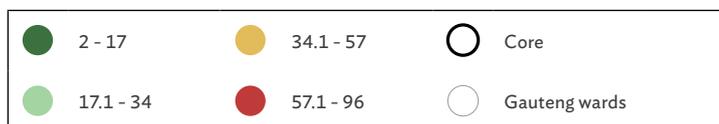
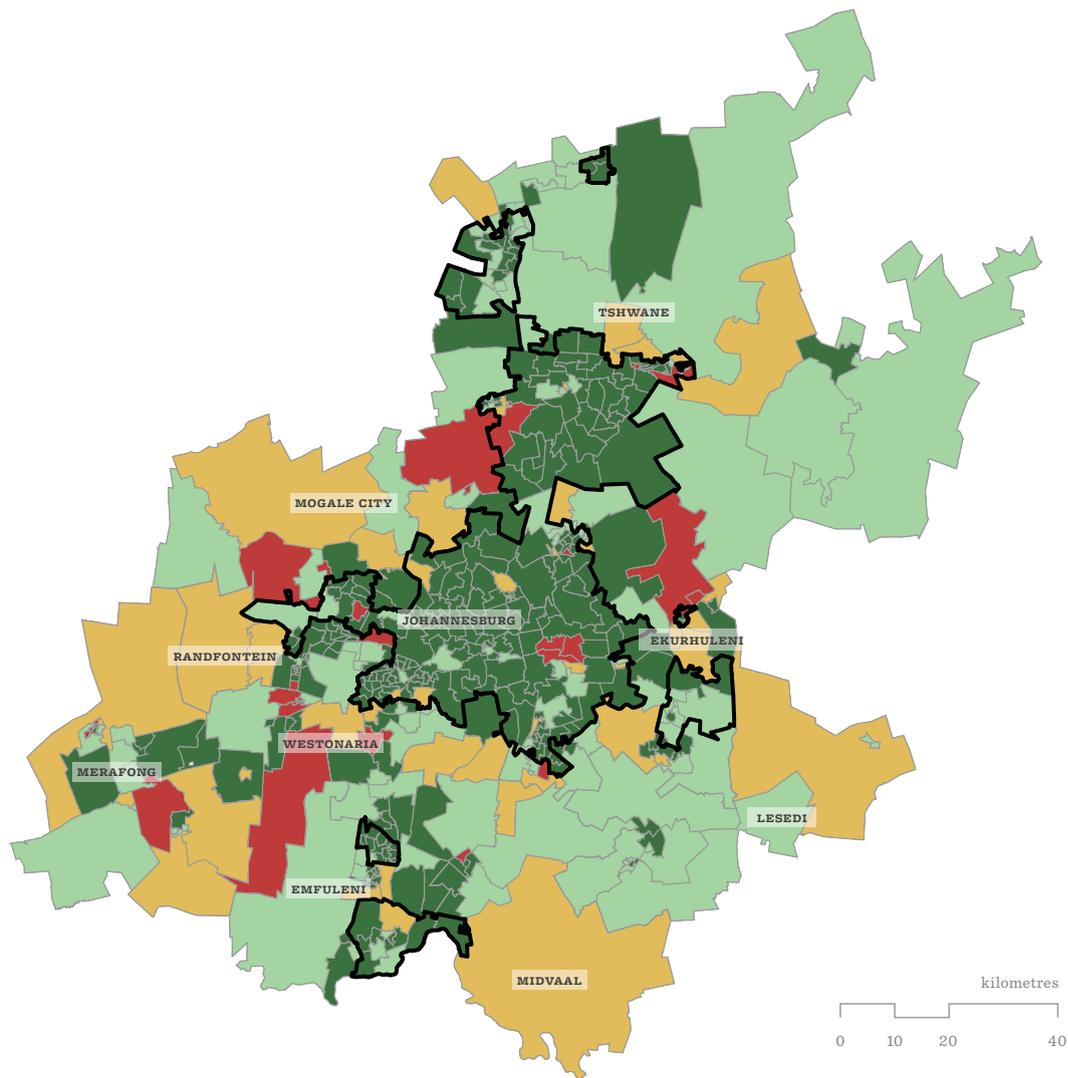
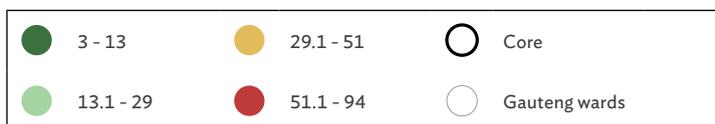


Figure 42: Households with no stove per ward (%)

SOURCE: Census, 2011



Households with no stove per ward (%)



10.4 Social cohesion

Levels of social cohesion may be difficult to establish when there are high levels of mistrust among residents. Sadly, more than three quarters of respondents in the GCRO Quality of Life 2015 survey (76 per cent in the core, and 79 per cent in the periphery), when asked if people in their community could be trusted, said 'you need to be very careful'. Only 14 per cent in both areas felt most people could be trusted. There were some differences in the opinions of residents in core and peripheral areas around race, gender and migration as well as attitudes to, and acceptability

of violence towards, other residents who they perceived as different.

Around 60 per cent of respondents agreed with the statement that 'blacks and whites will never really trust each other', suggesting there is some way to go as regards social cohesion and race (Table 71). Also troubling were the 28 per cent of residents in the core, and 32 per cent in the periphery, who agreed that 'Indians do not deserve to benefit from affirmative action'. Only about a third in both areas thought coloured people were playing an important role in building the country.

Table 71: Race and social cohesion, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Strongly agree	Agree	Neither	Disagree	Strongly disagree
Blacks and whites will never really trust each other					
Core	27	31	17	17	8
Periphery	25	36	16	17	6
Indians do not deserve to benefit from affirmative action					
Core	6	22	24	35	13
Periphery	6	26	26	33	10
Coloured people are playing an important role in helping to build the new South Africa					
Core	9	24	27	28	12
Periphery	8	22	28	32	10

In a country where hostile attitudes towards lesbian, gay, bisexual, transsexual and intersex people (LGBTI) are regularly expressed, and 'corrective' rape takes place, what were residents' attitudes towards gay and lesbian people? The GCRO Quality of Life 2015 survey found that only 56 per cent of residents in the core, and 57 per cent in the periphery, thought gay and lesbian people should have the same rights as other South Africans (Table 72). And 30 per cent of people in the core, and 28 per cent in the periphery, disagreed. Even more troubling, 15 per cent of residents in the core, and 13 per cent in peripheral

areas, said it was 'acceptable to be violent towards gays and lesbians' (Table 72). Attitudes towards gay and lesbian people are even more disturbing when considered in the light of the acceptability of other forms of social violence. Domestic violence, particularly against women, is a significant problem in South Africa. Two per cent of residents, regardless of where they lived, thought it could be acceptable for a man to hit his partner. One per cent of the adult population of the province is the equivalent of around 100 000 adults.

Table 72: Attitudes towards gays and lesbians, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Strongly agree	Agree	Neither	Disagree	Strongly disagree
Gays and lesbians deserve equal rights					
Core	19	37	14	18	12
Periphery	17	40	15	18	10
It is acceptable to be violent towards gays and lesbians					
Core	4	11	14	42	30
Periphery	3	10	14	46	27

The outbreak of xenophobic violence of 2008 that claimed the lives of at least 62 people (of whom it is thought around 30 were South Africans) started in Alexandra, which, although located in the core of the province, consistently appears in the maps in this report as socio-economically marginal or peripheral. In 2008 the violence spread to Jeppe, near the Johannesburg CBD, and Ramaphosa in Ekurhuleni, both peripheral areas located within the core of the province. Xenophobic attacks had occurred across the province prior to May 2008, and continued subsequently. In January and April 2015, there were other widespread but less murderous outbreaks of violence in areas of Soweto, and again, in Jeppe. Attacks continue to be perpetrated across the province, often in townships and informal settlements where people live precarious lives. South Africans interviewed in the GCRO Quality of Life 2015 survey expressed strong hostility to foreigners, and 25 per cent of South Africans, regardless of where they lived, agreed with the statement that Gauteng was 'for South Africans only and that all foreigners should be sent back to their home countries'. Only three per cent, however, said it was 'OK' to physically attack foreigners to make them leave. Not all are hostile as 57 per cent said that legal foreigners were acceptable, and a further 18 per cent thought that all foreigners should be allowed to stay. However, some people do

not just regard foreigners as surplus in Gauteng as some would also like to limit the movement of other South Africans into the province. As many as 43 per cent of respondents in both core and peripheral areas agreed with the statement 'there are too many people coming to Gauteng, we should bring back influx control'.

Thus, it seems that where people live does not make a significant difference to their attitudes towards each other. However, the attitudes of some people towards those they perceive as different to themselves, and the acceptance of violence, particularly towards gay and lesbian people, are of great concern.

10.5 Quality of life

There has been little research focused on the quality of life in core and peripheral areas. The literature suggests that, depending on the indicators used, quality of life may be perceived to be higher in some peripheral areas, particularly rural and semi-rural areas, than in core areas (Ilbery, 1984; Oppong et al., 1988). In Gauteng, there was little difference between people living in core or peripheral areas between levels of satisfaction with a whole range of areas of life (Table 73), although residents in the core were slightly more likely to be satisfied (Table 73).

Table 73: Life satisfaction, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Very satisfied	Satisfied	Neither	Dissatisfied	Very dissatisfied	
Life as a whole						
Core	22	48	15	11	5	
Periphery	18	48	16	13	5	
Amount of time you have to do things you want to do						
Core	12	52	14	16	5	
Periphery	9	53	13	18	6	
Leisure time						
Core	19	54	14	10	3	
Periphery	14	55	16	12	3	
Friends						
Core	21	57	14	7	2	
Periphery	17	58	16	7	2	
Family						
Core	35	49	6	7	2	
Periphery	30	54	6	8	2	
Marriage or relationship						No relationship
Core	28	38	7	2	2	23
Periphery	25	38	7	3	2	25

Quality of life can be enhanced by exploring hobbies, watching or participating in sport, visiting parks and botanical gardens and going to art galleries, museums and heritage sites. Libraries are both recreational and study spaces, and for some households, including some learners, these are their only access to books. The GCRO Quality of Life 2013 survey asked respondents about their use of various facilities. In all cases, people living in peripheral areas were less likely to make use of recreational facilities (Table 74). This may be because they are not readily available in these areas. In the GCRO Quality of Life 2015 survey, over

a third (35 per cent) of residents in the periphery, and almost a quarter (23 per cent) in the core, said there were no libraries near them. Library users living in the core were more satisfied with their local library (49 per cent) than those in the periphery (36 per cent). Similarly, residents in the core (51 per cent) were much more satisfied with local parks and public spaces than those in the periphery (35 per cent). In the periphery, more than half (54 per cent) were dissatisfied with their local parks and public spaces. Lack of access to libraries and parks affects the quality of people's lives detrimentally.

Table 74. Recreational facilities used, Gauteng, 2013 (%)

SOURCE: GCRO QoL, 2013

	Libraries	Sports facilities	Botanic gardens/ parks/ open green spaces	World heritage sites	Museums and art galleries
Core	18	19	24	7	9
Periphery	14	15	18	4	6

NOTE: This question was not asked in the GCRO QoL 2015 survey.

“Quality of life can be enhanced by exploring hobbies, watching or participating in sport, visiting parks and botanical gardens and going to art galleries, museums and heritage sites.”



Photograph by Clive Hassall

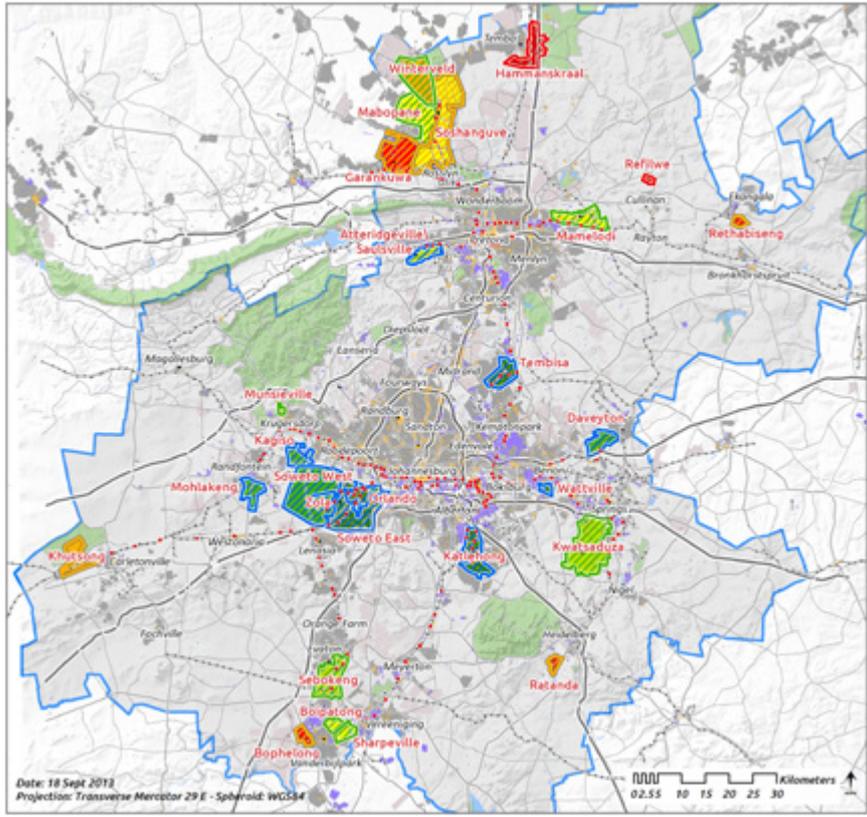
11. Transport and connectivity

Understandings of uneven development emphasise the flows of people and commodities from peripheral areas to core areas (Smith, 1986, 1997; Pileček and Jančák, 2011; Van Hamme and Pion, 2012). As a core area of South Africa, Gauteng certainly receives flows of people and goods. But what happens within the province? What are the flows of people, goods and commodities within it? It is difficult to assess intra-provincial flows of goods. The GCRO Quality of Life 2013 survey provides some information on the flows of people through the province for a variety of purposes. Unfortunately, these questions were not asked in the same level of detail in 2015 as in 2013. However, there is little reason to suppose that the origins and destinations of the journeys of the majority of residents changed dramatically between the two surveys.

Identification of core and peripheral areas is often related to transport. The relationship is complex and at times apparently contradictory. Some scholars identify peripheral areas as those that are distant from, and lack ready transport connections to, the core. Others emphasise the flows of labour, goods and capital, which require transport, from the periphery to the core. Isolation and immobility can act as markers of peripherality while transport networks, distances and directions of movement indicate the relationships between core and peripheral areas and places. Identifiers of peripheral areas also include poor infrastructure (including transport) and lower density road networks. Access to transport and means of transport can also be markers of peripherality.

Figure 43: Gauteng quality of transport: Overall quality of transport

SOURCE: Venter, Mobility in the Gauteng City-Region, 2014



- Residential areas
- Industrial
- Protected areas/
Natural systems
- Waterbodies
- Commercial
- small holdings
- Gauteng Boudary

Existing road network

- Freeway and Primary
- Tertiary
- Metrorail Stations
- Secondary
- Rail network

Overall quality of transport index

- -2.662 - -2.022
- -1.117 - -0.622
- -1.117 - -0.622
- 0.33- 0.770
- -2.021 - -1.118
- -0.621 - -0.353
- -0.061- 0.336

Clusters

- 1. Inaccessible townships
- 2. Poor access, poor mobility townships
- 3: Medium access, mobility advantaged
- 3: Medium access, mobility advantaged

[Figure 43](#) identifies the road and rail transport networks of Gauteng. It shows the lower-density and poorer-quality road networks in peripheral areas of the province. The major road and rail networks reflect understandings of the relationships between core and peripheral areas. The road and rail networks demonstrate the role of Gauteng as the core of the economy of the country as they focus on enabling the flow of resources into the province, and manufactured and other goods out. Within Gauteng, the rail networks are focused on getting resources from resource-producing areas into the core, getting labour and other supplies into the core, and distributing manufactured goods produced in the core around the province and further afield.

The GCRO Quality of Life 2013 survey asked extensive questions about transport, including the origins and destinations of respondents' journeys. People move in large numbers around the province daily (Figure 44). Figures 45 to 47, showing all trips into and within the three metros, highlight the attraction of the core. Those who live in the periphery mostly travel to the core for work. Many residents travel long distances to work, particularly those commuting from peripheral areas to the core (Figures 48 to 58). However, there are also residents in the periphery who travel to work nodes in peripheral areas, and, in the case of Emfuleni,

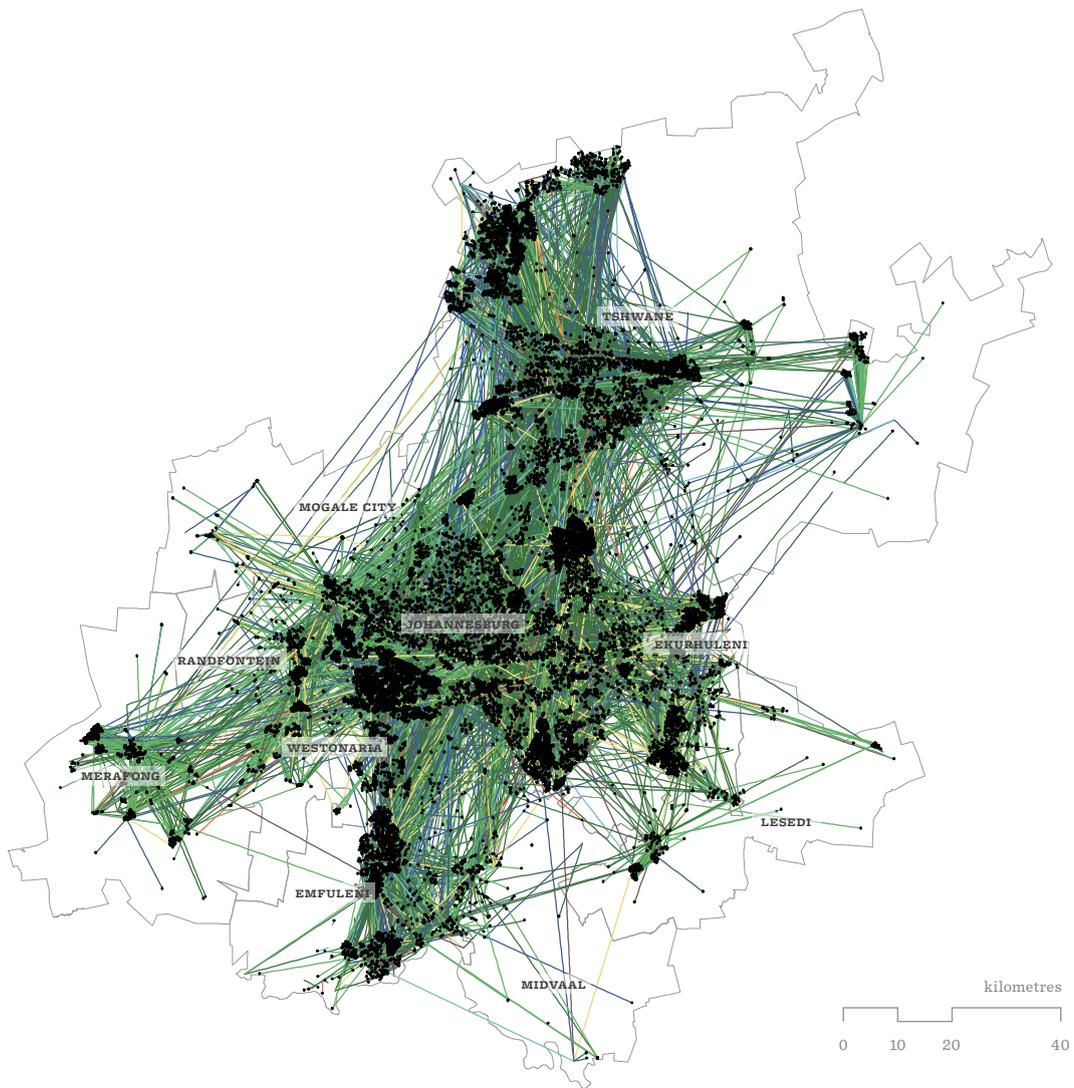
to core areas located in the municipality (Figures 52 to 58). Residents of the core who live in metros may travel outside the boundaries of the metro in which they live to go to work, but usually to another core area, with few commuting to peripheral areas (Figures 49 to 51).

People from peripheral areas mainly look to the core for job opportunities, although the mining areas of Merafong and Randfontein attract interest (Figure 59). People are less likely to travel long distances for leisure and entertainment, and most head to venues in the core. Some travel relatively long distances for these purposes and some people from the core venture to peripheral areas (Figure 60). Shopping opportunities appear to be more likely to be located in core areas (Figures 61 to 64). However, people in peripheral areas seem as likely to shop locally as go to core areas (Figure 61).

Although the mapping of all trips shows a strong orientation to the core, the picture is a little more complex. Figures 52 to 58, showing commutes, and Figure 61, showing journeys for shopping, reveal the presence of smaller-scale core places. So, although towns like Westonaria, Bronkhorstspuit and Babelegi are located in peripheral areas, and are relatively small conurbations, they may be core for the people living in and around them in terms of work, recreation and consumption.

Figure 44: All trips undertaken (commutes, looking for work, leisure), 2013

SOURCE: GCRO QoL, 2013



Reason for, and origin of trip

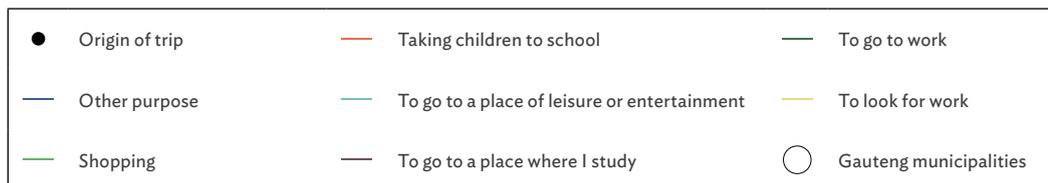


Figure 45: All trips into and within the City of Johannesburg, 2013

SOURCE: GCRO QoL, 2013



Figure 46: All trips into and within the City of Tshwane, 2013

SOURCE: GCRO QoL, 2013

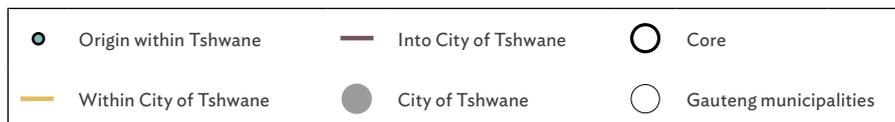


Figure 47: All trips into and within Ekurhuleni, 2013

SOURCE: GCRO QoL, 2013

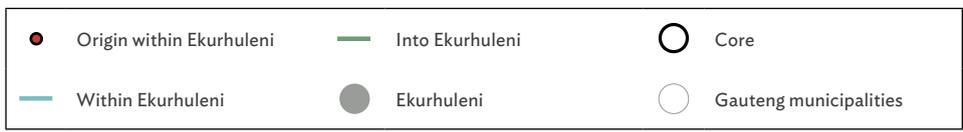
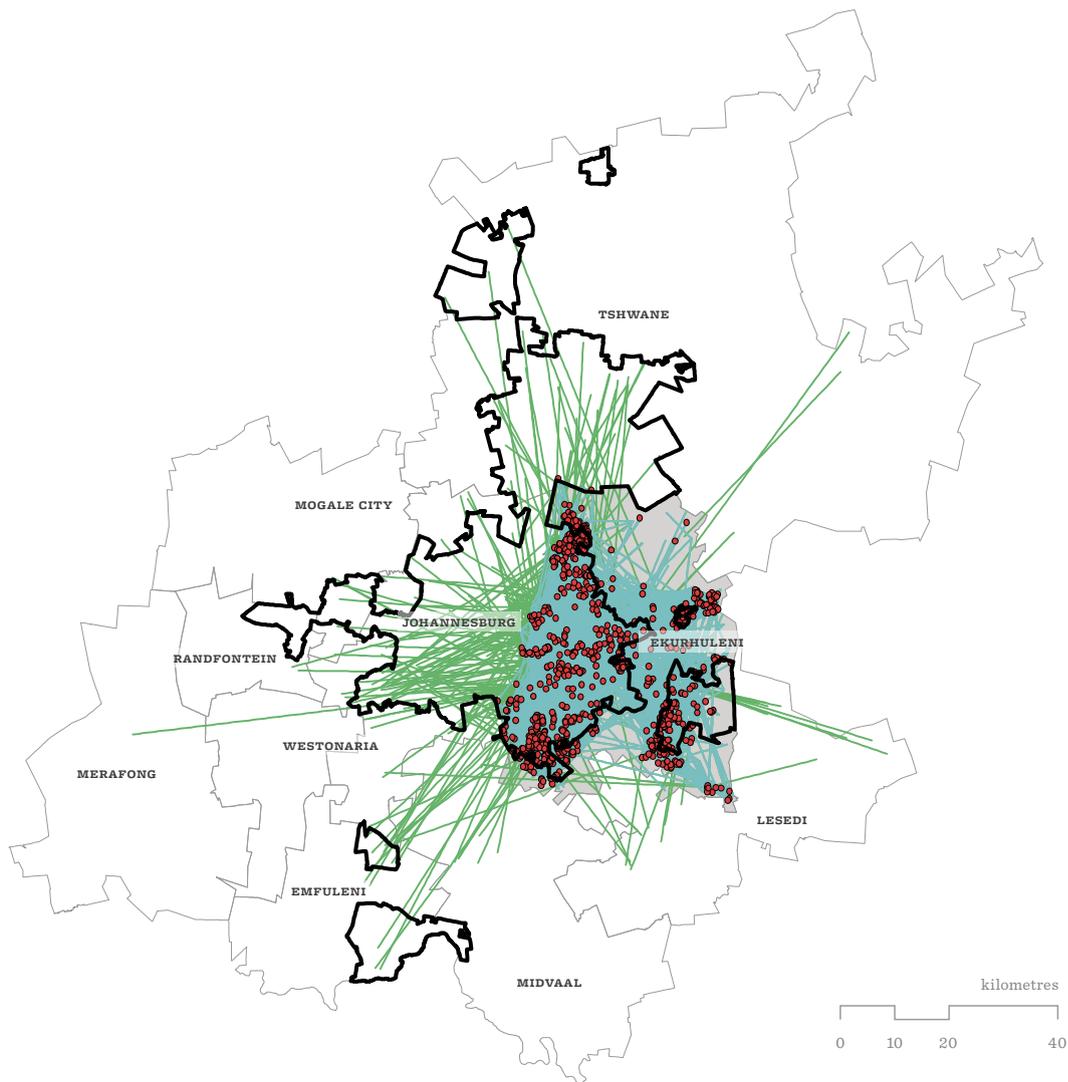


Figure 48: All commuting trips except the City of Johannesburg, 2013

SOURCE: GCRO QoL, 2013

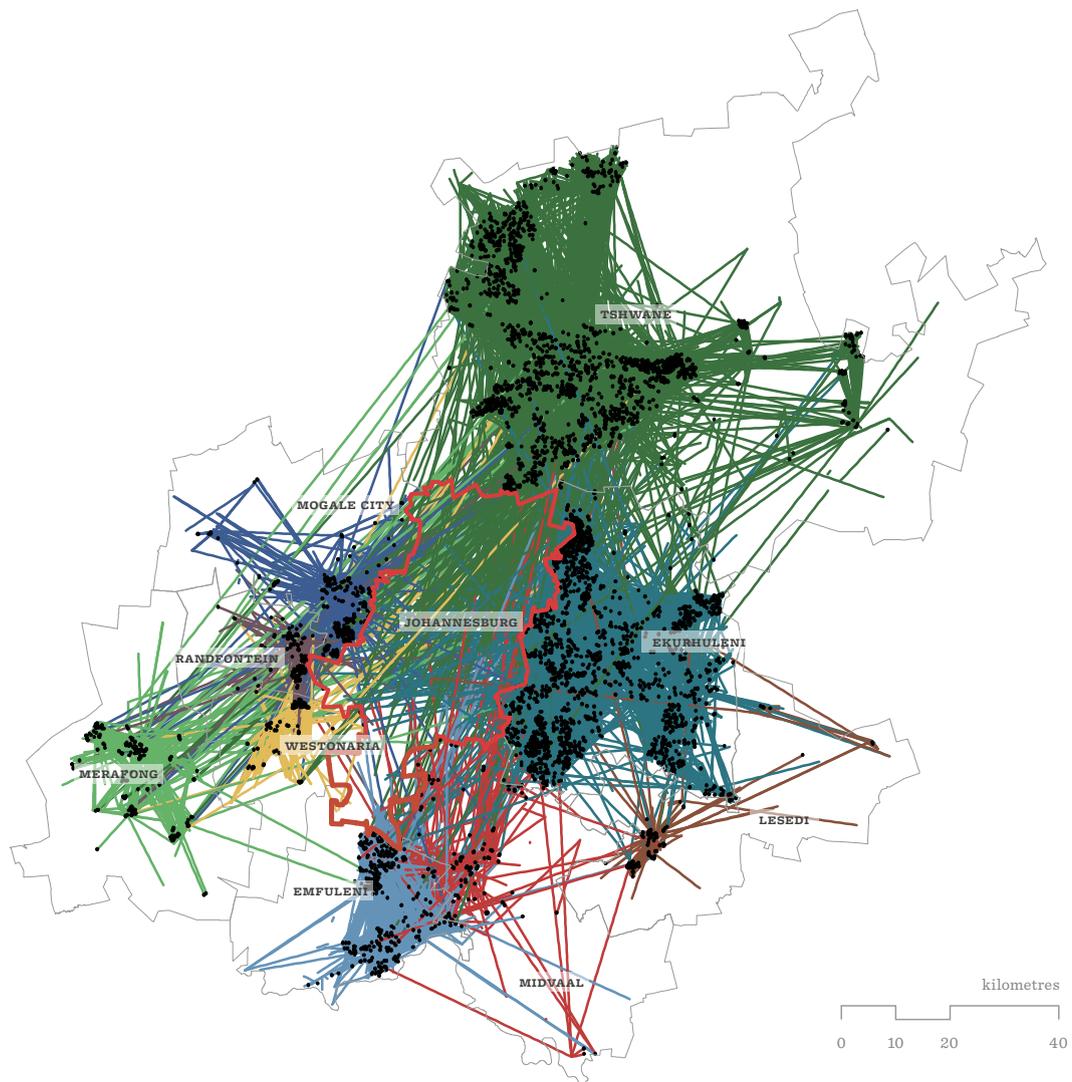


Figure 49: Commuter trips within and from the City of Johannesburg, 2013

SOURCE: GCRO QoL, 2013



Figure 50: Commuter trips within and from Ekurhuleni, 2013

SOURCE: GCRO QoL, 2013

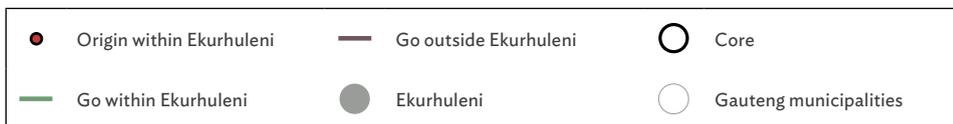
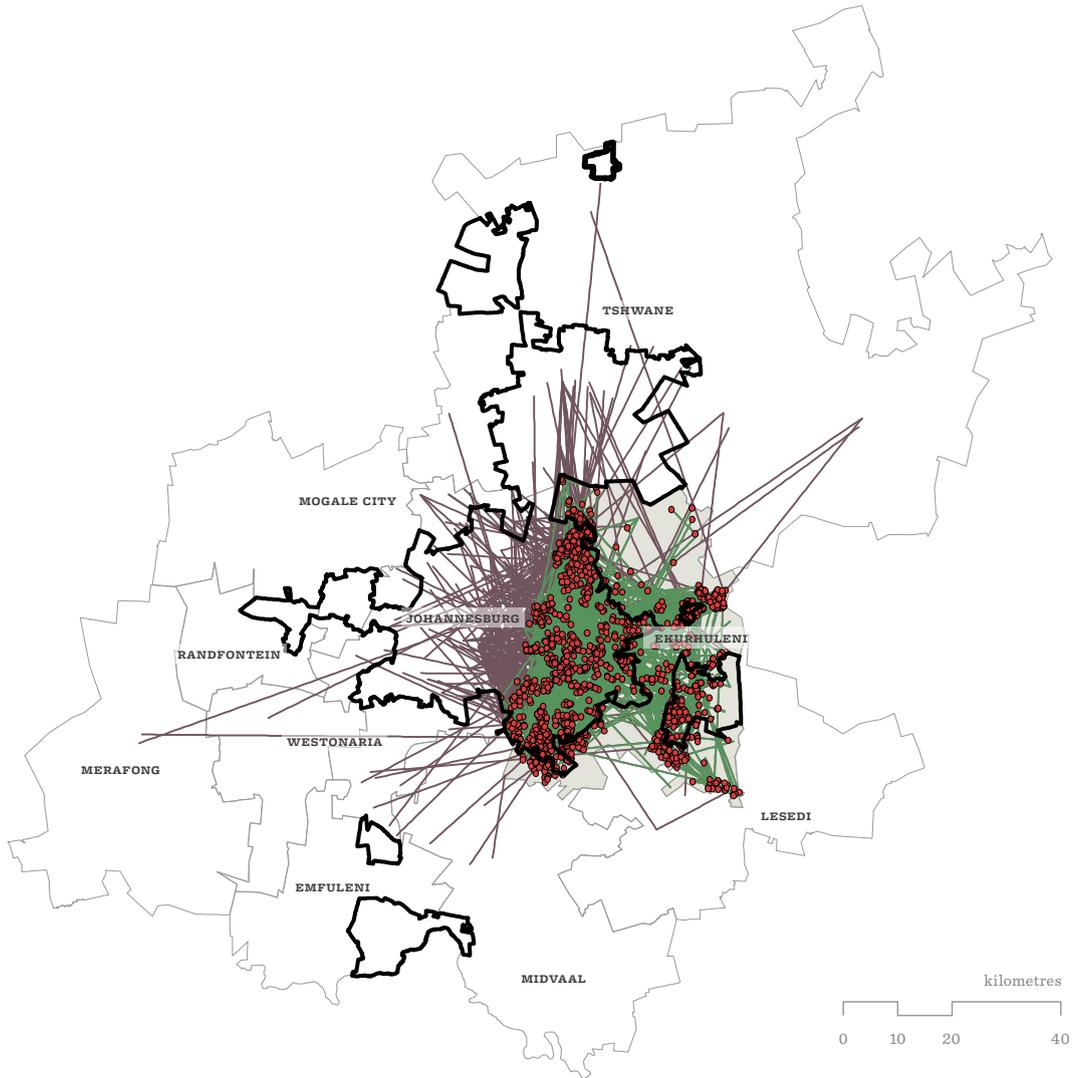


Figure 51: Commuter trips within and from the City of Tshwane, 2013

SOURCE: GCRO QoL, 2013

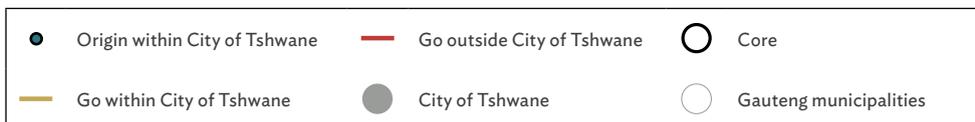
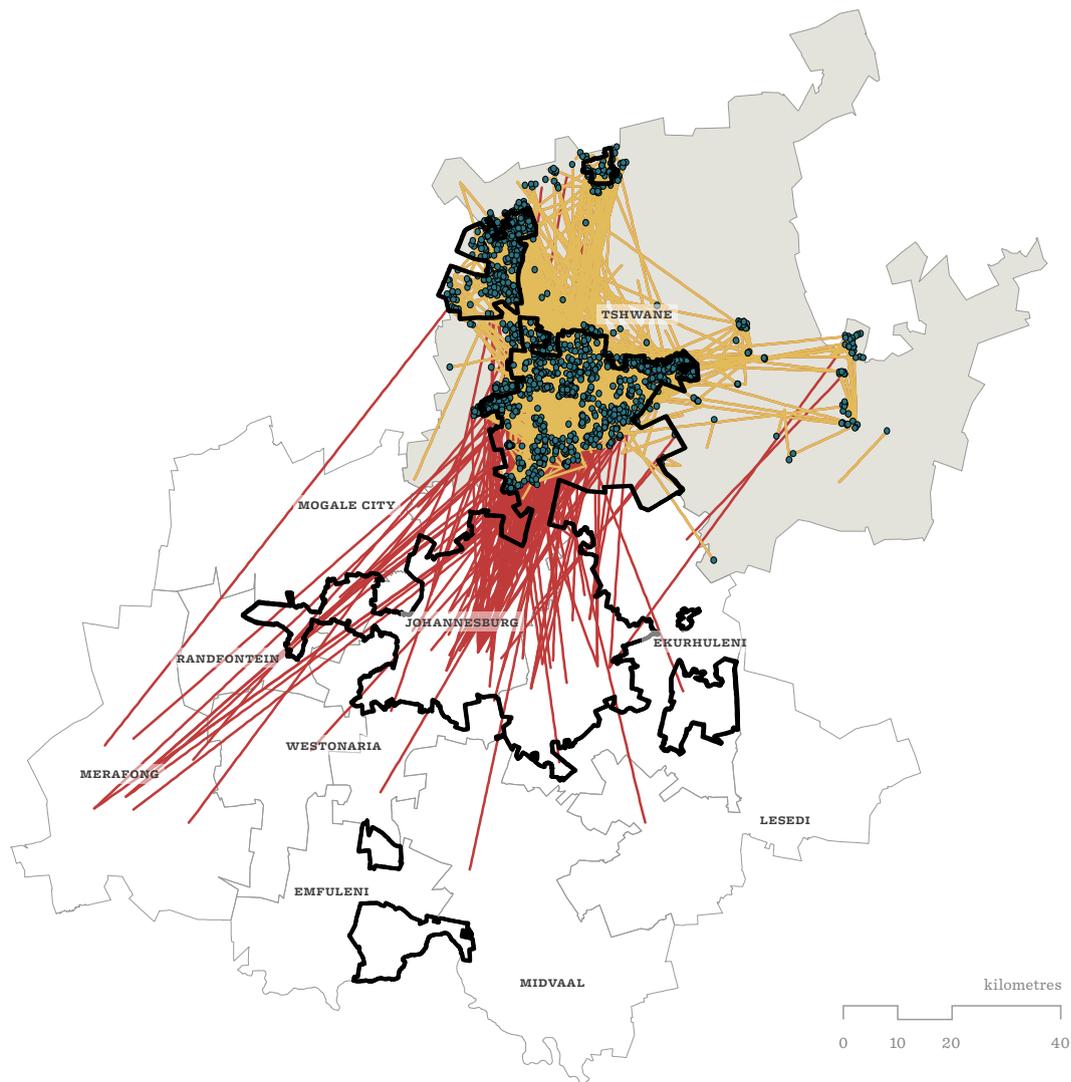


Figure 52: Commuter trips within and from Emfuleni, 2013

SOURCE: GCRO QoL, 2013

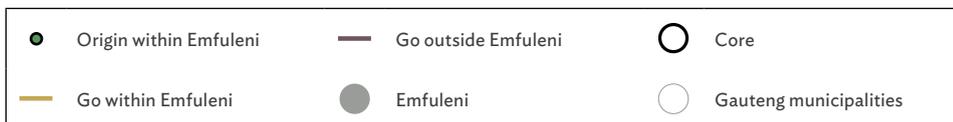


Figure 53: Commuter trips within and from Lesedi, 2013

SOURCE: GCRO QoL, 2013

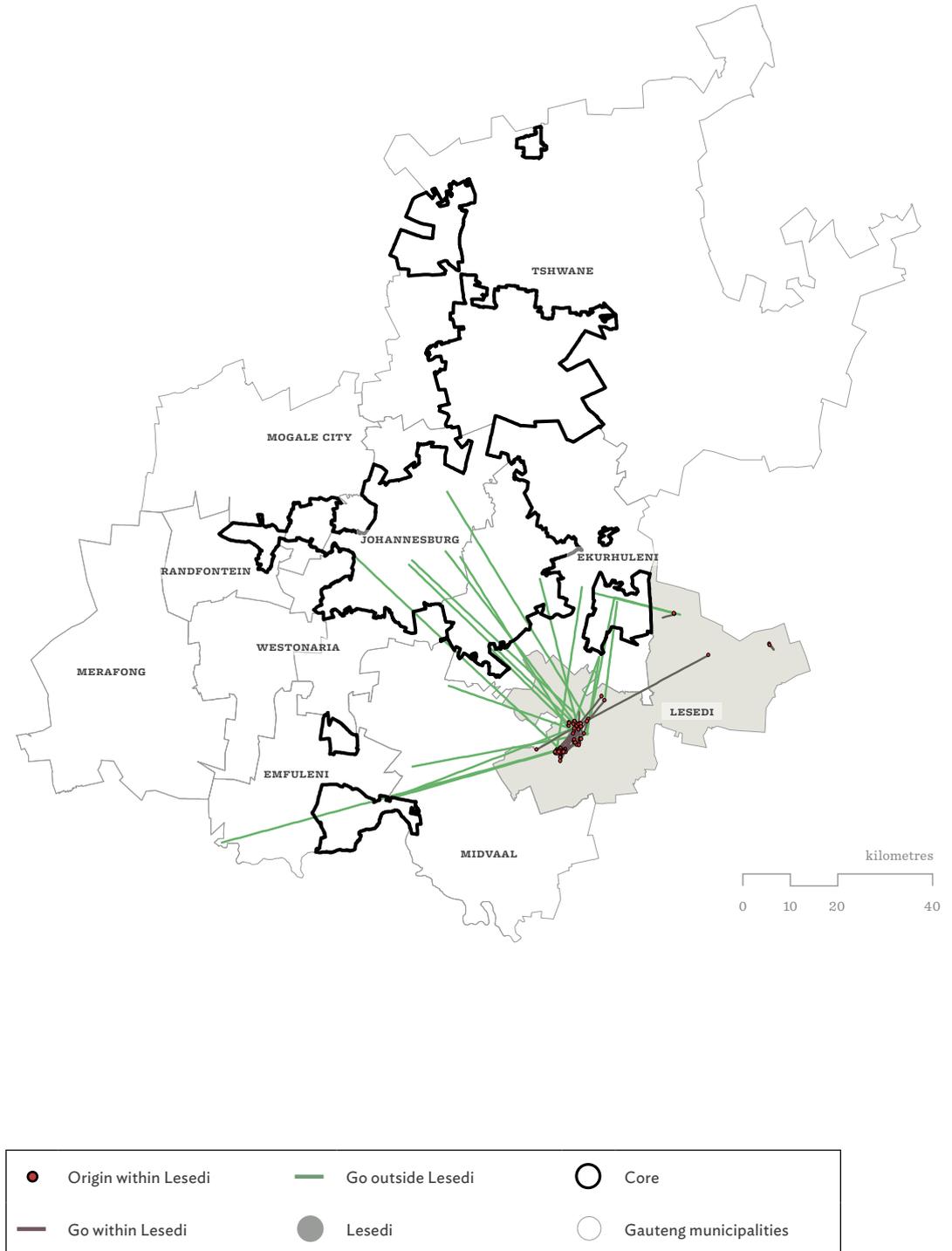


Figure 54: Commuter trips within and from Merafong, 2013

SOURCE: GCRO QoL, 2013

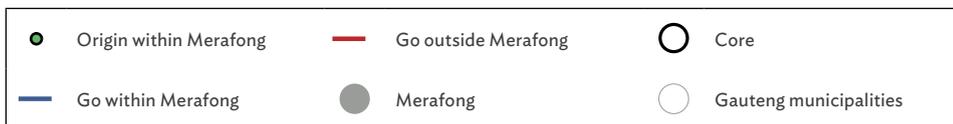


Figure 55: Commuter trips within and from Midvaal, 2013

SOURCE: GCRO QoL, 2013

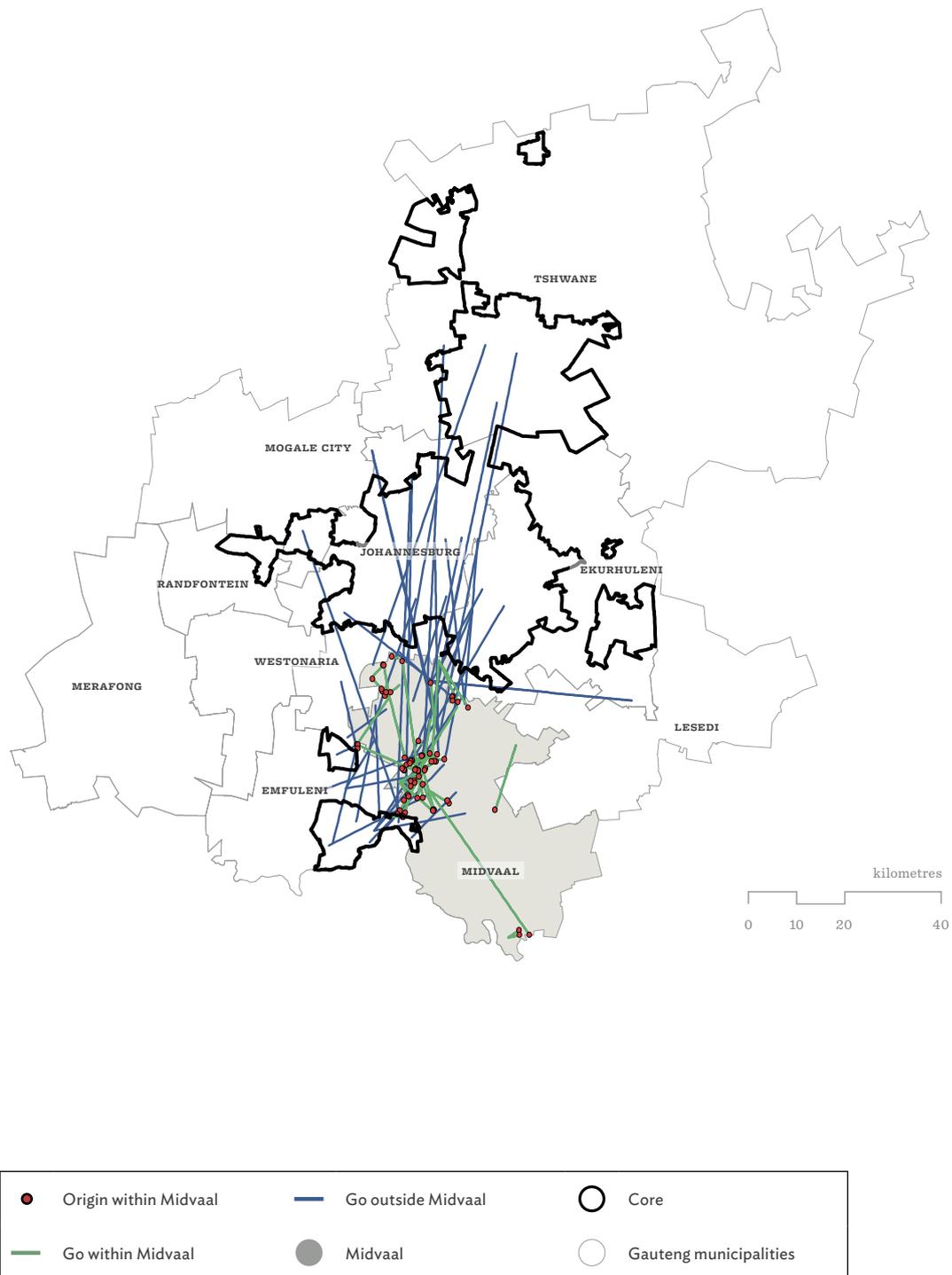


Figure 56: Commuter trips within and from Mogale City, 2013

SOURCE: GCRO QoL, 2013

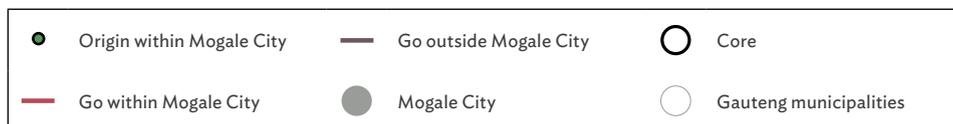
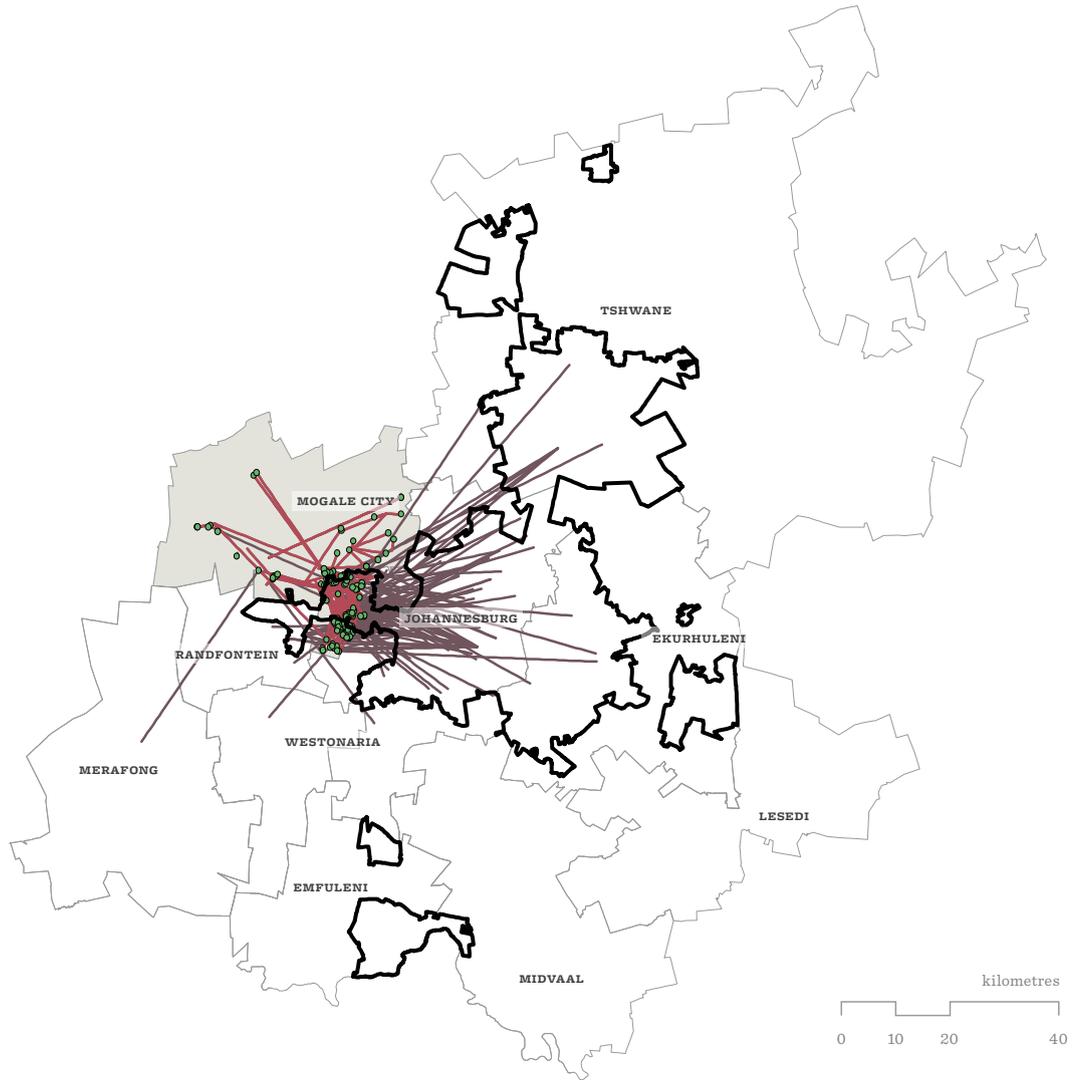


Figure 57: Commuter trips within and from Randfontein, 2013

SOURCE: GCRO QoL, 2013



Figure 58: Commuter trips within and from Westonaria, 2013

SOURCE: GCRO QoL, 2013

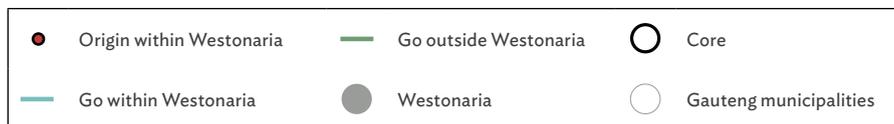
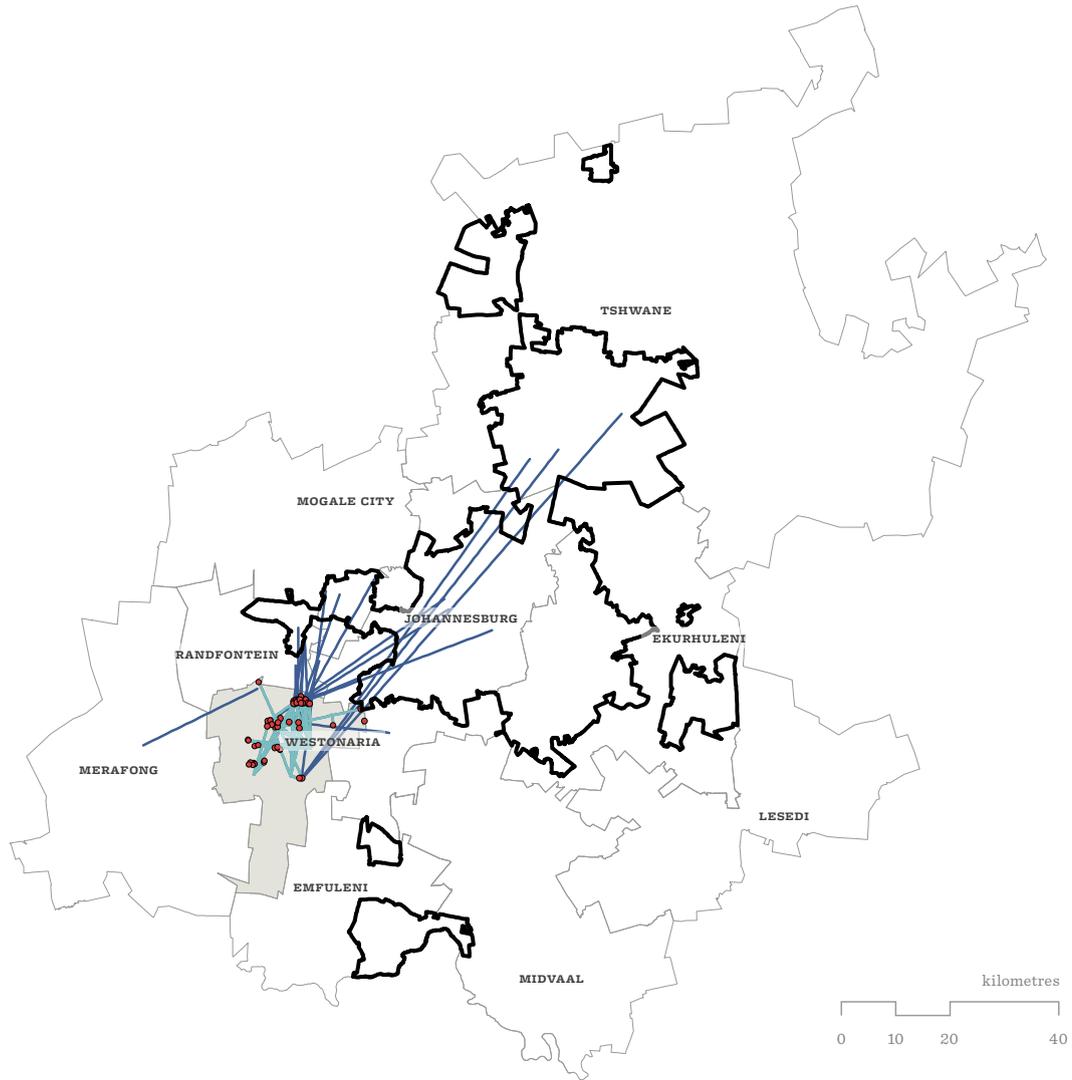


Figure 59: Trips to look for work from all municipalities, 2013

SOURCE: GCRO QoL, 2013

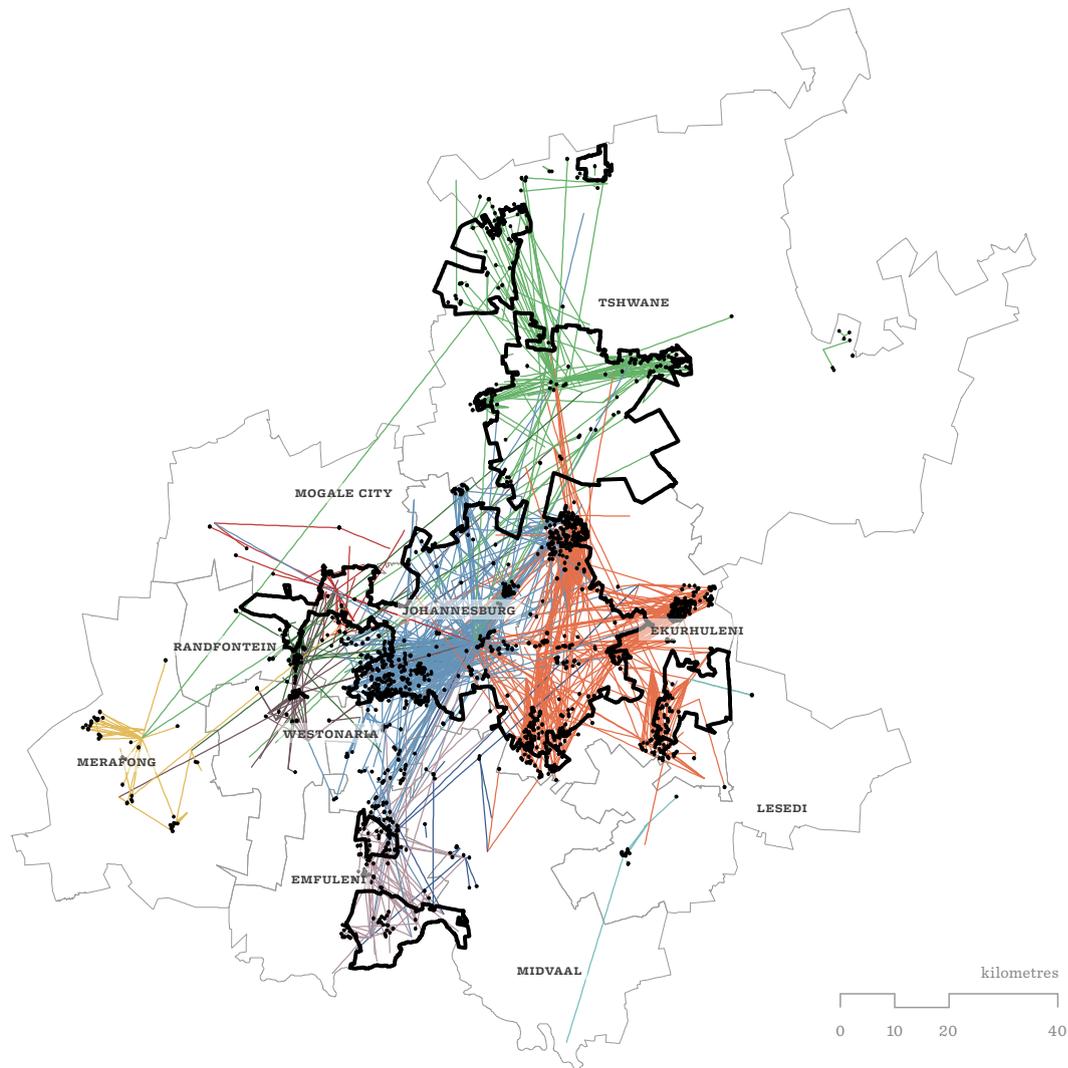


Figure 60: Trips for leisure and entertainment from all municipalities, 2013

SOURCE: GCRO QoL, 2013

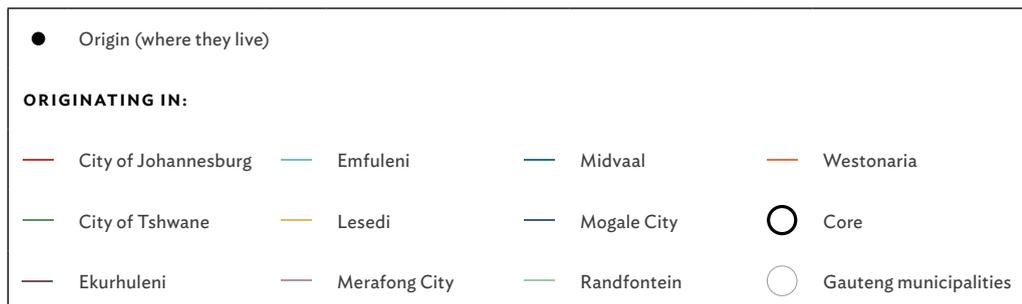
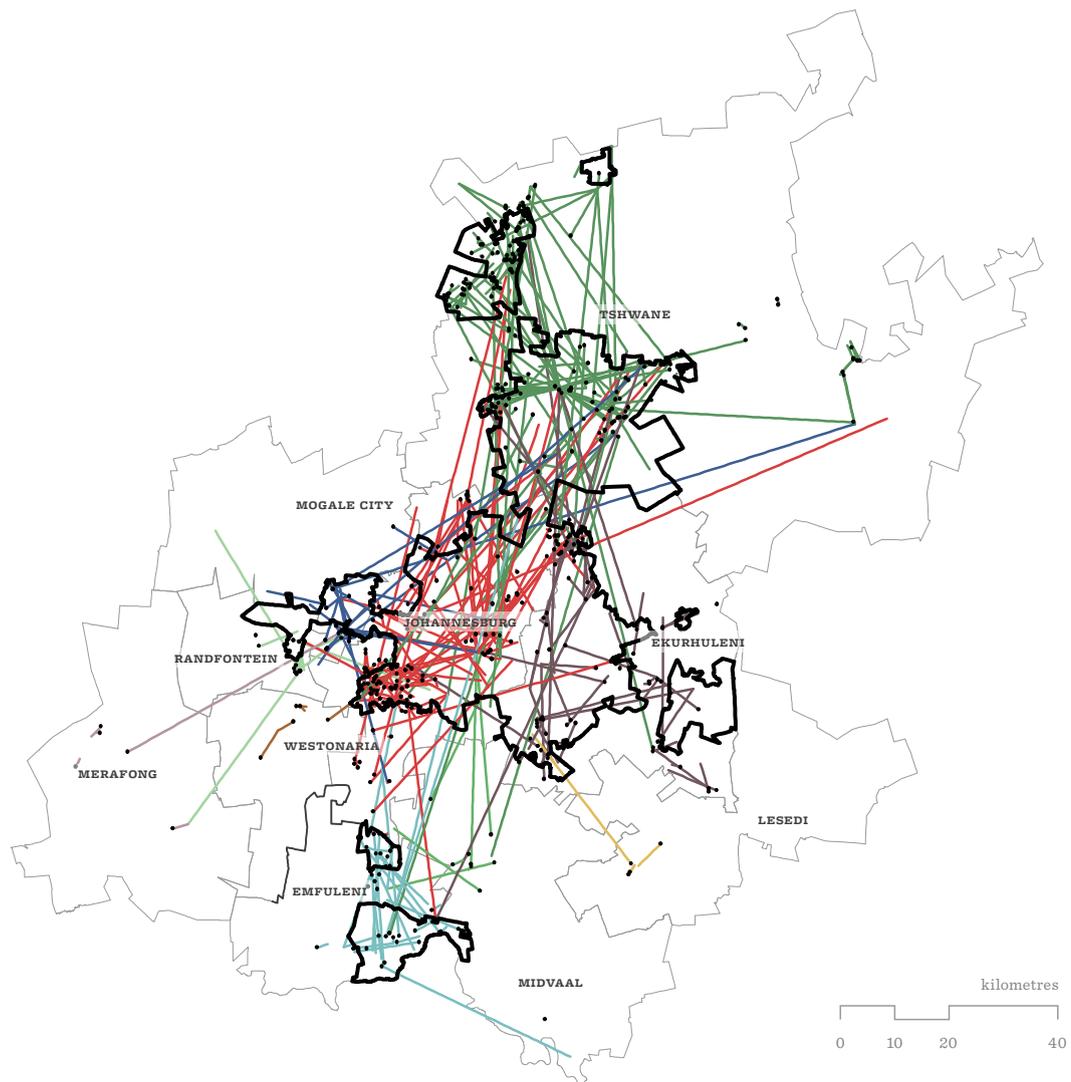


Figure 61: Trips for shopping, all municipalities except Johannesburg, 2013

SOURCE: GCRO QoL, 2013

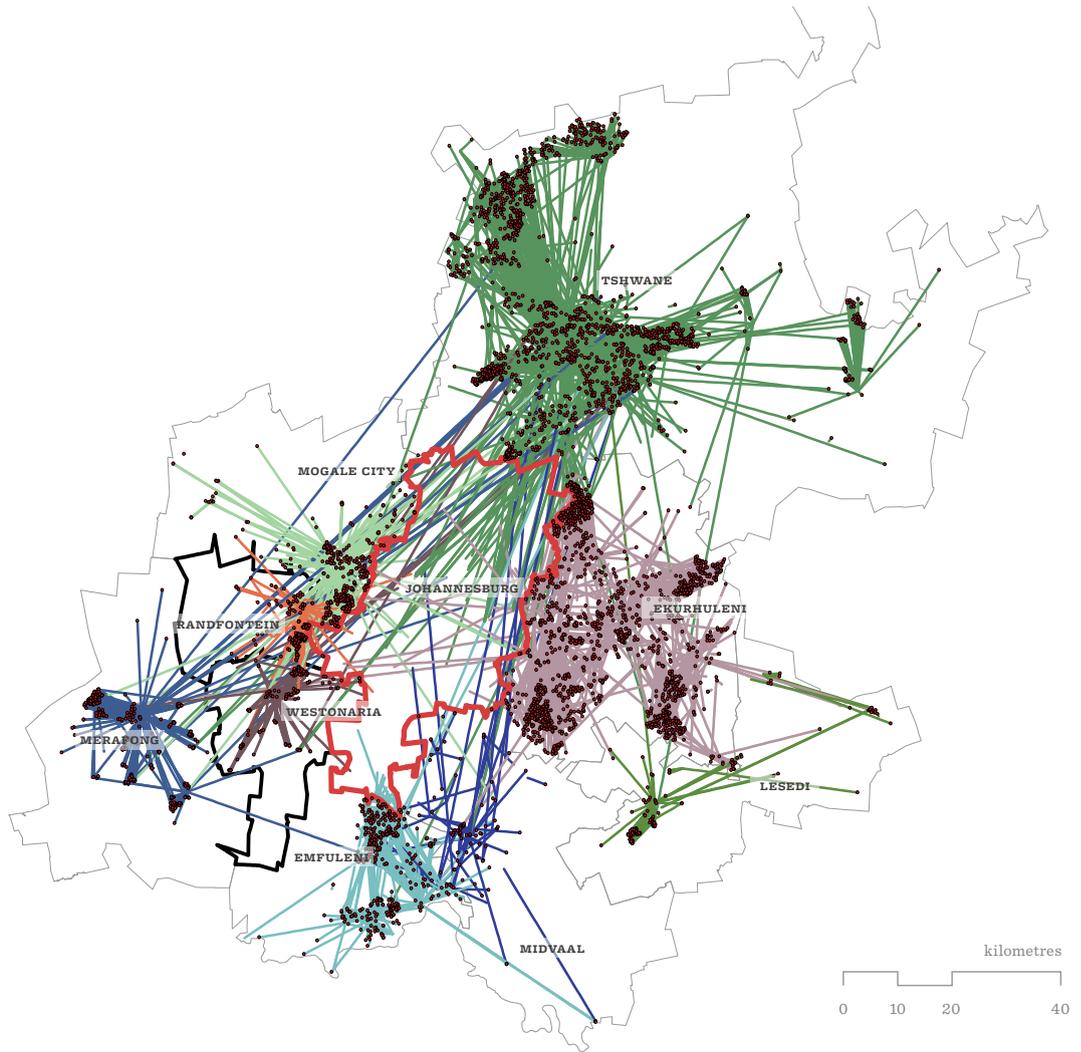


Figure 62: Trips for shopping, City of Johannesburg, 2013

SOURCE: GCRO QoL, 2013

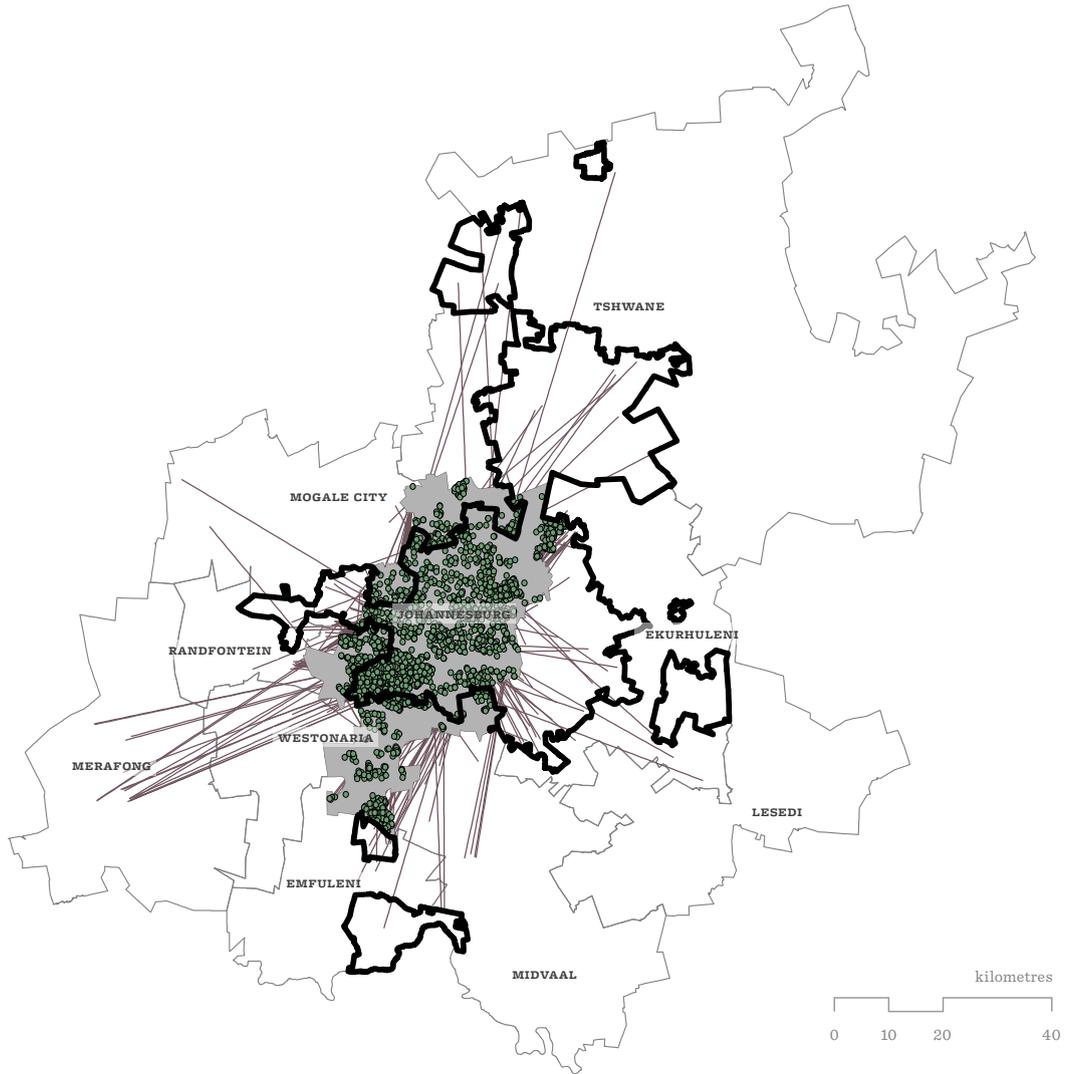


Figure 63: Trips for shopping, City of Tshwane residents, 2013

SOURCE: GCRO QoL, 2013

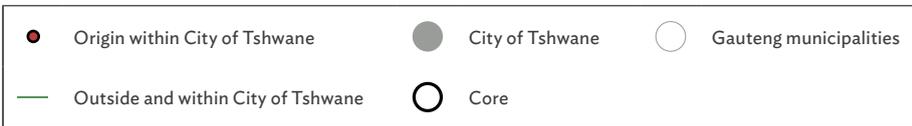
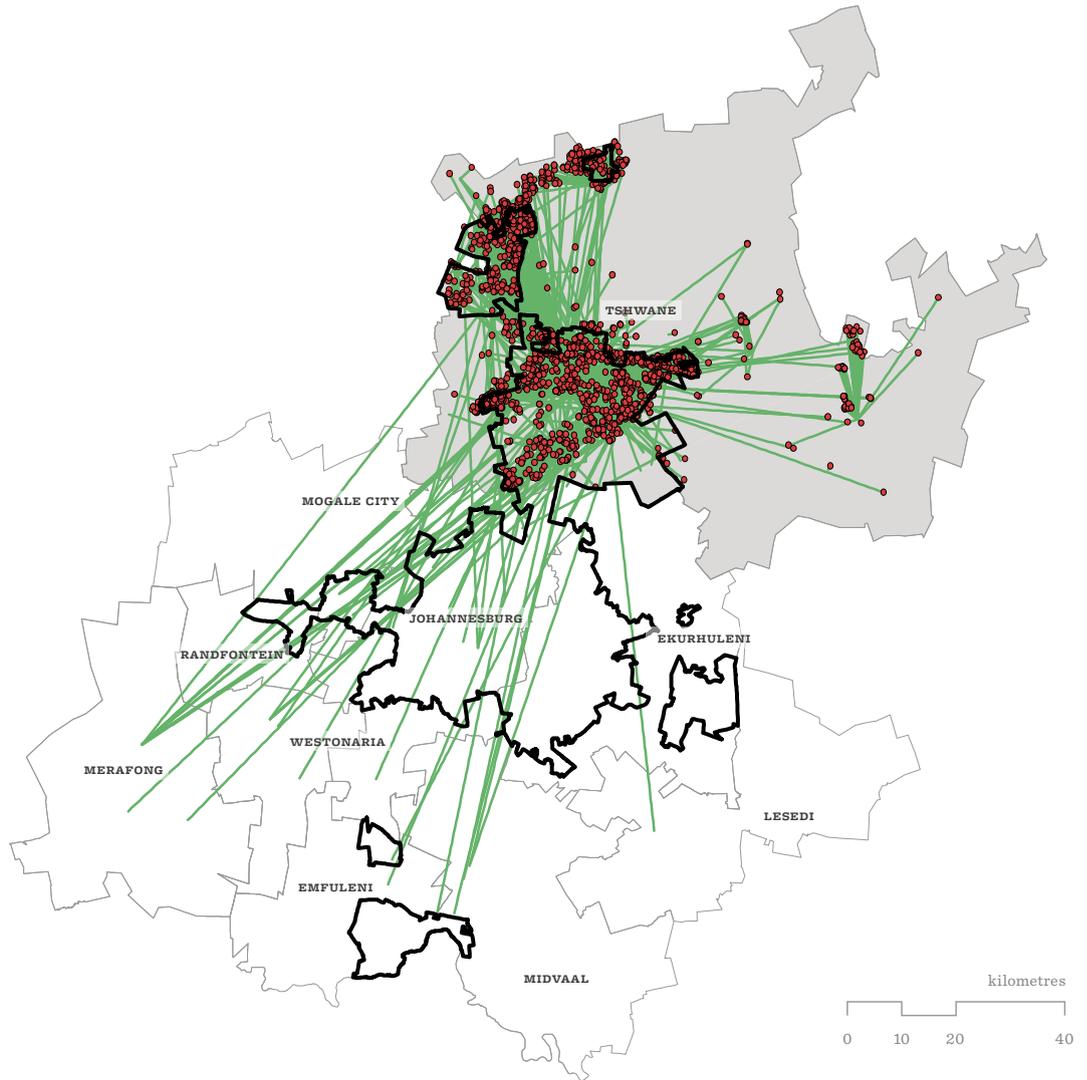
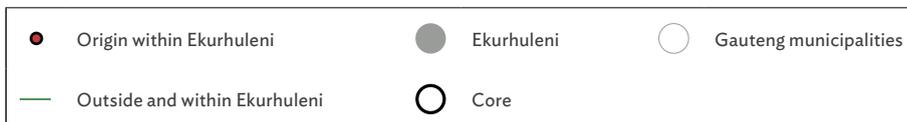
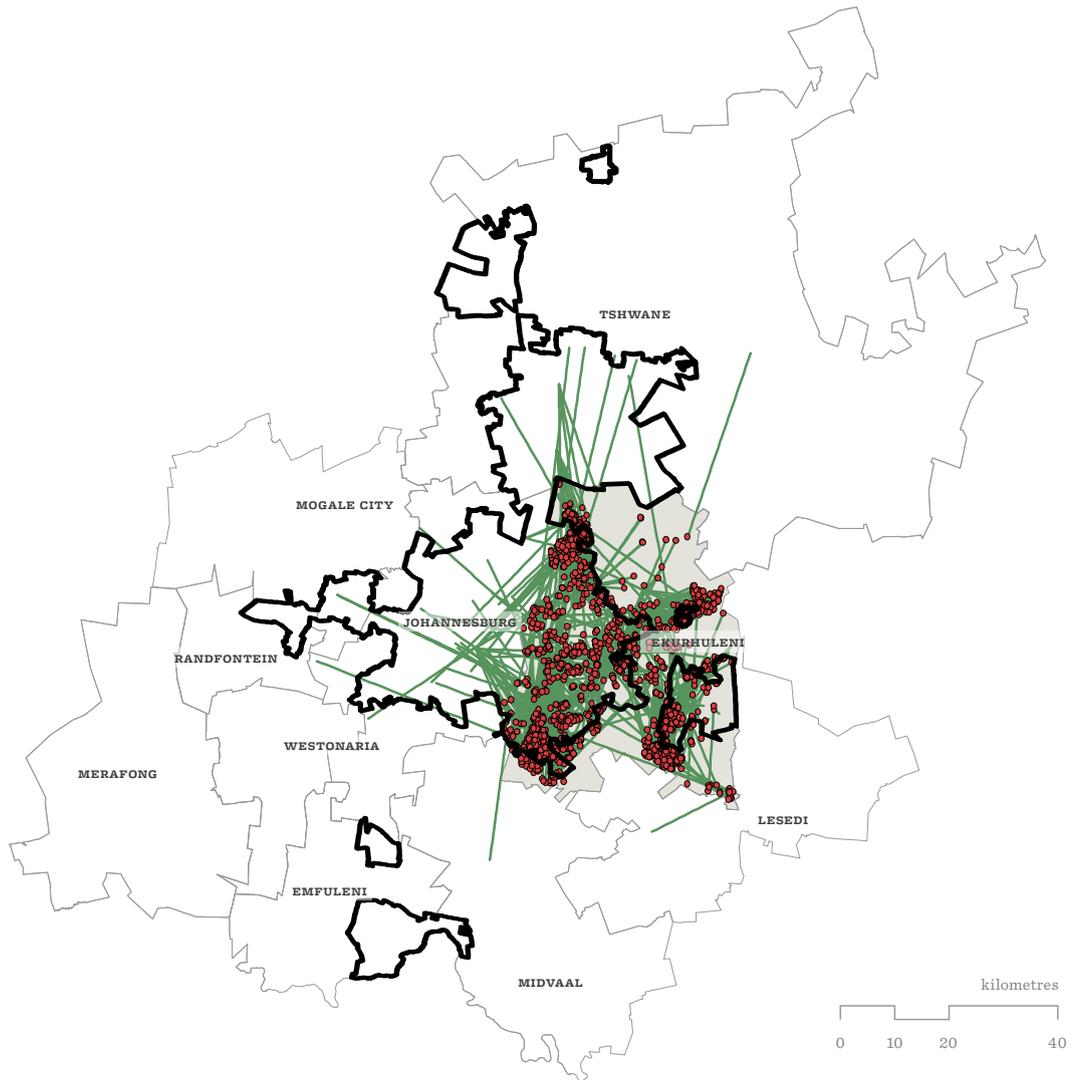


Figure 64: Trips for shopping, Ekurhuleni residents, 2013

SOURCE: GCRO QoL, 2013





Photograph by Skhumbuzo Mtshali

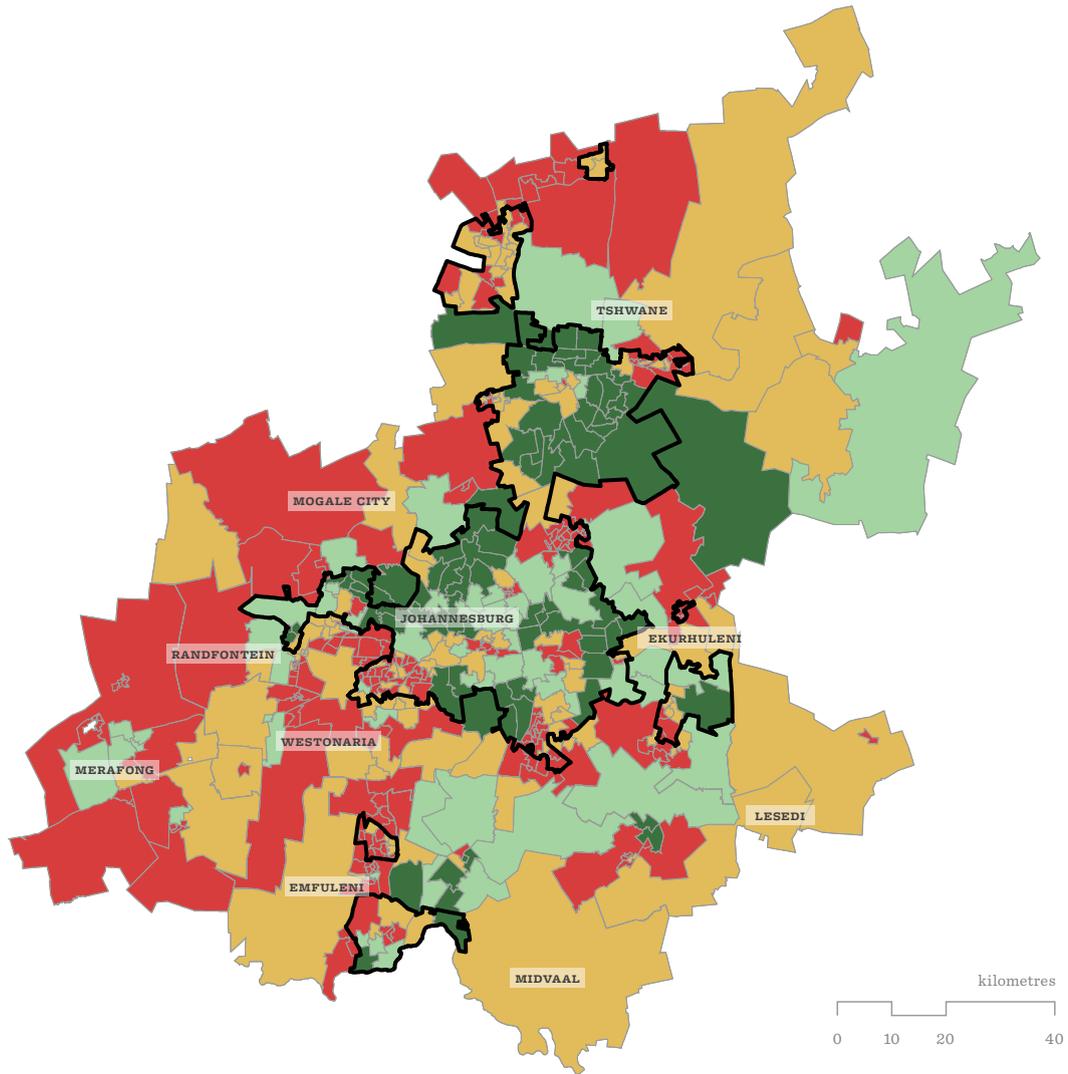
11.1 Access to transport

In terms of access to and use of transport, the majority of households in the province rely on public transport to get around, or they walk. In 2011, less than a third of households (30 per cent) in peripheral areas owned a car, compared to 42 per cent in the core (Census,

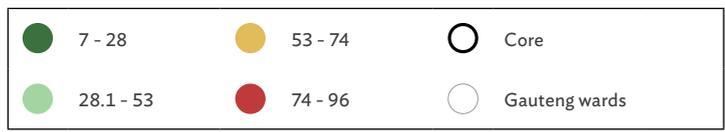
2011). The periphery was home to most of the wards with the lowest car ownership (Figure 65). This means that most residents rely on public transport, or car owners not in their own household, to travel around the province.

Figure 65: Households with no car per ward (%)

SOURCE: Census, 2011



Households with no car per ward (%)



The GCRO Quality of Life 2015 survey found that over half of residents in the core (59 per cent), and 67 per cent in the periphery, used public transport for their most frequent trips (Table 75). Taxis were the most common form of transport used. Trains and buses came a distant second and third, as public transport carriers. Notably, the proportion of residents using the new bus rapid-transport systems of ReaVaya (Johannesburg), and A re yeng (Pretoria), was slightly larger than those using older bus carriers (Table 75). Overall, around a third of residents thought that public transport services had improved for them and their households in the previous year (GCRO QoL, 2015). Cars were used by 44 per cent of residents (as

drivers, passengers or as part of a lift club) in the core, and less than a third (31 per cent) in the periphery, for their longest and most frequent trips (Table 75). In December 2013, highly-contested open road tolls (e-Tolls) were introduced in Gauteng. They had an impact on residents in the province, with 16 per cent in the core, and 11 per cent in the periphery, saying the introduction of tolls had caused them to change their route. A slightly lower proportion said tolls had caused them to change their mode of transport (12 per cent in the core, and 9 per cent in the periphery). The slightly lower proportion of residents in the periphery who had changed their routes and mode of transport possibly reflects lower levels of car use.

Table 75: Types of transport used for most frequent and longest trips, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Walk	Taxi	Train	Gautrain	ReaVaya or A re yeng bus	Other bus	Car as driver	Car as passenger or lift club
Core	64	46	7	1	3	2	32	12
Periphery	74	57	5	0.4	2	2	21	10

NOTE: Multiple response question.

Access to nearby transport services was relatively similar, with two thirds in the core, and 63 per cent in the periphery, reporting that they had transport services within walking distance of their homes (GCRO QoL, 2015). The majority of residents were satisfied with the mode of transport they used, but

people in the periphery were less likely to be so (Table 76). Some residents were dissatisfied with the condition of roads, particularly those in the periphery (Table 76). This suggests that transport infrastructure in peripheral areas is not being maintained and/or upgraded.

Table 76: Satisfaction with mode of transport and roads, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Very satisfied	Satisfied	Neither	Dissatisfied	Very dissatisfied
Satisfaction with mode of transport used for longest and most frequent trips					
Core	21	59	9	9	2
Periphery	14	61	9	12	4
Satisfaction with roads					
Core	21	41	10	14	14
Periphery	12	34	9	20	26

The GCRO Quality of Life 2013 survey data on transport shows that core areas of the province attract commuters and those looking for work from the periphery and core. However, there is also evidence, particularly when it comes to shopping, but also in the arena of work, of the existence of smaller cores or nodes in peripheral areas of the province. For some residents, whether they are excluded from the core, they exclude themselves, or they are disengaged from the core, these nodes constitute their world. However, the overwhelming impression reflects the relationship between core and periphery described in the literature on uneven development, with peripheral areas providing low-cost labour for the core.

11.2 Connectivity

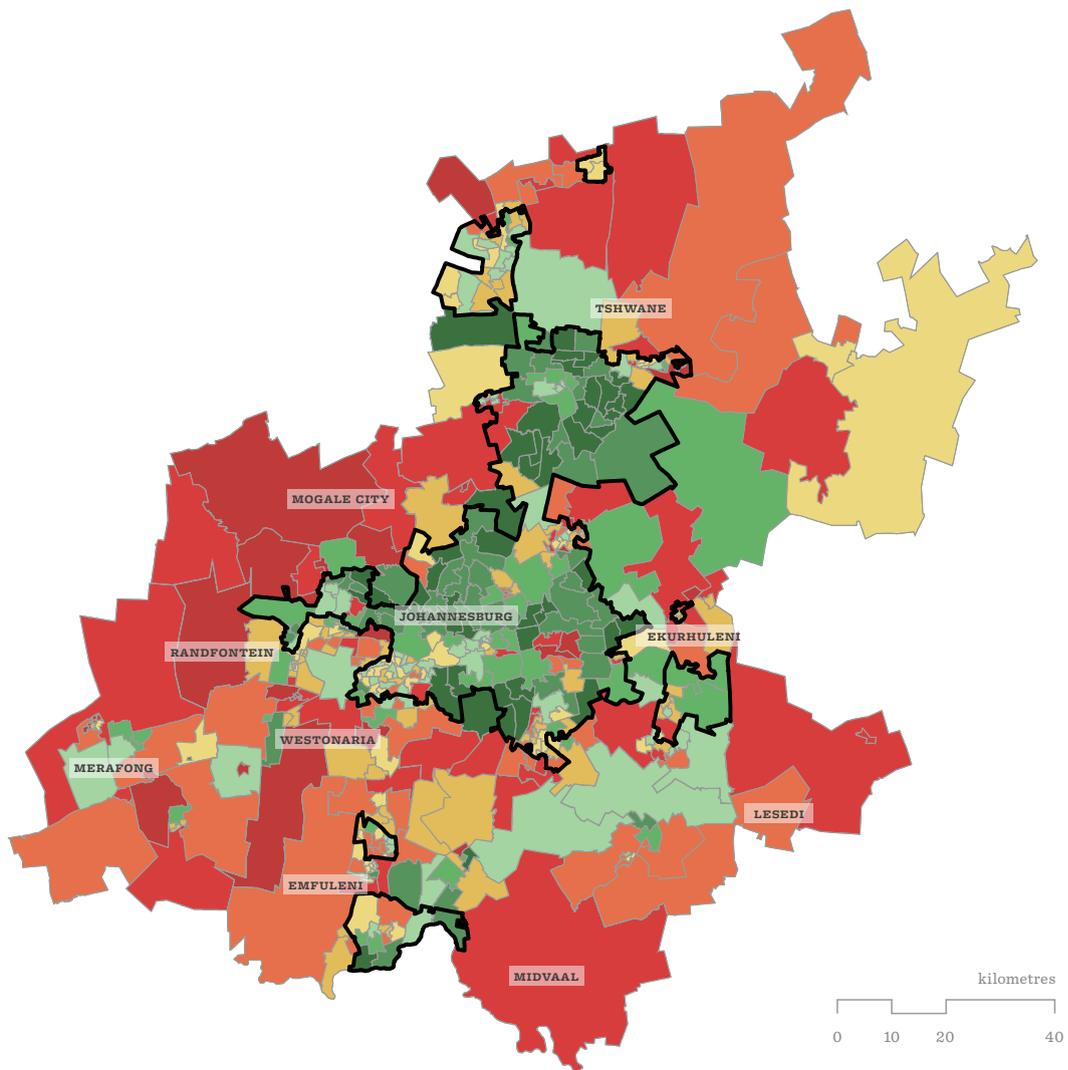
Peripheral areas are marked by their lack of connectivity and the difficulties residents have in accessing services, information, employment and core areas. Connectivity extends beyond transport. Using data from Census 2011, this study developed an

index of connectivity which includes the percentage of households per ward without a car, and with no access to a computer, the internet, radio and television (Figure 66). Having access to a computer, the internet, radio and television enhances access to work and leisure opportunities and information. Owning a car may not be essential, but having access to a good, affordable public transport system is. Access to cell and landline phones was not included in the index, given that by 2011, 95 per cent of households in the province had access to a cell phone (Census, 2011).

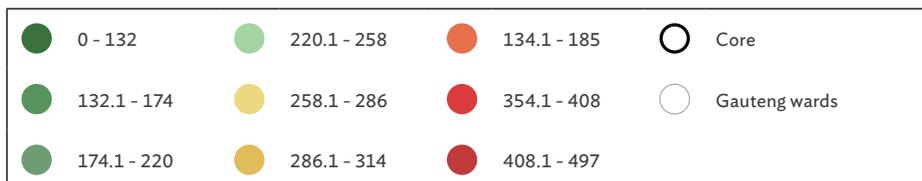
Households and residents in peripheral areas are proportionately more likely to have low and lower levels of connectivity than residents of core areas (Figure 66). However, there are areas within the core of the province where residents have low levels of connectivity. On the whole, these are associated with former apartheid black townships and informal settlements where people have low incomes.

Figure 66: Connectivity index

SOURCE: Census, 2011



Connectivity index



“Municipalities increasingly encourage residents to receive bills electronically, whether by cell phone or email, and to pay municipal accounts by means of electronic bank transfers.”

Access to a car may be important for residents who have to travel long distances to work, or do shift work, particularly where public transport is irregular and/or not available at night. Public transport networks in the province are incomplete, and many residents rely on mini-bus taxis which, although they are provided through the private sector, are regulated by the state. According to Census 2011 data, less than a third of households (30 per cent) in peripheral areas owned a car, compared to 42 per cent in core areas. The GCRO Quality of Life 2015 survey found no difference in either area in the proportion of households owning a car. It is in peripheral areas, where the highest proportions of residents who have to travel the longest distances, where public transport networks may be weak, are where the highest proportions of people without a car, per ward, are found.

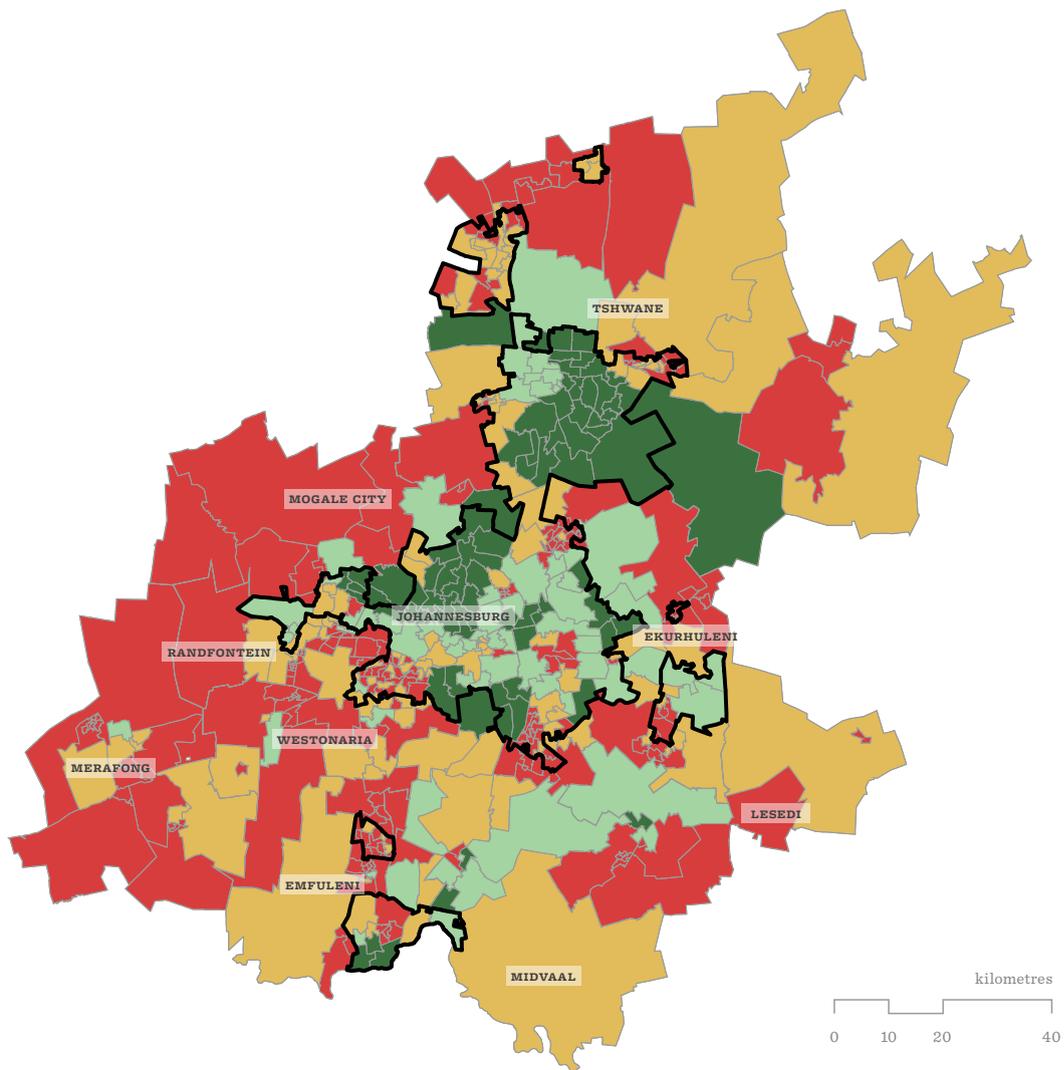
Municipalities increasingly encourage residents to receive bills electronically, whether by cell phone or email, and to pay municipal accounts by means of electronic bank transfers. The proliferation of cell phones as well as cell phone and internet banking makes this possible for some residents. However, these systems transfer the costs of receiving and paying bills from local authorities to the customer, and the proportional cost of receiving and paying bills for low-income residents is high. Nevertheless, electronic systems increase direct access to billing

and municipal information for many households as most residents do not have access to postal services. Census 2011 found that only a third of households in the core, and 22 per cent in the periphery, received mail through a mail box and only 15 per cent in the core and 14 per cent in the periphery had mail delivered to their doorstep.

Access to a computer and the internet whether at home, school or work, is increasingly important as residents need to (and are often required to) access information, do banking and pay bills using electronic services. Households in peripheral areas are least likely to have access to a computer, and are more likely to be at a distance from municipal offices and postal services so that accessing physical pay points may be difficult. However, there is a low penetration of computer ownership in the province generally, as significant numbers of households in the core have no access to computers at home (Figure 67). Census 2011 found that just over a third (36 per cent) of households in core areas have a computer at home, compared to just over one in five (22 per cent) households in peripheral areas. The GCRO Quality of Life 2015 survey found that the proportion of households with a computer at home had changed little in the intervening years, with 39 per cent of residents in the core, and 25 per cent in the periphery, having access to a computer at home.

Figure 67: Households with no computer at home per ward (%)

SOURCE: Census, 2011



Households with no computer at home per ward (%)

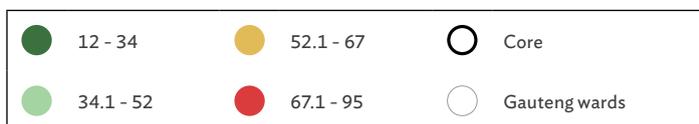
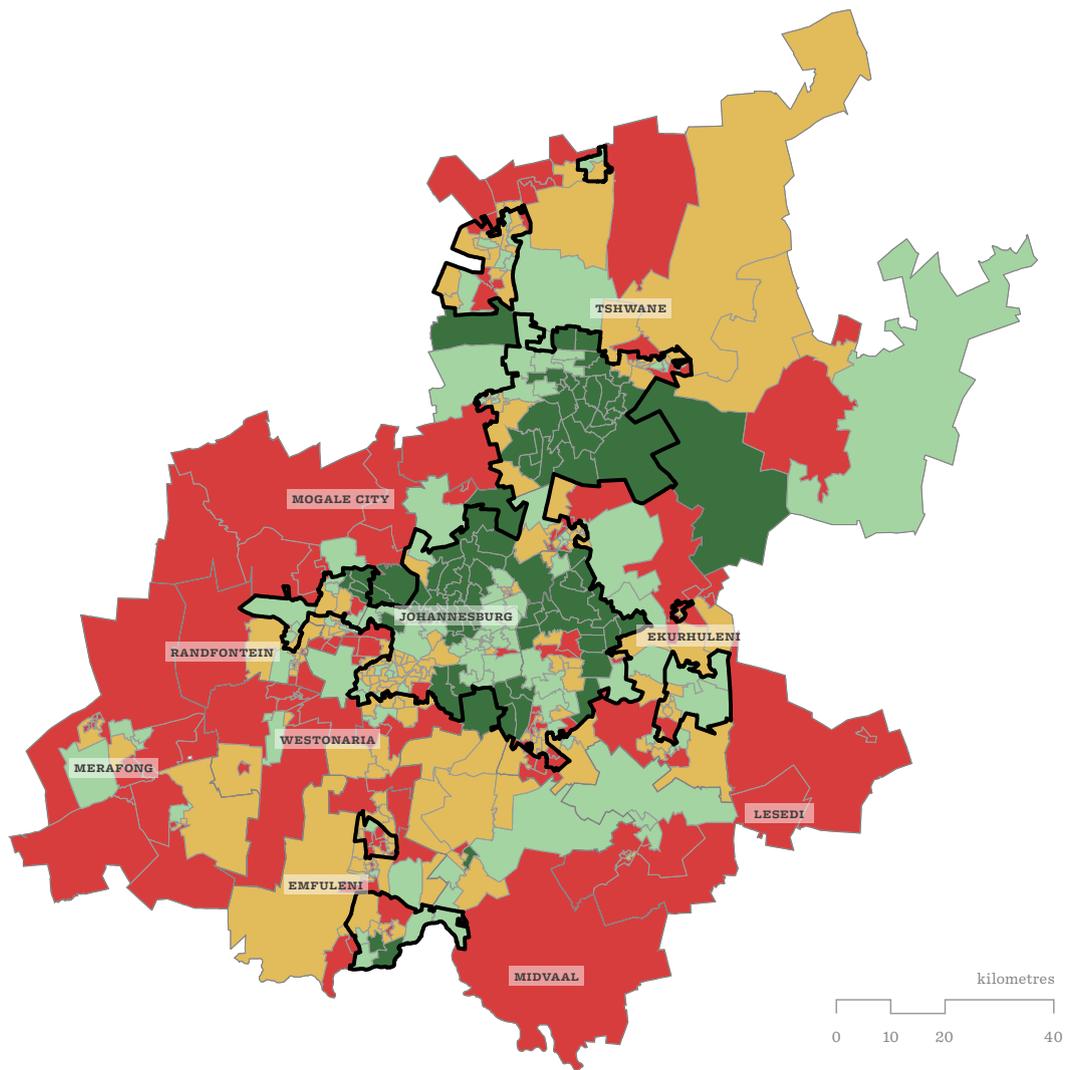


Figure 68: Households with no access to the internet per ward (%)

SOURCE: Census, 2011



Households with no access to the internet per ward (%)

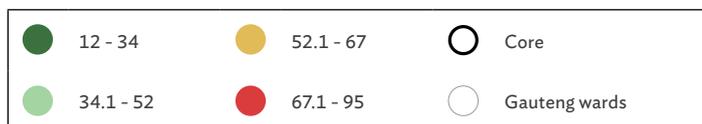


Figure 68 shows the proportion of households per ward in 2011 with no access to the internet whether on a phone, at home, at work, or elsewhere. It clearly shows the lack of internet penetration in peripheral areas and that there are significant proportions of the core, largely in township areas at the edges, where households have no internet access. Although Census 2011 found that a higher proportion of households had access to the internet than had computers at home,

almost two thirds of households in peripheral areas (63 per cent), and half in core areas (49 per cent), had no access to the internet. The GCRO Quality of Life 2015 survey found higher proportions of households did not have an internet connection at home (66 per cent in the core, and 78 per cent in the periphery). The majority of respondents, regardless of where they lived, accessed the internet using a cell phone, which is a costly way to be connected.

Table 77: Source of access to the internet, Gauteng, 2015 (%)

SOURCE: GCRO QoL, 2015

	Any-where on my cell phone/tablet	Home	Work	Any-where on my laptop	Wi-Fi hotspot/free or public Wi-Fi	Internet Café	Library or community centre	Taxi Wi-Fi	Other
Core	75	43	32	25	17	16	5	2	9
Periphery	78	32	21	15	10	12	3	2	6

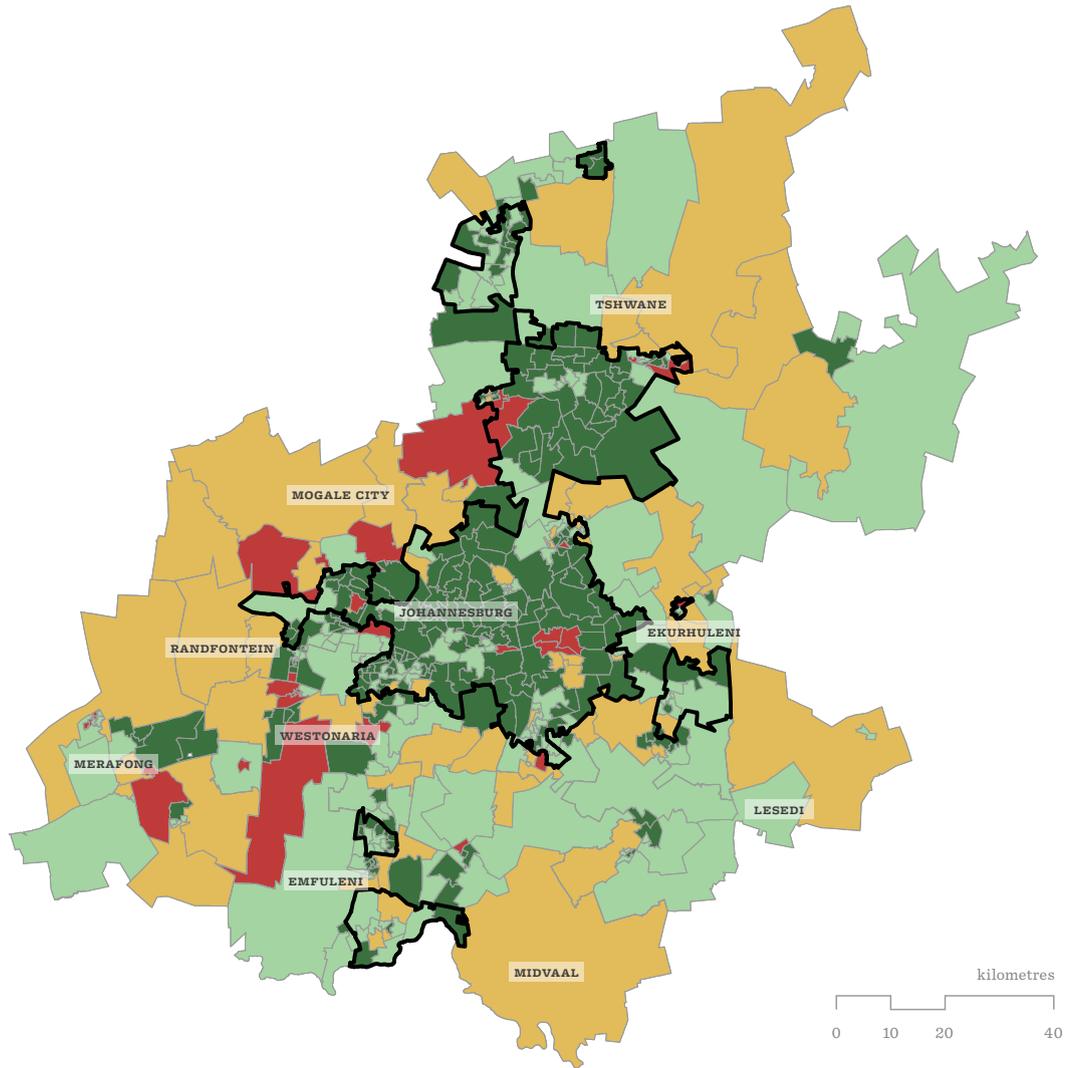
NOTE: This table only shows the proportions of those households who access the internet. Multiple response question so percentages do not add up to 100 per cent.

The use of cell phones to access the internet reflected the penetration of cell phones in Gauteng, where 95 per cent of households in the core, and 92 per cent in the periphery, had access to a cell phone in 2011. Landlines appear increasingly obsolete, with just over one in five households in the core (22 per cent), and one

in ten (11 per cent) in the periphery having a landline telephone in the house (Census, 2011). The growth in access to telephone networks is astounding, as in 1996, only 50 per cent of residents in the core, and 29 per cent in the periphery had access to a landline or cell phone (Census, 1996).

Figure 69: Households with no TV per ward (%)

SOURCE: Census, 2011



Households with no TV per ward (%)

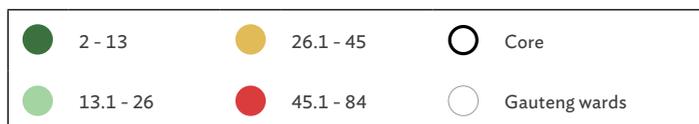
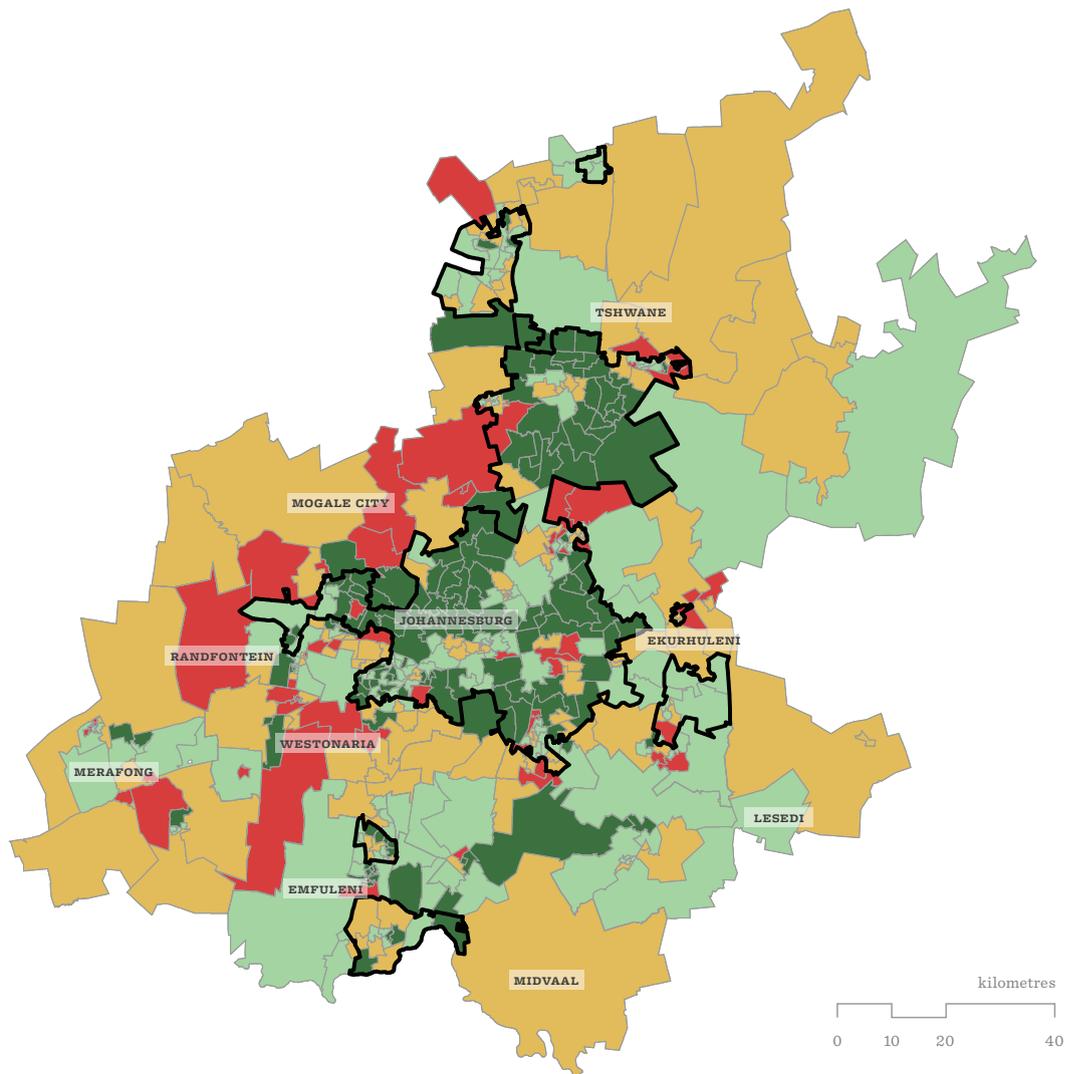
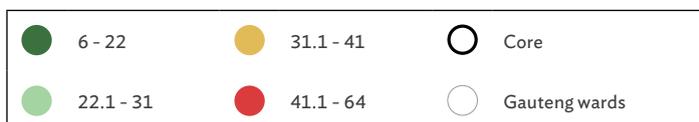


Figure 70: Households with no radio per ward (%)

SOURCE: Census, 2011



Households with no radio per ward (%)



The proportion of households in wards in peripheral areas without a television and/or radio was higher than in most wards in the core (Figures 67 and 68). Some households may lack both but that data is not available. Overall, Census 2011 found that 72 per cent of households in the core had a radio, and 84 per cent a television. Of households in the periphery, 65 per cent had a radio, and 75 per cent a television.

Ownership of radios and televisions, access to the internet, and participation by residents in public forums, all need to be taken into consideration by the various levels of government when deciding how best to communicate with residents.



Photograph by Clive Hassall

12. Conclusion

[T]he clear distinction which once existed between the urban and the rural is gradually fading into a set of porous spaces of uneven geographical development, under the hegemonic command of capital and the state. (Harvey, 2008: 36)

This report set out to explore uneven development in the province of Gauteng and the Gauteng City-Region. Using economic criteria alongside population density and types of land use to initially identify core and peripheral areas in the province, it focused on

the lives of residents in the core and peripheral areas so identified, and, where possible, the changes they have experienced in the twenty years of democratic government following the demise of apartheid in 1994. The discussion references the spatial legacy of apartheid social and economic engineering, which is seen in the persistence of peripheral areas within the economic core of the province. These areas are mostly former black townships and settlements created by the apartheid state. This legacy emphasises the role of the state, history, and

“People who live in peripheral areas were, on the whole, found to have less favourable living conditions and less access to services than people living in the core of the province.”

time, in understanding core–periphery relationships as they shift as changing political, economic and social processes inscribe themselves on space. As Henri Lefebvre argues,

Space is not a scientific object removed from ideology and politics; it has always been political and strategic. If space has an air of neutrality and indifference with regard to its contents and thus seems to be “purely” formal, the epitome of rational abstraction, it is precisely because it has been occupied and used, and has already been the focus of past processes whose traces are not always evident on the landscape. Space has been shaped and moulded from historical and natural elements, but this has been a political process. Space is political and ideological. It is a product literally filled with ideologies. (Henri Lefebvre, 1976: 31, cited in Soja, 1980: 210)

As this report focused on demographic and social issues relating to core and peripheral areas, it did not directly address the processes and flows of capital, which shape uneven development in Gauteng. However, the available data presented on the generation of GVA from primary, secondary and tertiary sectors indicate Gauteng’s place as a core area in South Africa, and highlight where core areas lie within the province (GPG, 2012). Similarly, the employment profiles, which show higher rates of employment in the primary sector in peripheral areas, suggest a core–periphery relationship. Through the data on employment, unemployment, incomes and transport, it is possible to see how, although Gauteng is itself a core area, the movement of migrants to the province has created a labour force in its peripheral areas, on the doorstep of capital, that is ripe for exploitation and the payment of low incomes. The spatial impact of migration-associated urbanisation is reinforced by the legacy of apartheid spatial patterns and new government-led housing development,

which locates workers in the periphery. The data on travel routes for going to work, and looking for work, emphasise this conclusion as the routes travelled by respondents in the GCRO Quality of Life 2013 survey are focused on the core areas and metros of Ekurhuleni, Johannesburg and Tshwane, and to a lesser extent, Emfuleni. With labour flowing to core areas of Gauteng and the GCR, it is possible for the province to grow and reinforce its place as one of the core areas, not only of South Africa, but also of the African continent. At the same time, it is reinforcing the concept of the Gauteng City-Region, which has been embraced by the Gauteng provincial government.

The demographic picture is somewhat confused and this highlights, in some ways, the role of race in shaping South Africa’s demographic landscape. Although the demographic index created in this report shows that areas that are demographically marginal are more likely to lie outside the boundaries of the core, there are those that lie within it. And wards in core areas are home to the largest proportions of people over 65 years. Similarly, the picture of the location of migrant populations is somewhat blurred. With almost half of the population of the province being migrants, it would be remarkable if they indeed fitted neatly within peripheral boundaries. Migrants find entry into an area and space to live where there is rental accommodation and residential mobility. For many cross-border migrants, expectations of xenophobia may affect the choice of where to live. Nevertheless, migrants are more likely to live in peripheral areas.

People who live in peripheral areas were, on the whole, found to have less favourable living conditions and less access to services than people living in the core of the province. Although people in peripheral areas were more likely to own their own homes, these were more likely to be RDP houses. The proportions



Photograph by Clive Hassall

of households living in informal dwellings, with inadequate access to water, electricity, sanitation and refuse removal, were disproportionately higher in peripheral areas than in core areas. These disparities did not seem to have significantly different physical, mental or emotional health impacts, however.

Although residents of peripheral areas were more likely to be dissatisfied with services and, like residents in core areas, had relatively high levels of dissatisfaction with government, residents of the periphery showed more confidence in government and democracy than those in the core. They were also more likely to take part in meetings and organisations in their communities which could affect their services.

Peripheral areas, whether rural or township, are sometimes considered to be places of community, where people know and speak to their neighbours. People in rural areas are imagined to live relatively stress-free lives, compared to those in the city. However, this report suggests that, despite their participation in civil society, residents in peripheral areas are no more likely to have confidence or trust in

the people who live in their communities. Attitudes related to social cohesion were largely similar in core and peripheral areas. Respondents in both areas showed similarly disturbing attitudes to LGBTI people and foreigners in their communities. People in peripheral areas were more likely to be fearful of crime and walking at night in their neighbourhoods, even though, in the GCRO Quality of Life 2013 survey, respondents in the periphery were slightly less likely to have been victims of crime than those in the core. Tellingly, residents in the periphery were dissatisfied with policing and the provision of other emergency services in their communities, suggesting that these areas of the province may not be policed with the same vigour as core areas, where residents were more satisfied.

Significant changes have taken place in core and peripheral areas in the past twenty years. Importantly, there has been a significant increase in population, with over 50 per cent of the increase between 2001 and 2011 being the result of in-migration from other provinces and other countries (StatsSA, 2013). This has created a large, relatively cheap and



unskilled labour force in peripheral areas, as well as within the boundaries of the core. In part, this reflects the role of Gauteng in the national economy. The growing population presents particular challenges for change and masks some of the progress made by the state in the provision of housing and services. Although progress has been made in the fields of education, housing and access to water, energy and sanitation, as regards reductions in the proportions of households without these services since 1994, larger numbers of households were without formal housing and other services in 2011 than in 1996. Significantly, much of the progress made has been in peripheral areas rather than in the core. This suggests that the state is endeavouring to reduce inequalities in the lives of people living in core and peripheral areas of the province, in the areas of education, housing and service delivery.

Authors who address the role of the state in dealing with uneven development suggest that it rarely addresses the processes which underpin spatial inequalities and the development of core and peripheral areas (Soja, 1980; Smith, 1986, 1997; Etherington and Jones,

2009), and as Gonzalez suggests, in the context of city-regions:

The main risk in the particular interpretation of the city-region agenda ... is its displacement of issues of uneven development and regional disparities by concentrating only on places that are doing well. This has at least three problematic consequences. First, the emphasis will be mainly on the urban core of the city-regions at the expense of secondary cities, smaller towns and remoter rural areas. Second, it will downplay the importance of the national scale as a frame where regional disparities are still (re)produced. Third, a reified view of scales is being used in this debate, one which assigns different functions to different scales. (Gonzalez, 2006: 317 cited in Etherington and Jones, 2009: 251)

In the case of Gauteng and the GCR, and in the context of socio-economic inequalities, in particular, the conclusions Gonzales comes to are not always valid. Significant efforts have been made to reduce inequalities between core and peripheral areas, particularly in the areas of housing and service provision. However, it should be noted that these are

“The provincial government has also introduced economic policies intended to ‘modernise’ and ‘re-industrialise’ township economies. The aim is to develop manufacturing to reduce spatial employment and income inequality.”

more visible in the peripheral areas within the cities of Johannesburg and Pretoria (rather than within the larger Tshwane area). Much of the RDP housing that has been built to relocate people from informal housing, has been built in peripheral areas that are at significant distances from the core, which is where employment opportunities are. And, the proposed mega human settlements are likely to reinforce these disparities. Thus, in the case of new housing developments it seems core-periphery relationships are being reinforced.

The Gauteng Spatial Development Framework (GPG, 2011) and its economic development proposals (GPG, 2012) planned to reduce spatial inequalities. However, a closer reading of these documents suggests that these spatial development frameworks and economic policies echo Gonzalez in that they seem to focus on the urban core and, in particular, on developing high-skilled economic development opportunities, which, it is thought, will reinforce Gauteng’s place as a global city-region. There seems to have been little reflection on the impact of these policies on peripheral spaces, and on the people living in them. These plans are likely to exclude those who lack the education and qualifications to participate in a high-skill economy (including many who live in the core). The provincial government has also introduced economic policies intended to ‘modernise’ and ‘re-industrialise’ township economies. The aim is to develop manufacturing to reduce spatial employment and income inequality. The Gauteng Spatial Development Framework (GPG, 2011) emphasises transport, but as a way to move goods and commodities faster into and out of the province, and to move labour more efficiently in from peripheral areas to potential places of work. The economic development framework also emphasises the need to develop the agricultural sector, but largely to stimulate agri-processing in

the core (GPG, 2012). These policies clearly form part of an economic trajectory that embraces capital and foreign direct investment but is unlikely to challenge the history and processes that created uneven development and contributed to the formation of the core and peripheral areas of the province and city-region.

This report provides a picture of what is happening in core and peripheral areas in Gauteng and the GCR. It identifies a number of areas that are ripe for further research. First, although it has referred to the legacy of apartheid that can still be seen in the peripheral areas identified here, it does not address how race and gender are played out within core and peripheral areas of the province. This is an important issue, given the different racial profiles of the core and periphery of the province. Second, it has not fully addressed the issue of intra-provincial flows of commodities, goods, services and capital between core and peripheral areas of the province, which would help in understanding the processes that underpin uneven development, and enable the development of strategies to mitigate it. Third, the report underscores a need to consider the role of the GCR as a core area of both the nation and the continent, and the implications of that role for the development of peripheral and core areas within the city-region and province. Finally, the report has created a binary analysis of core and peripheral areas in Gauteng and the GCR. Although attempts have been made to create a slightly more nuanced analysis through the use of ward-level data, there is a need to understand the processes underpinning uneven development, in order to develop a finer approach that moves away from a binary construction of inequality and deals with the way people live in the city-region. This report provides a basis from which to achieve that.



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Bibliography

- AMIN, S. (1976). *Unequal Development: An Essay on the Social Formations of Peripheral Capitalism*. New York: Monthly Review Press.
- APPADURAI, A. (1986). Theory in Anthropology: Center and Periphery, *Comparative Studies in Society and History*, 28(2): 356-361.
- BALIBAR, E. (2007). Uprisings in the Banlieues, *Constellations*, 14(1): 47-71.
- BARTON, J.R., GWYNNE, R.N., AND MURRAY, W.E. (2008). Transformations in Resource Peripheries: An Analysis of the Chilean Experience, *Area*, 40(1): 24-33.
- BRENNER, N. (2013). Theses on Urbanization, *Public Culture*, 25(1): 85-114.
- CALDEIRA, T.P.R. (2009). Marginality, Again?!, *International Journal of Urban and Regional Research*, 33(3): 848-853.
- CASTELLS, M. (1996). *The Rise of the Network Society, The Information Age: Economy, Society and Culture, Vol. 1*. Oxford: Blackwell.
- CENSUS (1996). Data obtained from Quantec. Available at www.quantec.co.za.
- CENSUS (2001). Data obtained from Quantec. Available at www.quantec.co.za.
- CENSUS (2011). Data obtained from Statistics South Africa (StatsSA) SuperCross dataset and Quantec. Available at www.quantec.co.za.
- CHIROT, D. AND HALL, T.D. (1982). World-system Theory, *Annual Review of Sociology*, 8: 81-106.
- DAMON, K. (2012). How can GIS Determine Core and Peripheral Regions in Gauteng?, Unpublished paper, Gauteng City-Region Observatory (GCRO), Johannesburg.
- ERAYDIN, A. (2011). Changing Istanbul City-region Dynamics: Re-regulations to Challenge the Consequences of Uneven Development and Inequality, *European Planning Studies*, 19(5): 815-837.
- ETHERINGTON, D. AND JONES, M. (2009). City-Regions: New Geographies of Uneven Development and Inequality, *Regional Studies*, 43(2): 247-265.
- EVERATT, D. (2012). *Summary Analysis for Gauteng from the National Census, 2011*, GCRO Data Brief No. 2, Gauteng City-Region Observatory (GCRO), Johannesburg.
- FELZENSTEIN, C., GIMMON, E. AND AQUEVEQUE, C. (2013). Entrepreneurship at the Periphery: Exploring Framework Conditions in Core and Peripheral Locations, *Entrepreneurship Theory and Practice*, July: 815-835.
- FORCED MIGRATION STUDIES PROGRAMME (FMSP). (2009). *Humanitarian Assistance to Internally Displaced Persons in South Africa: Lessons Learned Following Attacks on Foreign Nationals in May 2008*, FMSP: University of the Witwatersrand, Johannesburg.
- GAUTENG CITY-REGION OBSERVATORY (GCRO). Website. Available at www.gcro.ac.za.
- GAUTENG CITY-REGION OBSERVATORY (GCRO). (2013a). Quality of Life (QoL) Survey. Data available online at <http://gcro1.wits.ac.za/qolvviewer/>.
- GAUTENG CITY-REGION OBSERVATORY (GCRO). (2013b). *Geographical Distribution of SARChi Chairs, 2006-2012*, GCRO Vignette No. 10, Gauteng City-Region Observatory (GCRO), Johannesburg.
- GAUTENG CITY-REGION OBSERVATORY (GCRO). (2015). Quality of Life (QoL) Survey. Preliminary results available online at: www.gcro.ac.za.

- GAUTENG PROVINCIAL GOVERNMENT (GPG). (2011). *The Gauteng Spatial Development Framework, February*, Gauteng Provincial Government, Johannesburg.
- GAUTENG PROVINCIAL GOVERNMENT (GPG). (2012). *Provincial Economic Review and Outlook 2012*, Gauteng Provincial Government, Johannesburg.
- GAUTENG PROVINCIAL GOVERNMENT (GPG). (2014). *Gauteng. A Better Place to Live. Gauteng Provincial Government Review of 20 Years of Democracy, 1994-2014*, Gauteng Provincial Government, Johannesburg.
- GAUTENG PROVINCIAL GOVERNMENT (GPG). (2016). *The Economy of Gauteng*. Available at www.gautengonline.gov.za/Business/Pages/TheEconomyofGauteng.aspx, accessed 24 March 2016.
- GONZALEZ, S. (2006). *The Northern Way: A Celebration or a Victim of the New City-Regional Government Policy?* ESRC/DCLG Post-graduate Research Programme Working Paper No. 28. ESRC, Swindon.
- GREENBERG, S. (2010). *The Political Economy of the Gauteng City-region*, Occasional Paper No. 2, Gauteng City-Region Observatory (GCRO), Johannesburg.
- GURUNG, G.S. AND KOLLMAIR, M. (2005). *Marginality: Concepts and their Limitations*, IPG Working Paper No. 4, University of Zurich.
- HABIB, A. (2005). *State-Civil Society Relations in Post-Apartheid South Africa*, *Social Research*, 72(3): 671-692.
- HARMSE, A. (2009). *Evaluating Development Regions in the South African Space Economy*, *PositionIT*, March 2009: 60-64.
- HARRISON, J. (2013). *Configuring the 'New Regional World': On Being Caught Between Territory and Networks*, *Regional Studies*, 47(1): 55-74.
- HARVEY, D. (1970). *Social Processes and Spatial Form: An Analysis of the Conceptual Problems of Urban Planning*, *Papers of the Regional Science Association*, 25: 47-69.
- HARVEY, D. (1973). *Social Justice and the City*. Baltimore: Johns Hopkins University Press.
- HARVEY, D. (2008). *The Right to the City*, *New Left Review*, 53: 23-40.
- HAYNES, M. (1998). *European Union and its Periphery: Inclusion and Exclusion*, *Economic and Political Weekly*, 29 August: 87-97.
- HAYTER, R., BARNES, T.J., AND BRADSHAW, M.J. (2003). *Relocating Resource Peripheries to the Core of Economic Geography's Theorizing: Rationale and Agenda*, *Area*, 35(1): 15-23.
- HOLSTON, J. AND CALDEIRA, T. (2008). *Urban Peripheries and the Invention of Citizenship*, *Harvard Design Magazine*, 28: 19-23.
- ILBERY, B.W. (1984). *Core-Periphery Contrasts in European Social Well-being*, *Geography*, 69(4): 289-302.
- JONAS, A.E.G. AND WARD, K. (2007). *Introduction to a Debate on City-Regions: New Geographies of Governance, Democracy and Social Reproduction*, *International Journal of Urban and Regional Research*, 31(1): 169-178.
- KELLEY, D., SINGER, S. AND HERRINGTON, M. (2016). *Global Entrepreneurship Monitor 2015/16 Global Report*. GEM Consortium. Available at www.gemconsortium.org.
- KUNDU, A., PRADHAN, B.K. AND SUBRAMANIAN, A. (2002). *Dichotomy or Continuum: Analysis of Impact of Urban Centres on their Periphery*, *Economic and Political Weekly*, 14 December.

- LANDAU, L. (2012). Hospitality Without Hosts: Mobility and Communities in Africa's Urban Estuaries. Paper presented at WISER, University of the Witwatersrand, Johannesburg.
- LEFEBVRE, H. (1976). Reflections on the Politics of Space, translated by M. Enders, *Antipode*, 8(2): 30-37.
- LONG, D.P. AND HOOGENDOORN, G. (2012). Overshooting the Environmental Carrying Capacity for Second-Home Tourism. Unpublished paper presented to the Department of Geography, University of the Witwatersrand, Johannesburg.
- MABIN, A., BUTCHER, S. AND BLOCH, R. (2013). Peripheries, Suburbanisms and Change in Sub-Saharan African Cities, *Social Dynamics*, 39(2): 167-190.
- MAKHULU, A.-M. (2010). Ethics of Scale: Relocating Politics after Liberation. The 'Dialectics of Toil': Reflections on the Politics of Space after Apartheid, *Anthropological Quarterly*, 83(3): 551-580.
- MASSEY, D. (1979). In What Sense a Regional Problem? *Regional Studies*, 13: 233-243.
- MCDONALD, D.A. (2008). *Electric Capitalism*. Routledge: London.
- MCDONALD, D.A. AND RUITERS, G. (eds). (2005). *The Age of Commodity: Water Privatization in Southern Africa*. London: Earthscan.
- MEHRETU, A., PIGOZZI, B.W. AND SOMMERS, L.M. (2000). Concepts in Social and Spatial Marginality, *Geografiska Annaler*, 82(2): 89-101.
- MISAGO, J.P., LANDAU, L. AND MONSON, T. (2009). *Towards Tolerance, Law and Dignity: Addressing Violence against Foreign Nationals in South Africa*, International Organisation for Migration: Johannesburg.
- NATIONAL PLANNING COMMISSION (NPC). (2011). *National Development Plan 2030*, The Presidency: Pretoria.
- NAUDE, W. (2008). Is There a Spatial Mismatch in South Africa's Metropolitan Labour Market? *Cities*, 25: 268-276.
- NEWS24. 2016. *Highest voter turnout ever recorded for local elections*, 7 August. Available at <http://www.news24.com/elections/news/highest-voter-turnout-ever-recorded-for-local-elections-2016087>, accessed 8 August 2016.
- NYAR, A. (2013). *Transformation of Higher Education in the GCR*, GCRO Data Brief No. 4, Gauteng City-Region Observatory (GCRO), Johannesburg.
- OPPONG, J.R., IRONSIDE, R.G. AND KENNEDY, L.W. (1988). Perceived Quality of Life in a Centre-Periphery Framework, *Social Indicators Research*, 20: 605-620.
- PAIN, K. (2008). Examining 'Core-Periphery' Relationships in a Global City-Region: The Case of London and South East England, *Regional Studies*, 42(8): 1161-1172.
- PEBERDY, S. (2013a). Gauteng: A Province of Migrants, GCRO Data Brief No. 5, Gauteng City-Region Observatory (GCRO), Johannesburg.
- PEBERDY, S. (2013b). From the Past to the Present: Regulating Migration and Immigration in Post-apartheid South Africa, *Journal für Entwicklungspolitik (JEP) (Austrian Journal for Development Studies)*, 29(4): 67-93.
- PEBERDY, S. AND CRUSH, J. (2007). Histories, Realities and Negotiating Free Movement in Southern Africa, in A. Pecoud and P. de Guchteneire (eds), *Migration Without Borders*, New York: Berghahn Books, pp. 175-197.
- PEBERDY, S., WILLIAMS, V., LEFKO-EVERETT, K. AND CRUSH, J. (2008). *South Africa's Immigration Framework*, Report for the Department of Home Affairs, Southern African Migration Project.
- PECOUD, A. AND DE GUCHTENEIRE, P. (eds). (2007). *Migration Without Borders*, Berghahn Books: New York.

- PILEČEK, J. AND JANČÁK, V. (2011). Theoretical and Methodological Aspects of the Identification and Delimitation of Peripheral Areas, *AUC Geographica*, 46(1): 43-52.
- QUANTEC. Online. Available at www.quantec.co.za.
- ROY, A. (2009). The 21st Century Metropolis: New Geographies of Theory, *Regional Studies*, 43(6): 819-830.
- ROY, A. (2011). Slumdog Cities: Rethinking Subaltern Urbanism, *International Journal of Urban and Regional Research*, 35(2): 223-238.
- SIMONE, A. M. (2007). At the Frontier of the Urban Periphery, in M. Narula, S. Sengupta, J. Bagchi and R. Sundaram (eds.) *Sarai Reader 07: Frontiers*, Delhi: Sarai: 462-470.
- SMITH, N. (1986). On the Necessity of Uneven Development, *International Journal of Urban and Regional Research*, 10(1): 87-104.
- SMITH, N. (1997). The Satanic Geographies of Globalization: Uneven Development in the 1990s, *Public Culture*, 10(1): 169-189.
- SMITH, N. (2008). *Uneven Development: Nature, Capital and the Production of Space*. Athens, GA: University of Georgia Press.
- SOJA, E.W. (1980). The Socio-spatial Dialectic, *Annals of the Association of American Geographers*, 78(2): 207-225.
- SOJA, E.W. (1999). In Different Spaces: The Cultural Turn in Urban and Regional Political Economy, *European Planning Studies*, 7(1): 65-75.
- SORINEL, C. (2010). Immanuel Wallerstein's World System Theory, *Annals of Faculty of Economics, University of Oradea*, 1(2): 220-224.
- SOUTH AFRICAN CITIES NETWORK (SACN). (2012). *Secondary Cities in South Africa: The Start of a Conversation*, South African Cities Network, Johannesburg.
- SOUTH AFRICAN CITIES NETWORK (SACN). (2013). *The Space Economy: An Important Consideration in Spatial Development Planning*, Dialogue Report, South African Cities Network, Johannesburg.
- STATISTICS SOUTH AFRICA (StatsSA). (2013). *Mid-year Population Estimates, 2013, Statistical Release P0302*, Statistics South Africa, Pretoria.
- STATISTICS SOUTH AFRICA (StatsSA). (2015). *Mid-year Population Estimates, 2015, Statistical Release P0302*, Statistics South Africa, Pretoria.
- STATISTICS SOUTH AFRICA (StatsSA). (2016). *Community Survey 2016, Statistical Release P0301*, Statistics South Africa, Pretoria.
- STIGLITZ, J.E., SEN, A. AND FITOUSSI, J-P. (2009). *Report by the Commission on the Measurement of Economic Performance and Social Progress*, Republic of France. Available at www.stiglitz-sen-fitoussi.fr.
- TERLOUW, C.P. (1993). The Elusive Semiperiphery: A Critical Examination of the Concept Semiperiphery, *International Journal of Comparative Sociology*, 34(1-2): 87-102.
- TERLOUW, K. (2002). The Semiperipheral Space in the World-system, *Review (Fernand Braudel Center)*, 25(1): 1-22.
- THE PRESIDENCY. (2007). *National Spatial Development Perspective*, The Presidency, Pretoria.
- TREGENNA, F. (2007). *Measuring Intersectoral Outsourcing in South Africa*, HSRC Working Paper, Pretoria.

VAN HAMME, G. AND PION, G. (2012). The Relevance of the World-system Approach in the Era of Globalization of Economic Flows and Networks, *Geografiska Annaler: Series B*: 65-82.

VAN HUYSSSTEEN, E. AND BOTHA, A. (2009). A National Overview of Spatial Trends and Settlement Characteristics, October 2008 – Draft. Paper prepared for the South African Cities Network, The Presidency and Department of Local and Provincial Government by the CSIR, Built Environment.

VILLAVERDE, J. AND MAZA, A. (2011). *Regional Disparities in the EU: Are they Robust to the Use of Different Measures and Indicators?* Report No. 4, Swedish Institute for European Policy Studies, Stockholm.

WALLERSTEIN, I. (1974). *The Modern World-system*. New York: Academic Press.

WALLERSTEIN, I. (1979). *The Capitalist World-economy*. Cambridge: Cambridge University Press.

WANMALI, S. AND ISLAM, Y. (1997). Rural Infrastructure and Agricultural Development in Southern Africa: A Centre-Periphery Perspective, *The Geographical Journal*, 163(3): 259-269.

WIBBELS, E. (2009). Cores, Peripheries, and Contemporary Political Economy, *Studies in Comparative Economic Development*, 44: 441-449.

WILSON, F. (2011). Historical Roots of Inequality in South Africa, *Economic History of Developing Regions*, 26(1): 1-15.





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Part B

Gauteng – on the edge

PHILIP HARRISON AND YASMEEN DINATH

1. Context

1.1 Introduction

This second part of the report addresses the straightforward empirical question: What is happening along the spatial edges of the Gauteng City-Region (GCR)? The previous part made the point that spatial edges do not necessarily coincide with economic and social peripheries. It is quite possible, as Sally Peberdy explains, to have places of wealth and economic prosperity on the spatial margins, and places of poverty and economic decline in the spatial centre.⁸ This part of the report makes a similar observation, although from a different angle. It shows that there are variant dynamics of growth and decline along the edges of the GCR, with relative spatial marginality both attracting and deterring new development.

An immediate challenge is to explain what is meant by the 'spatial edge of the GCR'. The GCR is, of course, a subjective construct, with its boundaries continually open to contested definition, both technically and politically (Mabin, 2013; Mubiwa and Annegarn, 2013; Gotz et al., 2014).

The current consensus may be that most, if not all, of the province of Gauteng falls within the GCR. If, however, we look beyond the boundaries of Gauteng, the definitional uncertainties increase. It may seem evident, for example, that Sasolburg in the Free State should be considered part of the GCR, but should we also include the Rustenburg Platinum Belt, the Sun City entertainment complex, the gold-mining districts around Klerksdorp-Potchefstroom, and the mining-industrial complex around Witbank, Middelburg and Evander?

We won't linger too long on this question as there is no objective resolution, although we may meaningfully use criteria such as the extent of commuting flows to at least provide a plausible, interim, technical answer. As case-studies for this part, we have chosen a number of places that would generally be accepted as being part of the GCR. They fall roughly on the edge of Gauteng Province rather than on the boundaries of an expanded conception of the GCR. They fall also within a belt of spatial

8. This does not mean, however, that spatial distance has no meaning in terms of economic and social prosperity. Time-cost does matter, but the significance of time-cost is mediated by a range of factors including the dynamics and structure of the economy, the quality of the local workforce, the spatial distribution of social capital, and knowledge accessibility (for example, Banister and Berechman, 2001; Iyer et al., 2005; Andersson and Karlsson, 2007; Vickerman et al., 2009).

“

The GCR is, of course, a subjective construct, with its boundaries continually open to contested definition, both technically and politically.

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peripherality rather than a specifically-defined outer line, an approach that is consistent with references to a 'perimetropolitan zone'⁹ (for example, Hart, 1991).

In terms of structure, this part of the research report is divided into three sections. The first section is 'context' and includes this introduction, followed by an account of the relevant literature and a historical overview of the development of the spatial peripheries of the GCR. The second section is the substantive core of the study, which comprises six narratives – our case studies – organised into four themes:

- Extractive economies on the edge (Carletonville and Nigel-Heidelberg);
- State-implanted industry on the edge (The Vaal, including Vereeniging, Vanderbijlpark and Sasolburg);
- Revisiting the decentralised growth points (Babelegi and Bronkhorstspuit);
- Recreational hubs on the edge (Hartbeespoort).

The third section draws conclusions from the narrative, indicating, for example, the driving forces of change along the spatial periphery, and the themes that require further investigation.

Our **method of investigation** was fairly simple. We began by familiarising ourselves with the spatial edges of the GCR through: a desktop review of existing written material, a broad analysis of maps and aerial photographs, a scan of public and private datasets, an initial review of municipal plans and policies, and site visits. We then identified six locales along the edge to illustrate six different developmental processes:

- **Carletonville-Khutsong** was selected to illustrate a local economy, long dominated by gold mining, that has struggled to diversify, and that has not, as yet, ensured its sustainability beyond mining.
- **Nigel and Heidelberg** are two medium-sized towns on the Far East Rand, a little over 10 km apart,

although in different municipalities. Together they illustrate modest success in diversifying beyond mining, especially into manufacturing.

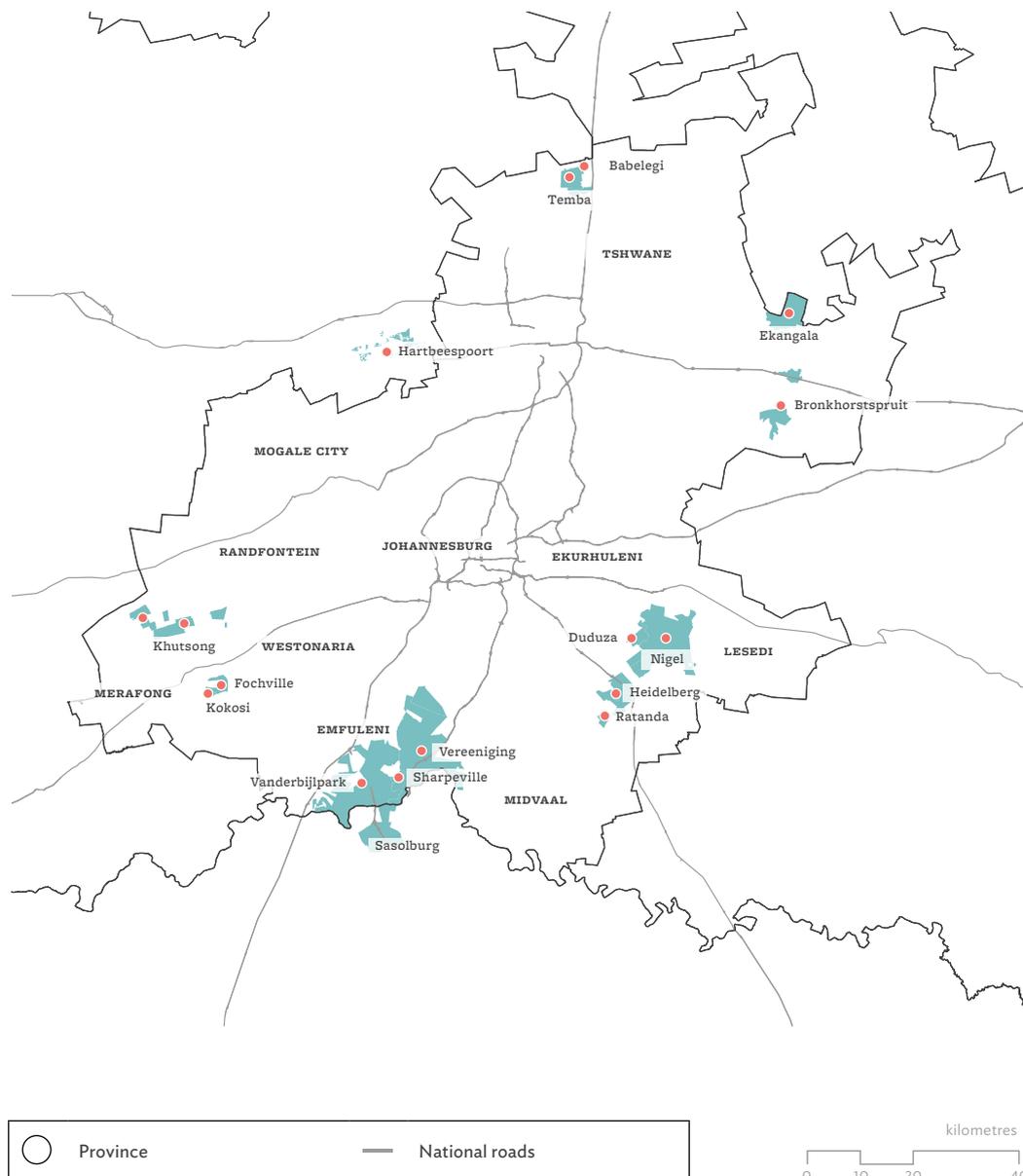
- **Vereeniging, Vanderbijlpark and Sasolburg**, together with townships such as Boipatong, Sharpeville and Sebokeng, and smaller towns including Meyerton and Walkerville, form the Vaal Triangle, which is a major illustrative case of the spatial impacts of state-led industrialisation.
- **The Babelegi industrial estate** forms part of a cluster of settlements (including Temba and Hammanskraal) in the far north of the Tshwane metropolitan city, in what has been referred to as a zone of displaced urbanisation. It is a key example of an apartheid-era industrial development point that was established *within* a homeland (in this case, Bophuthatswana).
- **Bronkhorstspuit-Ekangala** is a key example of a long-established agricultural service centre that experienced investment under apartheid's regional industrial-development programme, and is now enjoying a mini-boom as a result of major developments in the energy sector, and some renewal in manufacturing.
- **Hartbeespoort** provides a vivid illustration of a recreational and tourist hub that emerged around a state-constructed dam, and that has been through a variable pattern of development, including a recent property boom.

Our main method of case-based analysis was the construction of spatially-located narratives, which were put together using a variety of information sources including media articles, census data, research reports, local plans, corporate websites, and a few selected interviews. Through narrative, we try to explain how and why particular places have progressed, regressed or stagnated. Although we cannot generalise from individual cases, we do provide insight and suggest lessons that could at least be interpreted for other places.

9. In the case-studies narratives, we deal broadly, but not comprehensively, with the processes shaping 'perimetropolitan' Gauteng. We must acknowledge, for example, that agriculture still plays a shaping role in these areas. It may, as a sector, only contribute 0.5 per cent of Gauteng's Gross Value Added (GVA) but it remains the largest land consumer within the perimetropolitan belt and it underpins the development of agro-processing, which is one of drivers of perimetropolitan growth. The urban areas around Gauteng provide a steady demand for agricultural produce, and so agricultural activity is often more intense around the metropolitan area than in more outlying places. The selected case-studies do not necessarily pick up on the continued significance of agriculture, with the possible exception of Heidelberg, where agriculture is the third largest contributor to GVA after manufacturing (mainly agro-industry) and government services (Abrahams, 2007).

Figure 71: Location of case-study areas

MAP PREPARED BY Miriam Maina





Photograph by Skhumbuzo Mtshali

1.2 Literatures

We can draw on various literatures in thinking about processes on the edges of large urban agglomerations, but these must, however, be used with caution and translated carefully in the context of our study.

Rethinking agglomeration

A first set of literature is about the advantages of the agglomeration of human activity. In its early incarnations, this literature suggested that high-order economic development would accumulate in the spatial core, leaving lower-order activities on the edge. In the spatial sciences, this theory goes back to the late nineteenth century, with the work of J.H. Von Thunen on patterns of agricultural activity on rural land, and also to Burgess, a prominent figure in the Chicago School of Urban Sociology in the 1920s, who described urban expansion in terms of concentric rings of development. In the 1950s and 1960s, these ideas were developed with greater precision by regional scientists such as Walter Isard and William Alonso, who developed the famous Bid-Rent Model, based on the idea of 'distance decay' (Isard, 1956; Copus, 2001).

From the 1950s, these ideas were reinforced by development economists such as Myrdal, Hirschmann and Friedmann, who argued that the

advantages of agglomeration – including labour pooling, proximity to suppliers and purchasers, and rapid transfer of information – activate a process of 'cumulative causation', which progressively reinforces the dominant position of the core. In 1991, Paul Krugman, recipient of a Nobel Prize in Economics, introduced his core-periphery model which argued that economic regions that already have high levels of productions will be the most profitable, attracting even more production. In simple terms, success breeds success, creating increasing differentiation between the cores and peripheries at all spatial scales (Krugman, 1991).

The difficulty with the straightforward application of agglomeration is that it didn't always accord with practice. There are, of course, many large, fast-growing cores, but also stagnant and declining cores. Equally, there are places on the periphery with a strong growth dynamic. This suggests that there may be various processes at work, not only the operation of agglomeration economies. Krugman himself was to acknowledge that, in addition to the benefits of agglomeration, there are also downsides to concentration, such as congestion, high land costs, and environmental damage. Whether or not an industry concentrates or disperses will depend on the relative weight of the benefits and negatives in a particular context (Krugman, 1995; Krugman and

“It is the complexity and contingency of the multiple processes at work in regional development that directs us again to an exploration of what is actually happening in specific places.”



Venables, 1996). Fujita and Thisse (2013: 10) make a similar point in their discussion of the contextually-specific interplay between the benefits of ‘nearness’ and ‘farness’:

Specifically, the location of human activity can be viewed as the interplay between the need for proximity and a crowding out effect: agents benefit from proximity to one another or to some place, but face tougher competition in the use of scarce resources such as land and a green environment.

While most economic geographers still acknowledge the benefits of agglomeration, concentration and density, they now offer more complex perspectives. Sturgeon (2003: 199), for example, accepts that the advantages of agglomeration do not always materialise within a single activity hub but may be realised within a ‘modular production network’. This networked notion of agglomeration is recommended in the concept of ‘polycentric development’ which is now highly influential in urban policy (Copus, 2001; Davoudi, 2003).

Then, there is the concept of a ‘value chain’ which suggests that the linkages which create economic advantage are to be found in the interactions and processes that progressively add value as a commodity is conceived, assembled and distributed. The chain as a whole is vertically integrated through intra-firm management, inter-firm contracting and trade networks, but the components of the chain may be *spatially separated* (Gereffi et al., 2005). The spatial application of product life cycle (PLC) theory¹⁰ suggests that different places – including those on

the spatial periphery – may play a role in supporting enterprise at different stages of the firm’s or industry’s life cycle. The argument is that the life cycle begins mainly in the metropolitan core where the clustering of skills, venture capital, knowledge spill-overs and institutional capacity supports innovation. However, as industries grow and mature – and as the nature of competition shifts from product competition to cost competition – firms frequently migrate to more peripheral locations where land and labour costs are lower (Duranton and Puga, 2001; Capasso et al., 2011).¹¹

It is the complexity and contingency of the multiple processes at work in regional development that directs us again to an exploration of what is *actually* happening in specific places. This requires us to adjust traditional conceptions of agglomeration and core–periphery, and take a more complex, and contextually informed, view of what is driving change.

The ‘edge city’

We cannot avoid referring to the ‘edge city’, although its relevance to the study of the spatial margins of the GCR is questionable. Originating in the classic North American text, *Edge City: Life on the New Frontier* (Garreau, 1991), the idea of the edge city has been taken up in a sprawling literature. The edge city refers to mass-scale private-led developments outside of the historical downtowns. The edge cities are tied back to the old core through a network of “jetways, freeways and rooftop satellite dishes” (Garreau, 1991: 4). At the time of writing, Garreau had

10. Levitt (1965) introduced PLC theory by arguing that industries have a life cycle, beginning with an explorative entrepreneurial phase when new products are introduced, and ending with the final depletion of technological and market opportunities (unless, of course, new innovation allows for re-creation).

11. There is a recognition that there is no generic life cycle, since different industries and firms reveal many variants. High-order finance and business services, for example, often remain concentrated in the historic core through their entire life cycles as they require highly specialised regulatory systems and low-risk environments. Information and communications technology (ICT) firms, on the other hand, may seek new clusters, often beyond the historic core, where new forms of specialised infrastructure can be provided from scratch (Copus, 2001; Norton and Rees, 2007).

“the Americans’ idea of what makes up a city no longer matches reality ... the old-fashioned downtown is the relic of the past”

identified around two hundred new edge cities across the United States, each of them larger than downtown Portland, Oregon.

Scholars offered other terms, apart from edge city, including ‘post-suburbia’ (Bontje, 2004), ‘exurbia’ (Nelson, 1992), ‘exopolis’ (Soja, 1996), ‘outer cities’ (Newman and Kenworthy, 1989), ‘superurbia’ (Adell, 1999) and ‘perimeter cities’ (Fishman, 1987). Different variants of the edge city were identified and were labelled variously as ‘technopoles’ (Castells and Hall, 1995), ‘aerotropolis’ (Kasarda and Lindsay, 2011), ‘funurbia’ (or entertainment cities) (Bontje, 2004), ‘finance cities’ (Bontje and Burdock, 2005), and ‘ICT clusters’ (Van Winden et al., 2004).

Edge cities have also now been identified across many parts of the world, including in the United Kingdom (for example, Phelps, 1998), in Western Europe (Bontje and Burdock, 2005), in Eastern Europe and the former Soviet Union (Rudolph and Brade, 2005; Dövényi and Kovács, 2006; Zeković et al., 2007), and in East Asia where edge city developments have happened at an extraordinarily large scale (Douglass and Huang, 2012; Lin, 2001; Yu and Ng, 2007; Wang et al., 2009; Yaping and Min, 2009).¹²

We can hardly ignore the weight of this literature, although there are emergent critiques. Beauregard (1995 and 1997) argues, for example, that the case for the edge city as the leading form of new urban development was overstated. He points out that edge cities are layered on historical urban processes, with developments continuing in the historical core and in the older suburbs, and that the focus on edge cities may even be ill-advisedly “peripheralizing the centre” (1997: 708). Lang and LeFurgy (2003: 427) believe that the edge city literature has focused too much attention

on well-defined mega developments, and too little on the sprawling developments “that never reach the scale, density, or cohesiveness of edge cities”. They refer rather to “edgeless cities” (Lang and LeFurgy, 2003: 427). There are also commentators who suggest that edge city literature has thrived on hype – Joel Garreau was, after all, a journalist by profession – and that it may be more useful to consider ‘intermediate’ or ‘mundane’ cases on the urban edge rather than only the more spectacular developments (Lang, 2003; Wolf and Gertler, 2004; Phelps, 2004; Holloway and Hones, 2007).

What the edge city literature does do very effectively is challenge any legacy conception that development intensity and land value invariably declines with spatial distance from the core. For Garreau (1991: 25), “the Americans’ idea of what makes up a city no longer matches reality ... the old-fashioned downtown is the relic of the past”. In this sense, it may be a valuable antidote to the classical distance–decay models, although the pendulum may now have swung too far in the opposite direction.

For our study, edge city literature may be most helpful in offering the possibility that the spatial edge may be a new economic centrality. However, the sort of edge cities written about by Garreau and others are not a feature of the edges of the GCR. They do exist in the GCR but are rather a feature of places closer in to the core. The emergence of the Sandton CBD in the 1970s and 1980s may, for example, be termed an edge city development. Large-scale private-driven developments in Midrand, Fourways, Sunninghill, Centurion, and Menlyn in Pretoria East, may also be regarded as edge city developments.¹³ The large settlements that do exist on the edges of the GCR

12. Yu and Ng (2007) usefully described the large-scale developments on the urban edge as a form of “diffusion-coalescence”.

13. Michel and Scott (2012: 104) suggest that Umhlanga Ridge north of Durban has “the characteristics of a possible Edge City”.



Photograph by Clive Hassall

have quite different origins, having originated mainly through mining or as the product of state planning or policy. They may be better understood as forms of planned satellite cities.

Satellite city literature¹⁴

In the decades following World War II, many countries responded to perceived congestion and urban decay by developing satellite settlements beyond the edges of existing urban agglomerations. In most cases, there was an attempt to create self-contained settlements with a balance of work and residence, but in some countries such as Sweden, there was a more pragmatic approach, which included strengthening transport linkages between satellites and the core cities. By the 1990s, the idea of satellite cities had lost favour in many countries, although there is now a new wave of satellite-type developments in regions such as East Asia and the Middle East, with considerable interest also in parts of Africa (Harrison and Todes, 2016).

The outcomes and experiences of satellite cities are discussed in the literature, which pays attention, for example, to the extent to which self-containment was actually achieved, and whether sustainable economies were established. The literature shows how difficult it is to achieve sustainable economies within new planned settlements. Where economic success was initially achieved, the growth impetus was often lost during periods of economic downturn (Ward, 1993). Many of these settlements are also

extremely vulnerable to wider processes of economic restructuring (Ward, 1993; Gaborit, 2010). Generally, settlements with more diversified economies and better locations relative to transport networks and the core cities do better (Turok, 1990; Alexander, 2009). Very few settlements succeeded in matching the levels of population with jobs, and many planned satellite cities effectively became dormitory towns (Cervero, 1995). Overall, the objectives of planned satellite cities have generally proven to be highly elusive (Harrison and Todes, 2016).

In Gauteng, there is a long history of state- and private sector-led satellite town development. This has included settlements built around the mining sector (for example, Carletonville); later development of towns focused on heavy industry (for example, Vanderbijlpark, Sasolburg); and displaced urban settlements around the apartheid-era industrial decentralisation points (for example, Ga-Rankuwa, Soshanguve, Hammanskraal-Temba and Ekangala-Ekandustria). As we shall see, there was some early success in building the economies of satellite cities in Gauteng, but these developments have proven vulnerable to changing global conditions, shifts in policy, and new local dynamics.

Space economy

While literatures on edge cities and satellite cities deal with specific forms of development on or beyond the urban edge, there is also an important

14. An extensive review of this literature, with an application also to the GCR, is provided in Harrison and Todes (2016), which is to be revised for re-publication.

literature which explores the space economy in an integrated way. This literature is not specifically about the edges of metropolitan cities or city-regions, but does provide a means of understanding the complex interactions between economic change and spatial development.

Doreen Massey's *Spatial Divisions of Labour* (1995) is the classic work that showed how local spatial change was the outcome of interactions between macro-economic forces, state policies, the organisation of both capital and labour, and local social processes. While Massey linked local spatial changes to the powerful forces shaping global economies, she did not do this in a mechanistic way. She understood, for example, that these processes are not happening in a void but are layered on existing historical patterns, which play a key role in shaping contemporary outcomes. She also understood that the local spatial outcomes of larger forces are mediated by multiple political, social and institutional realities, although there are critics who argue that she didn't go far enough in this direction.

Other writers, too, have explored the nature of regional economies, showing how regional economies are affected by macro-forces, but also how the organisation of regional economies shapes actual outcomes. Storper (1997) considered ways in which technological change leads to the fall and rise of products and production processes, and how this

transmits also into processes of regional development. Like Massey, Storper did not ignore the effects of local organisation, and, especially, the ways in which the strength of relationships between economic actors influences the capacity of regions to adapt to changes. An important discussion in this literature is the way in which regional economies become locked into particular development paths that lose dynamism when the global economy changes (for example, Martin and Sunley, 2006).

From these leading contributions, a considerable literature developed around 'spatial restructuring' which is far too extensive to review here. The South African literature that draws on these ideas includes Gillian Hart's now classic *Disabling Globalization: Places of Power in Post-Apartheid South Africa* (2002), and also contributions by Chris Rogerson (Rogerson and Rogerson, 1999) on industrial restructuring on the Witwatersrand, and John Pickles (1991) and Alison Todes (1998) on economic and spatial processes on the former homeland periphery.

The international and local literature speaks forcefully to a number of the case-studies in our study. The most obvious instance of relevance may be the Vaal Triangle. This area, with its steel and petrochemical industries, is deeply embedded within global markets and production circuits, and continually buffeted by change over which it has little apparent influence, although corporate strategies and



Photograph by Clive Hassall

government policies (for example, tariff structures) have influenced local economic performance and spatial outcomes.

Peripheries and ‘suburbanisms’

There are various literatures which explore the edges of large urban agglomerations in different parts of the world in ways that are more expansive than a focus only on edge or satellite cities or space economies. This field of study goes back at least to the 1940s when geographers wrote of a ‘rural–urban interface’ or an ‘urban fringe’, and to various attempts in the 1950s and 1960s to identify an ‘in-between’ which is not suburban but which is also not evidently rural (see Adell, 1999, for a review). There was a growing recognition that these places beyond suburbia may hold certain advantages for development – they may be close enough to the urban core to benefit from agglomeration economies, but far away enough to avoid the tough competition, and high land and labour costs, in the centre (Adell, 1999).

Friedmann and Miller (1965) envisaged a new spatial order in which urban living would penetrate deeply into the *inter-metropolitan belt*, unifying core and periphery in a single matrix. Hart (1991) followed by referring to a *perimetropolitan zone* around metropolitan cities in the USA, using a concept which was adapted from the French notion of *périurbanisation*, which implies both the outward dispersal of urban activities into rural areas, but also the dissemination of rural lifestyles and ideologies into urban space (Adell, 1999). In Australian literature, *perimetropolitan zones* extend beyond the outer suburbs of large cities to incorporate a diverse network of urban areas – mining, industrial, tourist and agricultural towns – that are linked to the metropolis but still partly embedded within a matrix of rural

land (for example, Murphy and Burnley, 1993; Burnley and Murphy, 1995, 2005). Perimetropolitan zones are highly diverse in social and settlement structure as they bring together long-established rural and small town residents and new urban arrivals from different social strata (Murphy and Burnley, 1993; Burnley and Murphy, 1995, 2005).

There is also now a wide use of the term *perímetro* in Latin American literature. Recent work by Rainer Randolph and colleagues on Rio de Janeiro concludes, for example, that rapid expansion of transport infrastructure, with a shift in investment towards the *perímetro*, is significantly changing the nature of metropolitanisation, which can no longer be understood as an extrapolation of existing forms (Randolph and Gomes, 2007). Aguilar (2008), and Aguilar and Ward (2003) report on metropolitan change in Mexico and refer variously to ‘meta-urban peripheries’, ‘extended metropolitan areas’ and ‘outer metropolitan space’. Aguilar (2008: 134) observes that the development of these extended metropolitan regions “tends to follow a pattern of low density, with polycentric islands, expanded fringes, and linear developments of higher densities”. Aguilar and Ward (2003) show how complex and polynucleated the perimetropolitan belts are becoming, pointing also to the consequences of fragmented administrative jurisdiction in these areas, for instance, with regard to environmental risk and social exclusion. Firman (2009) similarly tells the story of rapid metropolitan expansion in the Jakarta-Bandung region of Indonesia, showing how uncontrolled land development and new town development in the perimetropolitan zone has led to huge spatial complexity, severe environmental problems, and increased spatial segregation by income and lifestyle.

“There are various literatures which explore the edges of large urban agglomerations in different parts of the world in ways that are more expansive than a focus only on edge or satellite cities or space economies.”

The spatial edges of African cities have received some attention in recent literatures. The recent turn has gone beyond the established literature on rural–urban transitions and interfaces reviewed by Mbiba and Huchzermeyer (2002). Doan and Oduro (2012) write, for example, of the expansion of Accra in Ghana, showing the spatial complexities of this development, with a mix of concentric expansion, growth of old villages, radial expansion along transport axes, and new development nodes. Simon et al. (2004) consider the city of Kumasi in Ghana, exploring the processes through which traditional villages were incorporated into the metropolitan system, while Jenkins (2003, 2013) uses the case of Maputo in Mozambique to reveal the complex intersections between the formal and the informal in the shaping of home space, including on the spatial peripheries of the city.

There is an eclectic mix of work on the spatial edges of some South African cities. In early work Hart and Partridge (1966) defined an ‘outer residential zone’ for the Pretoria–Witwatersrand–Vereeniging (PWV) region, the progenitor to the GCR, while Geyer (1989, 1996) and Geyer et al. (2012) have described decentralisation trends from the metropolitan core to the ‘metropolitan fringes’. Much of the literature on the perimetropolitan zones in South African cities has emerged, however, from a critique of the apartheid industrial decentralisation programme, and of the South African phenomenon of ‘displaced urbanisation’¹⁵ (for example, Dewar et al., 1986; Wellings and Black, 1986; Murray, 1987; Meth, 1998).¹⁶

The Global Suburbanisms programme housed at York University¹⁷ has added significantly to the literature on processes occurring beyond the traditional boundaries of cities.¹⁸ The writings bring together various different contexts. Addie and Keil (2015), for example, drawing on work from Canada, argue that we should explore suburbanisms through

the *real existing* forms and, especially, through the lived experience of these forms, rather than through normative and ideological debates. Wu (2016) explores emerging Chinese cities beyond the historical urban core, which are driven by a collusion between developers and local authorities, eager to raise finance from land transactions. Wu shows how these new cities on the edge take diverse forms that are not easily represented through the lens of existing Western urban scholarship. Gilbert and De Jong (2015) explore the edges of Mexico City, where most of the growth has happened since 2000. They show how the increasingly dominant informal processes are not a vestige of formal development, but are the product of a complex entanglement of governance practices, land privatisation and regularisation, and urban infrastructure and services deficits. The significance of governance to local outcomes is taken up in a number of other contributions, which have shown that governance arrangements are often more fragmented, complex and poorly developed in the core, with severe implications for the management of environmental, social and economic processes (for example, Peck, 2011; Ekers et al., 2012; Hamel and Keil, 2015).

Southern African scholarship has contributed importantly to the global suburbanism literature. Mabin et al. (2013) argue that much of the new development in Africa’s cities is, in fact, happening on the spatial edges of the urban agglomerations, although the form taken by this development is diverse, including the emerging spaces of upper-, middle-, and low-income, formality and informality. Todes (2014) explores the growth of the northern edge of the Durban metropolitan region, showing how outcomes are a product of the complex intersection between multiple actors, including the municipality, landowners and developers. Buire (2014) extends these

15. This displacement was a result of the ways in which the apartheid government moved communities into homelands but within extended commuting range of metropolitan centres.

16. Beyond this, for the GCR there are various studies of specific localities across time including, for example, Rogerson (1974) on Babelegi; Rogerson (1990), and Kesting and Westcott (2009), on the development of Sun City; Crankshaw (1996) on the township of Bekkersdal outside the mining town of Westonaria; Rogerson (2007) on tourist development in the Magaliesberg; Booysens and Visser (2010) on the growth of the small town of Parys and Van Eeden (1992; 2010a) on the decline of the mining town of Carletonville.

17. For a link to the programme see <http://suburbs.apps01.yorku.ca/dissemination/publications/>

18. Note that the term ‘suburbanism’ does not refer mainly to traditional ‘suburbs’ but rather to new processes of suburbanism that may extend far beyond the boundaries of traditional cities.

arguments by showing how different combinations of private and public actors in the development of Africa's suburbanisms are producing varied spatial forms, governance arrangements, and lived experiences.

Summary

The literatures are diverse, and make variant contributions. The recent critiques of classical agglomeration theories, for example, draw us towards a complex understanding of how the benefits of 'nearness' and 'farness' interact within different industries and places to produce the changing spatial patterns that we observe. Edge city literature may not be directly relevant to the context we are exploring, but it does rather forcefully challenge the view that the edges are necessarily peripheral in economic terms. The satellite city literature focuses

more on state-initiated developments beyond the core city, and shows how uncertain and elusive intentions to achieve these forms of development often are. Literature on space economies and spatial restructuring reveals the ways in which powerful shaping forces are transmitted into localities, but also how governance and local organisation and relationships many influence these outcomes. Finally, the growing literature on peripheries and suburbanisms reveals an extraordinary diversity of economic, spatial, social and governance processes along the edges of large metropolitan agglomerations, and directs us to a study of the details of what is actually happening.

With these insights, we now move to the specificities of what is happening in the GCR, beginning with the broad, contextualising historical overview.

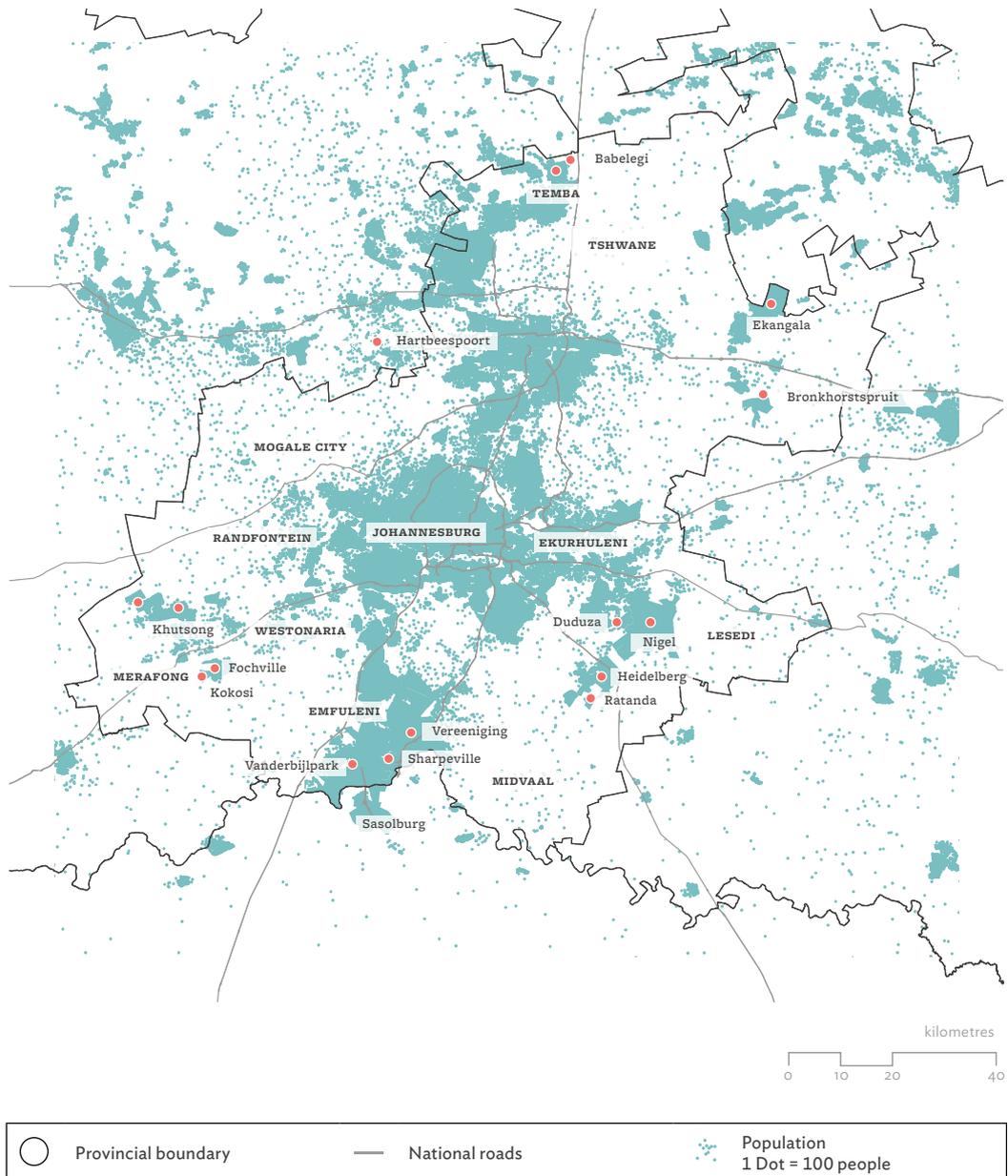


Photograph by Clive Hassall

Figure 72: The GCR and its sprawling edge

MAP PREPARED BY Miriam Maina

SOURCE: Census 2011



1.3 A history of the edge

Nineteenth-century origins and mining-produced polycentrism

Until the discovery of an outcrop of Main Reef in present-day Johannesburg in 1886, the region had an agrarian economy and consisted of scattered indigenous and Boer settlements. Pretoria was the centre of government and was gradually developing into an urban centre of some significance. Potchefstroom was the site of the *Universiteit vir Christelike Hoër Onderwys* (University for Christian Higher Education), but beyond this there only was a scattered network of *dorps* (or rural hamlets) including Rustenburg, Krugersdorp, Magaliesburg, Koster, Heidelberg, Meyerton and Bronkhorstspuit, and traditional villages in the shrinking 'native reserves'.

The gold strike of 1886 led to the emergence of a large-scale urban agglomeration, with Johannesburg at its core, although the story was never just about Johannesburg. All along the linear (or semi-circular) line of the reef, urban settlements developed to service gold mines. Some of these became small cities (for example, Benoni, Boksburg, Germiston, and Springs). Beyond the gold fields were the coal fields and the small towns set up to service those mines. Witbank, for example, was established in 1890.

By the end of the nineteenth century, the outlines of the road and rail system that was to structure development for more than a century was also in place. This reinforced the east-west trajectory of development along the Witwatersrand but also opened opportunities for development to the south, north, east and west of the emergent core.

1900 to the 1940s: Mining, infrastructure, and state-led industrialisation

Mining continued to drive changes in spatial form during this period. Cullinan developed as a small mining town to the east of Pretoria after the discovery of a diamond-bearing kimberlite pipe in 1902. In 1924, the platinum-bearing Merensky Reef was discovered, with the first two platinum mines near Rustenburg opening in 1929. Gold remained the major factor in this period, however. Gold mining

extended outwards along the Witwatersrand through the first half of the twentieth century, with the rapid development of the Far East Rand in the 1930s, and the opening of the first mines on the Wits West Line in the 1940s, with the establishment of Carletonville to service these mines.

Coal mining played a role in the development of an industrial hub on the Vaal River, south of Johannesburg, but there were other key factors, most notably the entrepreneurial skills of the Lithuanian immigrant, Sammy Marks, and the benefaction he received from the succession of Boer, British and Union governments. The little town of Vereeniging was established in 1892 at the point where the railway line from the Cape to the Witwatersrand crossed the Vaal River. In 1911, Marks established the Union Steel Corporation (USCO) in Vereeniging, building South Africa's first steel-making plant. In 1927, the town became the corporate headquarters and steel-making production site of the firm Stewarts & Lloyds, and in the 1930s, a number of downstream industries established around these two plants.

The state also recognised the strategic importance of steel-making and set up the Iron and Steel Corporation (IsCOR) in 1928. The first IsCOR plant was opened in Pretoria West in 1934 but with the surge in demand for steel for domestic and military purposes during World War II, a new site was established on the Vaal River. A specialist steel plant, mainly for war production, was opened in 1944, and after the war, construction began on a fully-integrated steel mill, with the town of Vanderbijlpark established by 1949 to service the plant.

The emergent electricity-generating industry, largely dependent on coal, also stimulated growth on the edges of the growing metropolitan city. Initially, electricity was privately generated (by the Victoria Falls Power Company) with a coal-fired power station near Vereeniging. In 1923, the state-owned Electricity Supply Commission (Eskom) was founded, and in the 1940s Eskom bought out the Victoria Falls Power Company, and began work on a national grid. The role of the state in developing new dams for domestic water supply, and for irrigated agriculture, was also important in shaping patterns of regional development. The Vaal Barrage, completed in 1922, was critical to the expansion of steel-making around



Photograph by Clive Hassall

Vereeniging, but it was the development of the Vaal Dam in the 1930s that created a new recreational hub in the south. The completion of Hartbeespoort Dam and its related irrigation schemes to the west of Pretoria in the 1920s, also led to recreational and tourist-related development in the region, and to the development of Brits as a new agricultural service centre.

By the 1930s, the outlines of a metropolitan region were becoming apparent (Mabin, 2013). Johannesburg received city status in 1927, and Pretoria in 1931, and there was also a linear band of towns and cities strung out along the Witwatersrand. As a metropolitan city emerged, so did a perimetropolitan belt, including,

at the time, the small towns between Johannesburg and Pretoria; the mining settlements on the East and West Rand; and the emergent industrial town of Vereeniging.

Overall, in this period, mining dominated the (non agriculture-related) development of areas beyond the incipient metropolitan core, although there was an expanding hub of industrial development in and around Vereeniging. Industry became increasingly important during World War II, as the government pursued import substituting policies, with national government becoming increasingly involved in the production of strategic commodities such as steel and electricity.¹⁹

19. The government, led by General Jan Smuts, was cautious about intervening too directly in the economy, and it was only after the 1948 victory of the National Party that there was a major thrust in terms of state-led industrialisation, with significant consequences for the metropolitan edge.

1950s–1970s: State-directed manufacturing and large-scale growth on the edge

Gold mining continued to expand through to the end of the 1970s, but within the city-region its spatial footprint was long-since established. The major new expansions were well to the south, around Welkom in the Orange Free State, and into what is now the North West. On the Far East Rand, mines were already ageing, and some closed in the 1960s. There was, however, modest success with replacement industries including, for example, a large rail locomotive plant in Nigel, established by an Australian company in the late 1950s, and a large tobacco manufacturing plant in Heidelberg, in the 1970s.

The expansion in mining continued nearly unabated on the western edge of the Witwatersrand, with the additional production of uranium from the early 1950s to service the expanding nuclear industry in the United States and Western Europe. Carletonville, for example, was one of the fastest growing towns until 1964 when a massive sinkhole swallowed a number of houses and damaged confidence in the area. The West Rand never industrialised in the way the East Rand did. The 1970s brought expansion along the Platinum Belt to the north-west of the urban agglomeration as platinum-based catalytic converters were introduced globally into the automobile industry. New mines were opened and population growth around Rustenburg peaked at 16 per cent per annum in 1973/74.

The major industrial developments on the metropolitan edge happened in the Vaal Triangle. The Iscor plant in Vanderbijlpark opened in 1952 and continued expanding through the 1950s and 1960s. The South African Coal, Oil and Gas Corporation (Sasol) was incorporated as a state-owned company

in 1950, and developed its first synfuel (oil-from-coal) plant, building the town of Sasolburg, and the township of Zamdela, to house white and African workers, respectively. In the early 1970s, there was a major expansion of the emergent petrochemicals complex, with the opening of the Natref Refinery in Sasolburg.

Also in the 1970s, Sasol located its second and third synfuel plants on the present day Mpumalanga highveld, establishing the town of Secunda, 120 km south-east of Johannesburg. This reinforced the development of the eastern highveld complex as the second agglomeration of coal mining, energy generation, metal production, and petrochemicals. Witbank was marketed as the “Ruhr of South Africa” (Johannesburg City Council, 1956: 392) and in 1965 a large stainless steel plant, Columbus Steel, was located in Middelburg.

By the 1960s, apartheid was in full swing, and Prime Minister H.F. Verwoerd was implementing his plan to create independent homelands for each black ethnic group. The homelands closest to the city-region were to the north of Pretoria, the most significant of which was Bophuthatswana, established as the Tswana Territorial Authority in 1961. There were large-scale relocations of individuals and households living in and around Pretoria to newly-established townships behind the homeland border, including Mabopane, established in 1963, Ga-Rankuwa in 1965, and Soshanguve in 1974. These settlements, extending northwards into the semi-rural villages of the Winterveldt, created a major new agglomeration of settlements on the urban edge. A second agglomeration emerged along the N1 freeway north of Pretoria, around the townships of Temba, Kudube and Hammanskraal. These were displaced urban settlements, serving as long-distance commuting satellites of Pretoria,

“By the 1930s, the outlines of a metropolitan region were becoming apparent (Mabin, 2013). Johannesburg received city status in 1927, and Pretoria in 1931, and there was also a linear band of towns and cities strung out along the Witwatersrand.”



Photograph by Clive Hassall

and contributing to the extreme fragmentation of the metropolitan region. The other homeland on the edges of the city-region was KwaNdebele, established as the South Ndebele Territorial Authority in 1977. The township of Ekangala was established 20 km north of Bronkhorstspuit, for incorporation into the homeland.

From around 1960, the apartheid government attempted to grow industrial employment along the borders of the homelands and, after 1968, *within* the homelands. The Rosslyn industrial estate, just beyond the boundaries of Pretoria, was developed to support the Mabopane-GaRankuwa-Soshanguve complex, with some decentralised industry also in nearby Brits where Alfa Romeo manufactured cars from 1974 to 1985. In the 1960s, Datsun and Fiat opened small manufacturing plants in Rosslyn, with a South African company, Praetor Monteerders, starting vehicle production in 1968. Babelagi, established adjacent to Hammanskraal-Temba in 1970, was the first industrial development point within a homeland. It proved to be quite successful, eventually peaking in the early 1990s at an employment level of 17 000.

In 1976, a year before Bophuthatswana's pseudo-independence, the casino magnate, Sol Kerzner, made a deal with the chief minister of Bophuthatswana, Lucas Mangope, to establish Sun City, north-west of Rustenburg. It opened in 1979, and became a place of fantasy and escapism for the white residents of Pretoria and the Witwatersrand during the late apartheid years. The Pilanesberg Game Reserve was established in the homeland immediately adjacent to Sun City.

1980s to mid 1990s: State retreat and a fitful decline

The gold mining industry began its long decline in the 1980s as the gold price levelled and production costs continued to increase. Mining-dominated towns such as Carletonville and Klerksdorp stagnated or declined. The platinum industry continued its roller-coaster ride through this period. There was a dramatic collapse of the platinum price in the early 1980s (from \$1 070 per gram in 1980 to \$274 in 1982) and the industry battled to recover through the decade and into the early 1990s. The development around Rustenburg continued but vacillated.

Manufacturing centres also suffered as local markets faltered during the economically stagnant 1980s, and as global competition in the 1990s left inefficient industries unprotected. The East Rand lost manufacturing employment through the 1980s to the mid-1990s, with the more peripheral Far East Rand disproportionately affected.

From the 1980s, the state began its retreat from direct involvement in industry, with mixed outcomes. In 1979, Sasol was privatised, and the company went global, entering into joint venture partnerships in countries across the world, but it continued to expand production of petrochemicals, and downstream chemicals in Sasolburg and Secunda. Iscor was privatised in 1989, but it had a more troubled experience than Sasol as it was a highly inefficient producer in global terms, and struggled to survive without state protection. Between 1994 and 2001, Iscor embarked on a major restructuring process, which resulted in its national workforce reducing dramatically from 44 000 to 12 200. The Vereeniging-Vanderbijlpark complex, including townships such



as Sebokeng and Sharpeville, was badly affected, with employment decline and the loss of consumer income.

In the 1980s, South Africa's industrial decentralisation programme was strengthened with expanded incentives and a new emphasis on *deconcentration points* – those on the edge of metropolitan areas rather than in remote locations. This favoured the peripheries of the present-day Gauteng region. In 1984, the Ekandustria growth point was established between Ekangala and Bronkhorstspuit, to support the KwaNdebele homeland. It did relatively well, attracting a growing number of Taiwanese investors, and peaked at an employment level of around 10 000 in the early 1990s. Babelagi continued to expand, with employment reaching around 17 000. Rosslyn was doing well. By 1975, BMW had full ownership of the Praetor Monteerders plant and was developing the factory as its only production site outside of Europe.

Overall, there was a mixed bag of outcomes for the edges of the GCR during the 1970s and 1980s, but the growth momentum of the earlier decades had mainly been lost. In the early 1990s, however, political changes were looming, and these would impact sharply on geographies established under apartheid rule.

Mid-1990s to the present: The core consolidates, or new beginnings for the edge?

The year 1994 marked the dawn of democracy in South Africa. There was new hope for South Africa's previously marginalised majority, but the economic

benefits of political change were spatially variant. Overall, the GCR benefitted with higher levels of economic growth and in-migration than other parts of the country. Within the GCR, however, there was considerable variation. The core metropolitan cities performed best, with Simkins (2010: 11) writing that the "long decline of the Centre has been reversed". On the spatial edges of the GCR, the economy was most fragile, largely as a result of the decline of gold mining, and the troubles in the steel-making industry.

Gold mining continued to contract, and the economies on the edge of Gauteng still heavily dependent on this industry experienced dire times. The West Rand was most affected as its economy was far less diversified than the East Rand. The platinum industry, by contrast, experienced rapid and sustained growth in this period, with Rustenburg emerging as one of South Africa's secondary cities, and smaller centres like Brits also growing. The expansion was, however, not well managed, and social tensions grew, culminating tragically in the Marikana killings of 2012. Since then, global platinum prices have declined and the social crisis on the Platinum Belt has deepened.

Industrial growth points in the homelands were negatively affected, economically, by political changes. Incentives were withdrawn, and tariff protection reduced, and most industries in these places closed or relocated. However, unlike growth points in more remote localities, there was wind-down rather than collapse. The industrial complex in the Vaal remained troubled. Iscor was taken over by global steel giant, ArcelorMittal, in 2004, and for a while, there were promising signs of growth. The 2008 global financial

crisis was, however, a major blow. Markets did recover, but from around 2014, the steel industry, both globally and in South Africa, plunged into an unprecedented crisis. The catalyst was the sharp contraction in the construction industry in China, also the world's largest steel producer. With shrinking local demand, Chinese producers turned to export markets to sell off surplus production. Markets in the USA, the UK and South Africa, among others, were flooded with cheap imports, making local industries increasingly non-viable. In South Africa, ArcelorMittal threatened to close its steel plant in Vanderbijlpark, but a deal was reached with the South African government over the reimposition of import tariffs. Global steel markets remain extremely unsettled and there is continued uncertainty over the future of the steel-making complex in the Vaal. Across the Vaal River, however, Sasolburg continues to do well, with increasing investment in petrochemical production, despite depressed global oil prices.

The 2011 census confirmed that growth in Gauteng was consolidating in the core, with the major exceptions of Sasolburg and the Platinum Belt (prior to 2012). The overall narrative seems to be one of a declining perimetropolitan belt, but there are signs of some revival in manufacturing in peripheral locations. Among the major new investments since 2010 are: Nestlé's two new factories in Babelegi; the Consol Glass factory in Nigel; the fluorspar beneficiation plant near Bronkhorstspruit; Tata's new bus and truck assembly plant in Rosslyn; Samancor's manganese beneficiation plant at Meyerton, near Vereeniging; the Heineken brewery at Walkerville in the Midvaal local municipality; and the new ethylene purification unit in Sasolburg. Edge locations are apparently benefitting from a growing shortage of land, and rising costs, in the metropolitan core, but also from

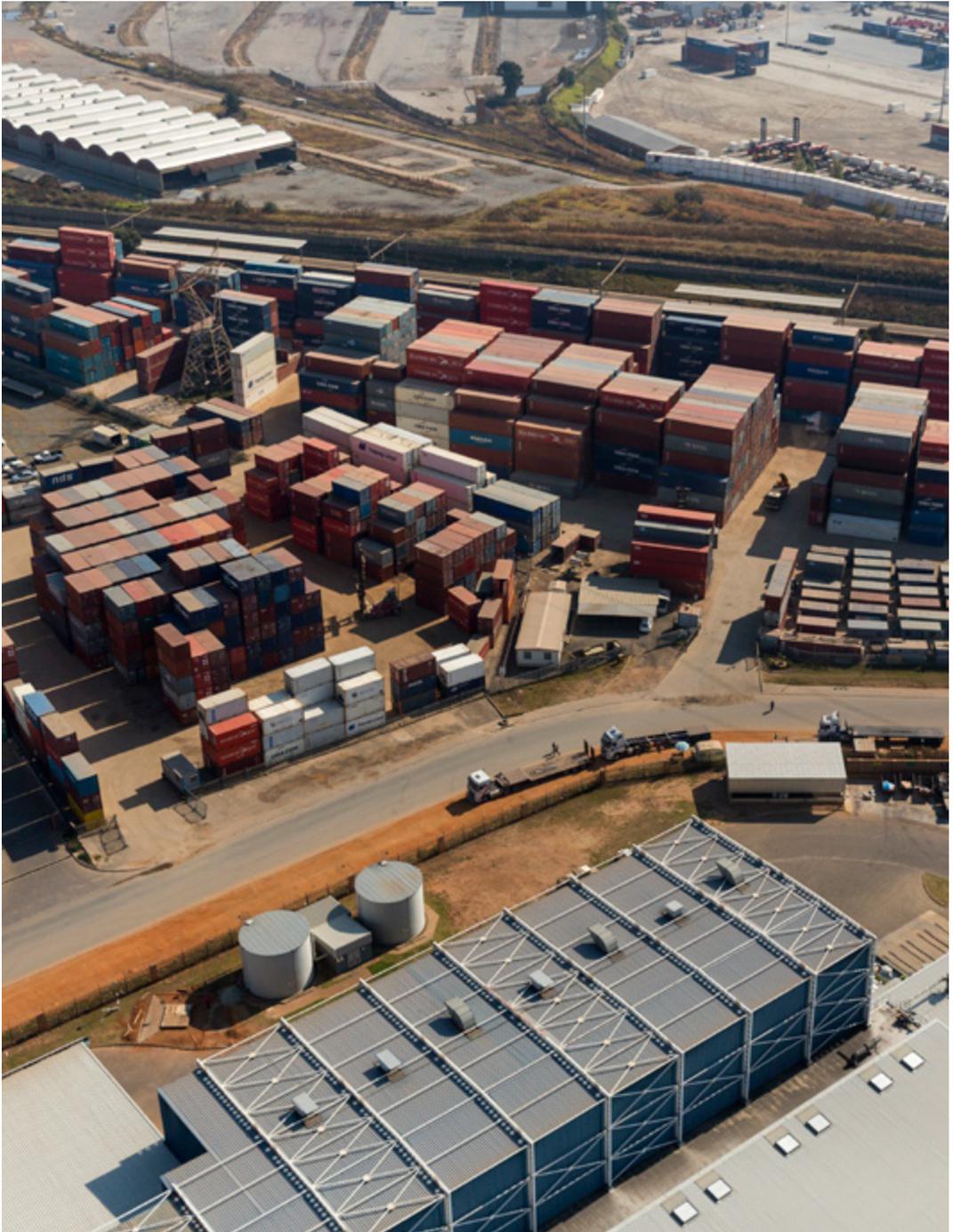
institutional improvements such as the incorporation of these places into metropolitan authorities, and new forms of support from national government. The Department of Trade and Industry (DTI) introduced a (Section 121) Tax Allowance Incentive in 2010, and this has been significant in a number of recent locational decisions,²⁰ with a clear benefit also from the Mining and Minerals Beneficiation Programme of the Industrial Development Corporation (IDC).

The growth has not only been in manufacturing, however. The property boom from the late 1990s until 2008 led to a splurge in second-home developments and lifestyle estates in recreational spots such as the Vaal Dam and Hartbeespoort Dam. The 2008 downturn brought the property boom to an end, although there has been modest recovery, and also area-specific growth, such as around Bronkhorstspruit where the construction of the Kusile Power Station has produced a local boom. There has also been a recent wave of large-scale retail development, with a new trend towards shopping malls outside the market-saturated metropolitan core.²¹

A key question is whether these incipient dynamics of growth within the perimetropolitan belt will coalesce into developments of significant scale to shift the overall distribution of economic activity within the GCR, or whether they will remain minor counter-currents in the face of an overarching tendency towards further concentration in the core. A new dynamic in the ongoing process of perimetropolitan development is the development vision of the provincial premier, David Makhura. The premier has spoken of development corridors extending to the edges of the province "encompassing new industries, new economic nodes and new cities" (Makhura, 2015).

20. The selected projects are within the priority sectors identified in the Industrial Policy Action Plan (IPAP) – eighteen of the projects are in the chemical sector, six in the cement and ceramics sector, and three in the wood, paper and pulp sector. See https://www.thedti.gov.za/financial_assistance/

21. The Vaal Mall was opened in Vanderbijlpark in 2006 and the Highveld Mall in 2007. Further developments were interrupted by the 2008 downturn, but from 2012, a new rush of developments was seen. The Middelburg Mall opened in 2012, as did the Boitekong Mall between Rustenburg and Sun City. In 2013, there was a significant expansion to the Vaal Mall, as well as the opening of the Tower Mall in Klerksdorp and the Cradlestone Mall in the Cradle of Humankind, north-west of Johannesburg.



Photograph by Clive Hassall

2. Stories of extractive economies

2.1 The context of mining

The Witwatersrand is unusual in terms of the enormous significance of extractive industry in the initial shaping of the economy and the spatial structure, and of the continued significance of mining in parts of the region. The peculiarity of mining is that it can never be a permanent activity. In broad terms, a mining cycle involves: prospecting and discovery; investment in the mining infrastructure; a growth period as extraction increases; a downward cycle; and, eventual closure. There may, however, be multiple sub-cycles linked to the fluctuation of commodity prices.

The sustainability of mining settlements is currently an area of considerable international concern. During the global commodities boom (2000–2008), mining was a major growth sector and the focus of international literature was largely on the impacts of mining on the *growth* of settlements. Bryceson and MacKinnon (2012), for example, report on an extensive investigation into mining, urbanisation and welfare across Africa, emphasising growth (although there is reference to boom-bust cycles and the uncertainties of commodity markets). Currently, however, the concern is more about the effects of *decline*. There is a growing literature in China, for example, on sustainability threats to mining cities (for example, Li et al., 2009; Li et al., 2015). Martinez-Fernandez et al. (2012) compare shrinking mining cities in Australia, Canada, Japan and Mexico, while recent media reports point to current concerns in Australia over the future of mining towns in the aftermath of the recent commodities boom (Lorkin, 2015).

The South African case is somewhat different to many contexts internationally, as mining has been well established for over a century, and there has been a slow trajectory of decline for over three decades, especially in the gold-mining sector. South Africa did not generally benefit from the recent commodities boom (with platinum, iron, and coal, as partial exceptions) and the concern with the declining mining sector's effect on towns and cities goes back some time. Nel and Binns (2002), for example, wrote of the effects of the decline in gold mining on the small city of Welkom, and a number of subsequent studies take up this theme in investigating the effects of mining closures on communities and settlements, and also responses to closures through local economic development strategies (Binns and Nel, 2003; Rogerson, 2011, 2012; Lochner, 2013; Lochner and Cloete, 2013).

The literatures grapple with the tough challenges as localities dependent on mining are extremely vulnerable to forces far beyond their control, including, most importantly, commodity prices and the strategies of mining companies, which are often headquartered in distant locations. There are some insights of value. Freudenburg and Frickel (1994) do not support the polarised positions in which mining is either an unalloyed blessing or the source of long-term underdevelopment of a local economy. They show that “outcomes appear to have reflected intersecting configurations of physical resource characteristics, the organizational form/scale of extractive activities, the historical period in question,

“South Africa did not generally benefit from the recent commodities boom and the concern with the declining mining sector’s effect on towns and cities goes back some time.”



Photograph by Clive Hassall

and the nature of relationships among competing resource uses and users” (Freudenburg and Frickel, 1994: 266). Martinez-Fernandez et al. (2012) show how the strategies of the dominant mining corporations in relation to the ebbs and flows of international commodity markets dominate the prospects of each city. Feagin (1990) argues that the historical timing of events such as oil and mineral discoveries are critical to economic prospects.

South African literature contributes to a policy debate on how to respond to the decline of mining. The literature argues for the importance of economic diversification, but Pelsler et al. (2012) distinguish between ‘vertical diversification’ which happens when the local economy expands to provide services and products for mining, and ‘horizontal diversification’ which happens when new economic activity emerges that is different to, and independent of, mining. It is this latter form that is of greatest value to a local economy. Pelsler et al. (2012) advise that strategies

to diversify must be pursued well in advance of mine closures, preferably at the peak of a mining cycle when economic resources to support alternative industries may be plentiful. Various writers have emphasised the importance of supporting local entrepreneurs and SMMEs in mining areas, but Seidman (1993) argues that local entrepreneurialism may take a long time to bear fruit, and in some cases, large-scale investment supporting large-scale job creation may be needed to forestall economic disaster.

In the sections below, Carletonville is an illustrative example of a local economy that remains overwhelmingly dominated by mining, and has largely failed to diversify. The Nigel-Heidelberg district is used to illustrate relative success in transcending the boom-bust trajectory of the mining cycle. These are medium-sized towns, largely peripheral to the GCR, but they have survived beyond mining. Heidelberg’s success offers insight into another form of primary economic activity, agriculture.

2.2 The Carletonville story

Introducing the area

Carletonville is on the Far West Rand, within the Province of Gauteng (although an earlier attempt by government to transfer Khutsong township in North West Province failed). It falls within the jurisdiction of the Merafong Local Municipality and the West Rand District Municipality. It is a gold and uranium-mining area, with the world's deepest mines, and a GVA in 2013 of R13.7 billion (Quantec, 2015). Carletonville is 77 km from Johannesburg and is accessible by a provincial road, the R501. It is at the far end of Gauteng's commuter rail network, but the freight rail network to Carletonville has been decommissioned.

The historical focus of settlement is the town of Carletonville, although Khutsong township, north-west of the town, has a population almost three times greater. Immediately south of Carletonville is the mining belt, with the shafts and tailings dams and dumps of Western Deep Levels and Blyvooruitzicht, and scattered settlements including mine compounds, informal settlements,

and laid-out mining villages for mine managers and skilled workers. South of the mining belt is the small town of Fochville and the neighbouring township of Kokosi.

The population of the area in 2011 was 197 520, which was 6.2 per cent less than the 210 683 in 2001, reflecting the effects of the declining mining economy. The main concentrations of people in 2011 were in Khutsong township (62 456), Kokosi township (26 403) and Carletonville (22 988) (Statistics South Africa (Stats SA), 2015).

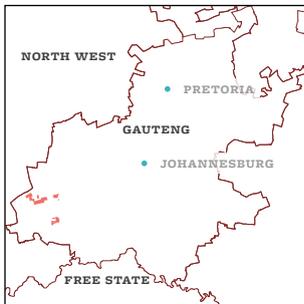
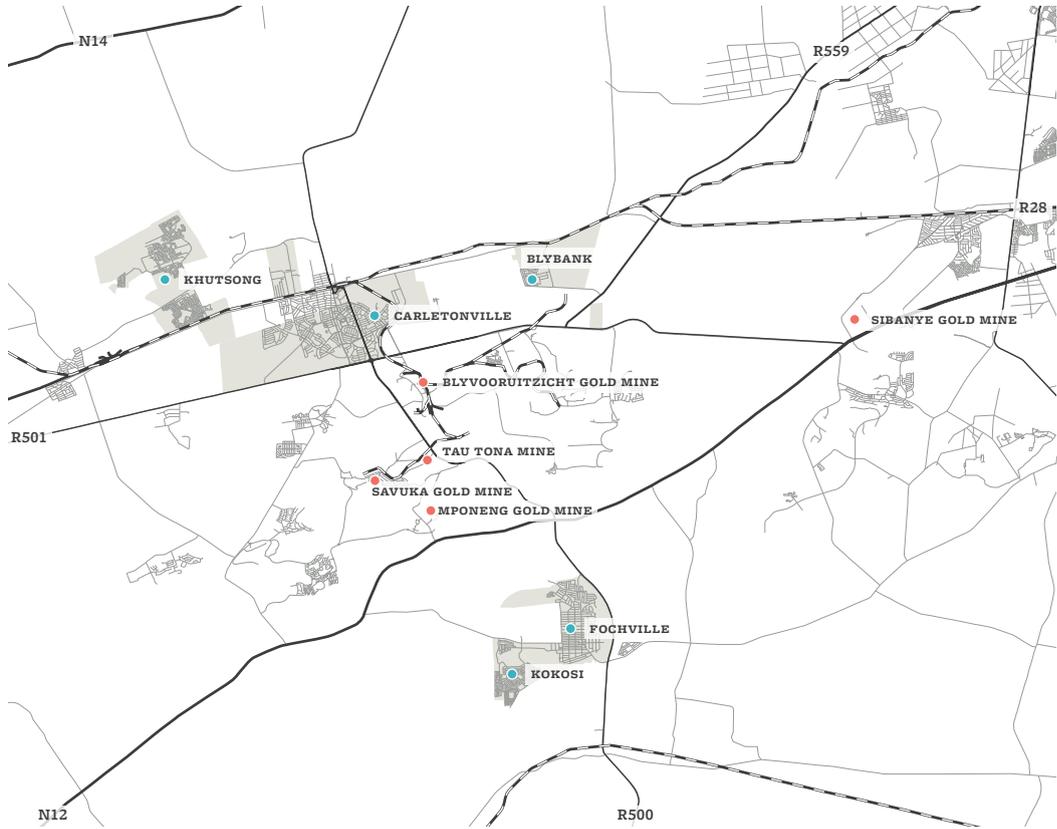
Fortunately, we do know quite a lot about Carletonville, not least because of the ongoing work of Professor Elize van Eeden of North West University (for example, Van Eeden 1992, 2010a, 2010b). The story is, however, a sobering one. It tells of an area which enjoyed great prosperity during the boom years of the gold mining industry, but which largely failed to diversify its economy and find a sustainable path into the future. The story has, however, not yet ended, and there are still possibilities for new economies to emerge.



Photograph by Brian Boshoff

Figure 73: Locating greater Carletonville

MAP PREPARED BY Miriam Maina



‘Happy prospect’ – beginnings, to the early 1960s

In the early twentieth century, this area was a remote and sparsely-populated outpost of the Witwatersrand, best known for heavy skirmishes during the South African War (1899–1902), although the extensive ruins of pre-colonial settlements suggest that it was once a hub of human activity. It was only in 1920 that Fochville, named after an American war hero, was proclaimed as the first formal settlement in the district, serving a small agricultural sector (Van Eeden, 1998).

The bustle of gold mining was far to the east. It was believed at the time that the gold-bearing reef ended near Randfontein. However, Guy Carleton Jones, the Canadian who worked as chief engineer for Cecil Rhodes’ old company, Gold Fields, was not convinced. He recruited a German geophysicist and together they traced a line of magnetic shales associated with the gold-bearing rock, deep under the earth, which became known as the Wits West Line. Boreholes confirmed the passage of the Main Reef, and New Consolidated Gold Fields Ltd was established, with ambitions of opening six large mines in the district (Van Eeden, 1998).



Photograph by Brian Boshoff (Mining landscapes around Carletonville)

The 1930s and 1940s was a frenzy of activity as exploration was followed by the development of the new mines. It was arguably the most important development in South Africa’s gold mining history, since the discovery of the Main Reef in present day Johannesburg, in 1886. Blyvooruitzicht (meaning ‘happy prospect’) mine was established in 1937 as one of the world’s largest gold mines, followed in 1945 by West Driefontein, and Doornfontein in 1947, also both

mega-mines. In the late 1940s, South Africa entered into agreements with the United States and Great Britain to supply uranium to their growing nuclear industries, and the production of uranium along the Wits West Line from 1953 added impetus to the mining industry (Van Eeden, 1992).

There were challenges, however, as the mines were frequently flooded by large volumes of water from dolomitic karst aquifers. The mining companies were

“By the early 1960s, the mines in the area were doing spectacularly well. West Driefontein, for example, was rated as the largest gold mine in the world by 1964, producing around 63 000 kg of gold annually..”

eventually given permission by government to dewater the dolomitic compartments, leading to easier mining conditions, but also to a reduction in groundwater levels of up to 1 000 m, with severely detrimental effects on local agriculture. Government was forced to mediate as tensions flared between mining companies and farmers (Van Eeden, 1992; Winde and Stoch, 2010).

African workers were housed in compounds, and white managers and workers in scattered mining villages.²² In 1948, however, the town of Carletonville, named after Guy Carleton Jones, was established by Gold Fields Ltd. White settlement in the area consolidated quite quickly in Carletonville, and in 1959 the settlement was proclaimed as a town and granted independence of the mining company. By the 1950s, there was an influx of African work seekers, and the authorities identified squatting on farms as a growing problem. In 1959, Khutsong was proclaimed as a township for Africans who lived outside the mine compounds (Van Eeden, 1992).

By the early 1960s, the mines in the area were doing spectacularly well. West Driefontein, for example, was rated as the largest gold mine in the world by 1964, producing around 63 000 kg of gold annually (or two million fine ounces). There were also some signs of activity in manufacturing with a handful of light industries, mainly in metals and engineering, locating in Carletonville in support of the mining industry. In the early 1960s, Carletonville was said to be the fastest growing town in South Africa, with a population approaching 50 000. It was marketed as the ‘Jewel of the West Rand’, a new and modern town. There was even media speculation that Carletonville would grow into a large city (Van Eeden, 1992).

Disaster and its aftermath: 3 August 1964 to the end of the 1960s

There was a tragedy in the making. The de-watering of the dolomitic compartments from the 1940s had created serious geological instability and, from the early 1950s, a growing number of sinkholes occurred. In 1962, a massive sinkhole opened up at the West Driefontein mine, swallowing the crusher and sorting plant, and killing 29 workers. It was, however, a disaster in the town, rather than the tragedy on the mine, which caused the panic. On 3 August 1964, two houses and parts of others vanished down a sinkhole that had suddenly appeared in a suburb of Carletonville, taking with them a family of five (Winde and Stoch, 2010). The municipality immediately froze all new development, and national government even mooted the possibility of evacuating all of Carletonville. In the final event, it was only the small settlement of Bank which was relocated. Its residents, who were mainly of Indian origin, were moved to Lenasia, leaving behind a ghost settlement, and depriving the district of the spending power and entrepreneurialism of this community (Van Eeden, 1992).

Carletonville survived but its growth prospects were severely affected. The mining companies remained committed to the area as there were enormous profits still to be made in the deep level mines. The new Kloof mine, for example, opened in 1968. Other investors, however, kept away, and a labour shortage developed, with managers and workers fearing for their safety. Of the few small industries that had established before 1964, around one-half closed down, and by 1970 only 1 per cent of households in Carletonville were involved in manufacturing activity. This was at the end of a decade when manufacturing had boomed nationally, and when the East Rand had

22. These included West Wits (1937), Oberholzer (1939), Bank (1940), Welverdiend (1942) and Blybank (1947).

“In the 1970s, prosperity returned to Carletonville. With rising gold prices, this was a decade of mining success and growth in the local economy. The actual physical production peaked in the early 1970s when the last of the major new mines opened...”

emerged as South Africa’s ‘industrial workshop’, but, for Carletonville, the disasters of the 1960s had taken an enormous toll, and may have been the primary reason for the town’s failure to diversify economically (Van Eeden, 1992).

Restored prosperity: The 1970s

In the 1970s, prosperity returned to Carletonville. With rising gold prices, this was a decade of mining success and growth in the local economy. The actual physical production peaked in the early 1970s when the last of the major new mines, East Driefontein, opened, but the surging gold price kept the mines highly profitable through the decade.²³ The good fortunes in gold led the growth of the local economy. The Oberholzer census district, of which Carletonville was the largest centre, more than doubled its contribution to the Gross Geographic Product (GDP) of present-day Gauteng, from 3.1 per cent of the total in 1970, to 6.8 per cent in 1981. In proportional terms, by 1980, Oberholzer district had become the fourth largest contributor, of 24 districts, to the economy of present-day Gauteng, following Johannesburg (31 per cent), Pretoria (17 per cent) and Germiston (7.8 per cent) (Simkins, 2010). In 1976, there was again speculation in the media that Carletonville might develop in the future as a new city (Van Eeden, 1992).

Carletonville was clearly growing but its economy was mono-sectoral. In 1972, mining accounted

for 92.7 per cent of GDP, followed at an extreme distance by retail at 5.1 per cent, and by the end of the decade mining was even more dominant because of its rapid growth. Unlike the East Rand, which was diversifying quickly, the Far West Rand was still extremely vulnerable economically (Simkins, 2010). Industrial development remained marginal to the local economy, with labour participation in manufacturing increasing only slightly from 1 per cent to 2.6 per cent. Local actors, hopeful that industry might be located in the town, were disappointed by the National Physical Development Plan (1975), which designated Carletonville as part of the West Transvaal region, excluding it from the proposed industrial areas of the Witwatersrand (Van Eeden, 1992). There was, however, limited growth in retail and services in the 1970s as the state replaced mining companies as a key service provider and opened a police station, hospital and school. Private retailers also arrived with Pick n Pay, for example, opening stores.

The anxiety of the 1980s

The 1980s was a period of consolidation rather than continued growth in mining. The price of gold levelled off, and rising costs put the profit margins of mines under pressure. There were also growing concerns over the future of the mines, with predictions that Blyvooruitzicht mine could close by 1994. Indeed, by the late 1980s, Blyvooruitzicht’s

23. The mines were doing well, notwithstanding a series of complications that included: mass flooding of shafts; a series of mine disasters including one at West Driefontein in 1972 when 175 workers were injured and 17 killed; and growing labour unrest. In September 1973, eleven mineworkers were shot dead by police.



Photograph by Clive Hassall

production was only a fraction of what it had been in 1970, and workers were being retrenched (Van Eeden, 1992).

While mining was under some pressure, it was not yet in crisis. The population of Carletonville continued to grow through the decade at rates higher than that of the region comprising present-day Gauteng (Simkins, 2010). There was, however, a local understanding that this growth was vulnerable and the municipality and local business chambers were eager to promote manufacturing as an alternative to mining. From 1982, the West Rand Regional Planning Committee, including local actors and mining companies, worked to develop a local infrastructure for manufacturing, and to attract industrialists to the area. In 1987, a large industrial park was opened (Van Eeden, 1992).

A major constraint was the lack of support from national government for industrial development in the area. P.W. Botha's 'Good Hope Plan', released in 1981, did in fact recognise Carletonville as part of the Pretoria-Witwatersrand-Vereeniging (PWV) urban complex, but it was a disappointment to local actors as it did not support industrialisation in the area. The government focused on promoting industrial development within and near to African homelands, and Carletonville, some distance from a homeland boundary, was not a favoured location. Also, by the time the industrial infrastructure was in place in the late 1980s, South Africa's economy was in the doldrums and the possibilities of attracting industry

were slim. It did not help that Andries Treurnicht's Conservative Party (CP) captured political control of the locality in the late 1980s. In the 1987 national election, Arrie Paulus, the general secretary of the all-white Mine Workers Union (MWU), was elected to parliament to represent Carletonville, and a year later the CP took control of the municipal council in the context of a bitter struggle by white mineworkers to maintain their privileges in the face of a resurgent African trade union movement.²⁴ When the CP-dominated local council put up 'Whites Only' signs around the town – reintroducing forms of 'petty apartheid' that had disappeared in the 1970s – African consumers reacted by boycotting shops in the town. It was a disaster for the small retail sector and the Carletonville Chamber of Commerce lobbied national government to force the town council to abandon these new restrictions.

Crisis in the 1990s and 2000s

With political changes from 1990, and democracy from 1994, the once-dominant white right wing was marginalised but, tragically, political transformation came together with deepening local economic crisis. In the period 1991–1996, population growth changed suddenly to - 0.77, worsening to - 2.74 for 1996–2001 (Simkins, 2010). This wasn't a sudden economic collapse but it was the beginning of a protracted and painful decline, with many dimensions including economic, social and environmental.

24. The newly formed National Union of Mineworkers (NUM) was especially active in Carletonville, the home of its founder and president, Elijah Barayi.

The economic crisis was, of course, the consequence of the gradual decline in gold mining. The mines in the area consolidated under the four largest mining companies in South Africa: Durban Roodepoort Deep (DRD Gold); Gold Fields Ltd; Harmony Gold; and AngloGold Ashanti. These companies strategised to keep the mines profitable. Gold Fields, for example, went through an extended period of phased consolidation, which eventually brought its six mines together into a single operation known as the Kloof-Driefontein Complex (KDC), which still employs around 30 000 workers.²⁵ Gold Fields also went deeper, investing heavily in KDC which, at 4.1 km below the surface, is now the deepest mine in the world, and this shaft sinking may extend the life of the mine to 2035, depending on market conditions (Gold Fields, 2012). AngloGold Ashanti has kept its Savuka, Mponeng and Tau Tona mines in operation, while the Kusasaletu mine near Carletonville is still the largest individual mine owned by Harmony Gold. Production is nevertheless in decline with the Tau Tona mine, for example, reducing from 646 000 ounces of gold in 2002 to 189 000 in 2012.

The tensions after the Marikana massacre of 2012, and the ongoing conflict between NUM and the Association of Mineworkers and Construction Union (AMCU), had repercussions for the Far West Rand. In 2013, Harmony Gold suspended production at Kusasaletu following ongoing strike action, with around 6 200 jobs placed at risk (*Business Day*, 8 January 2013). The major problem, however, was at Blyvooruitzicht. This was an old and declining mine, but there was new hope in 1997 when it was purchased by DRD Gold. The company sold the mine on, however, and there was a series of owners until provisional liquidation in 2013, and retrenchment of the remaining 1 700 workers (*Financial Mail*, 27 March 2014).

The closure of Blyvooruitzicht and the contraction of the other mines had a negative effect on Carletonville and, more especially, on Khutsong and Kokosi, where unemployment levels soared. The population of the district continues to decline,

although many job seekers remain in the area even after their job contracts expire in the hope that new employment will materialise (Anonymous 1 and 2, Personal communication, 2013). The deepening troubles in the mining sector are unfortunately not mitigated to any significant extent by the growth of any other sector, with the possible exception of wholesale and retail. There were belated attempts by mining companies to support the diversification of the local economy. Gold Fields, for example, developed a hydroponic farm producing cut flowers for a global market, with hothouses fed by the warm humid air of mine ventilation shafts. The project employed around 300 people, and although an interesting innovation, it was trivial in relation to the challenge of developing replacement industries for mining (*Engineering News*, 22 August 2002; Creamer, 2008).

Historically, all retail activity in the region, including for Fochville and Khutsong, has been located in the town of Carletonville, despite the fact that Khutsong accommodates the greatest population. The size of wholesale and retail trade in Carletonville gradually trended upwards until the national economic downturn of 2008/09, increasing its proportional contribution to the economy. The situation since 2009 is less clear. Local competition has grown recently, with the development of three neighbourhood suburban retail centres in Fochville, which have drawn the larger chain stores away from the Carletonville CBD, and also from a thriving SMME retail market in the township, run predominantly by Asian and other immigrant traders (Anonymous 1, Personal communication, 2013).²⁶

The overall declining economy has exacerbated social stress and political conflict in the district. A decision by government in 2005 to transfer Khutsong from Gauteng Province to North West Province provoked a local rebellion, with often violent protests continuing until 2008, when the government finally backed down (Kirshner, 2014). Although the demarcation issue was resolved, Khutsong has remained as a place of extreme social stress, with

25. The operation consists of the previous East Driefontein, West Driefontein, Kloof, Venterspost, Libanon and Leeudoorn mines. In 2012, this complex was producing 35 000 kg of gold a year (Gold Fields, 2012).

26. Following retrenchments from the mines, a number of former mine workers have become involved in retail trade rather than returning to rural areas, but the scale of this activity is not clear.



Photograph by Brian Boshoff (A declining mining economy)

high levels of violent crime, including recruitment of school children into gangs and the frequent abduction of young girls. In November 2013, the local community reacted to gang violence with a vigilante group of around 600 people attacking gang members across the township. Five gang members were ‘necklaced’ to death (*City Press*, 5 November 2013; *Mail & Guardian*, 8 November 2013).

Economic problems are compounded by an environmental crisis of considerable proportions – the consequences of more than seventy years of gold and uranium mining. Van Eeden (2010b: 200) describes the Carletonville district as “probably the most dangerous environment in the country”. The environmental crisis is multifaceted. Dolomitic ground collapse risks remain severe, with around 90 per cent of the residents of Khutsong, for example, highly vulnerable. In addition, there is heavy metal and radioactive contamination of the streams,

wetlands and soils. Acid mine drainage decants from numerous streams a potent mix of radioactive waste and other hazardous material, with percolation from tailings dams adding to the concoction (Van Eeden, 2010).²⁷

In 2000, Merafong (‘place of mining’) local municipality was established, which includes the towns of Fochville and Carletonville, and the townships of Khutsong and Kokosi. The local situation was already bleak by then, and the new local authority had an unenviable task. In Jean and John Comaroff’s edited book, *Law and Disorder in the Postcolony*, Carletonville is one of the illustrative localities chosen to depict the violence and disorder characterising many post-colonial contexts. In her contribution to the book, Rosalind Morris writes of sexual violence in Khutsong township (Morris, 2006).

27. Van Eeden (2010) reports on studies that show, for example, that water bodies in the area have uranium concentrations of around 16 mg/l, many times higher than the level of 0.284 mg/l considered by regulatory bodies to be the maximum level for human safety.

Future prospects

Will Carletonville stagger on for another two decades or so and then shut down as the last mines close? Will it then become a ghost town or at least a small remnant of what it once was? These are real prospects, but there is an alternative scenario that may offer some hope. It is possible that improved market conditions and advancing mining technologies will give the mining industry a new lease of life, providing a last opportunity to diversify the local economy by developing replacement industries. There are still vast gold and uranium reserves present at deep levels between Carletonville and Potchefstroom, and with new technologies and favourable market conditions,

mining companies may still invest in the extraction of this resource. If this investment happens, the Gauteng Provincial Government may be able to realise its dream of a Western Development Corridor, founded on industries such as agro-processing and renewable energy production (Makhura, 2015), that extends all the way to Carletonville. However, the dolomitic risks in the Carletonville area remain – in 2015 a large sinkhole appeared in the town underneath a Rand Water pipe, although this time, fortunately, there were no casualties (City of Merafong, 2015).



Photograph by Brian Boshoff (Living in hope: informal settlements around the mines)

“When the mining industry began contracting sharply from the 1990s, the local economy was unprepared and vulnerable. Fortunately, it hasn’t been a case of sudden death, and economic activities, including retail, have survived, but the process has been painful for the many individuals and households geographically bound in some way to Carletonville.”

Conclusion

Carletonville provides a hard lesson. We do not know if the snowballing economic growth in the 1950s and early 1960s could ever have supported a more diversified economy, as happened on the East Rand, for example. Carletonville was more isolated than the East Rand, had infrastructure problems (for example, water shortages and a lack of industrial sites), and had a labour force that was almost entirely migrant and related only to mining. But, the 1964 sinkhole put paid to any real prospect of industrial development, and so Carletonville missed out on South Africa’s manufacturing boom in the mid-to-late 1960s. When the mining industry began contracting sharply from the 1990s, the local economy was unprepared and vulnerable. Fortunately, it hasn’t been a case of sudden death, and economic activities, including retail, have survived, but the process has been painful for the many individuals and households geographically bound in some way to Carletonville.

Did local economic actors try hard enough? It is difficult to say. Did the mining companies play their role in supporting wider economic development? Probably not, but they did participate from time-to-time in local initiatives. The reality is that Carletonville’s economy was not prepared for the long decay of the mining cycle, and its failure to diversify was key. Fortunately, there is nothing inevitable about the future, and a reprieve for Carletonville remains a possibility.

2.3 The story of Nigel-Heidelberg

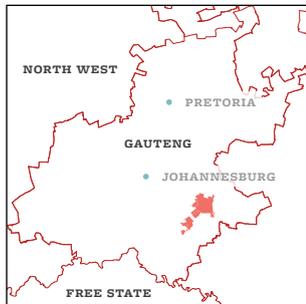
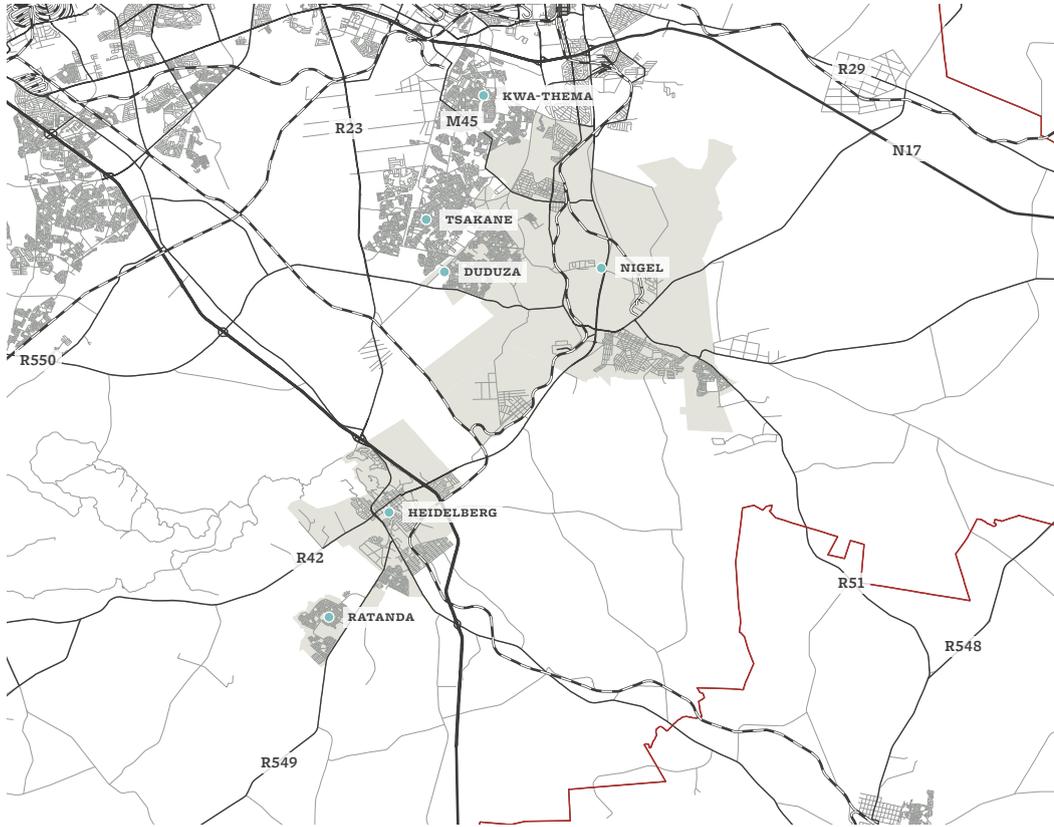
Introducing the area

Nigel is a medium-sized town on the Far East Rand within the jurisdiction of the Ekurhuleni metropolitan council, 53 km from the O.R. Tambo International Airport. About 10 km south-west of Nigel is the town of Heidelberg, which falls within the Lesedi local municipality. Although institutionally divided, these towns share similarities in history, and, at times, they were competitors. Nigel is located at the edge of a large urban agglomeration, whereas Heidelberg is a stand-alone town, although its location on the N3 highway from Johannesburg to Durban is a balancing factor. Both these towns have associated townships with large populations. Duduza, north of Nigel, is linked to a mega township complex which includes Tsakane and KwaThema (although, in this narrative, we deal only with Duduza. The other townships, though spatially-connected to Duduza, are oriented more towards the small Ekurhuleni city of Springs). Ratanda township is located outside Heidelberg. Historically, these towns serviced gold mining and agriculture, but there is also a modestly-sized manufacturing (agro-processing) industry. In 2013, the GVA of the area was approximately R10.8 billion, somewhat smaller than that of Carletonville (Quantec, 2015).

In 2011, the population of the area was 183 280, 19.6 per cent higher than the 2001 population of 153 154. This was a very modest increase, reflecting the subdued growth of the area during that time. The major concentrations of people in 2011 were in Duduza (73 297), Nigel (38 219), Ratanda (36 098) and Heidelberg (35 566).

Figure 74: Locating the Nigel-Duduza-Heidelberg-Ratanda complex

MAP PREPARED BY Miriam Maina





Photograph by Brian Boshoff (Heidelberg on the edge)

Quirky origins

Heidelberg is an old settlement in South African terms. It existed long before Johannesburg, having been established as a trading post in 1862. For the short and turbulent period between 1880 and 1883, Heidelberg was the capital of the Transvaal, but when the government returned to Pretoria, Heidelberg became a mainly agricultural service centre once again.

Gold was discovered in the hills around Heidelberg in 1885, a year before the discovery of the Main Reef in Johannesburg. Periodically, gold mining companies were floated with mining ventures around Heidelberg, but they all failed. The Heidelberg Roodepoort mine, for example, started in 1896, with forty stamps and an investment of £150 000, but was liquidated after a year (Curle, 1905).

Nigel had a somewhat quirky beginning, two-and-a-half decades after Heidelberg was founded. In 1888, payable gold was discovered on the farm Varkensfontein, 10 km north of Heidelberg, and President Kruger declared a public diggings. The farm owner, popularly known as Oom Lang Piet, was reading Sir Walter Scott's *The Fortunes of Nigel*

(1822)²⁸ at the time that a prospector appeared on his farm. He rejected the overtures of the prospector and eventually established his own company, Nigel Gold Mining Ltd, which developed the moderately-sized Nigel mine. The big companies soon arrived, however, and the Sub-Nigel mine was registered in 1895 by Consolidated Gold Fields. The Sub-Nigel mine took time to mature, and was disadvantaged after the South African War as it fell outside the designated area for Chinese indentured labour, but by the 1930s, Sub-Nigel had become one of the great giants of Witwatersrand mining.²⁹

For more than two decades, the settlement around the Sub-Nigel and Nigel mines was little more than a scraggly mining camp. In 1923, a *dorpsraad* (village council) was set up, which provided some order, and in 1930 it was elevated to a town council.

Boomtown in the 1930s

The Great Depression threatened the future of Nigel, but when South Africa abandoned the Gold Standard in December 1932 and devalued its currency, the price of gold soared. In Nigel, the driving force in this revival in the 1930s was the Sub-Nigel mine,

28. *The Fortunes of Nigel* is a historical novel about a young Scottish nobleman who is the victim of a complex intrigue but who ultimately succeeds in outwitting his tormentors.

29. In the period 1909–1971, Sub-Nigel produced 15 million ounces of gold.



Photograph by Brian Boshoff

which quickly rose to stardom, but a number of other mines were developed in the decade including Spaarwater, Vlakfontein and Vogelstruisbult. The period 1934 to 1939 was boom time for Nigel, with no fewer than five new town extensions being proclaimed, and large-scale speculation in fixed property taking place. The development of the town was also helped by the opening of the railway line from Springs through Nigel to Heidelberg, in 1935 (Macnab, 1987).

Despite the new rail connection, Nigel still remained somewhat peripheral to major urban hubs on the Witwatersrand, which had both drawbacks and benefits. Macnab (1987: 50) writes that the white community in Nigel, “being somewhat isolated from the city life in Johannesburg with its bright lights ... created its own self-sufficient community, organized its own life”.

Early industrialisation in the 1940s and 1950s

In the 1940s, there was a slowdown of production in mining because of the need to refocus labour and resources on the war effort. This exacerbated tensions in the mining industry. In 1942, an African mineworkers union was established, and action to protect the rights of workers escalated until a full-blown strike was called in August 1946. Nigel was the site of some of the worst violence during the strike. On 13 August, police fired at the striking workers on the mine, killing five and injuring ninety-one (South African History Online, 2011a).

In the 1940s and 1950s, however, there was an early beginning to manufacturing in the district. A Mr Cook of TJC Holdings gained the Coca-Cola franchise in South Africa for Nigel and Heidelberg, and opened the Nigel Bottling Company. In 1949, production of Coca Cola began in Nigel under license. There were positive developments in Heidelberg too, related mainly to agro-processing. In 1954, Eskort, a manufacturer of processed pork products, opened a factory in Heidelberg to gain easy access to the large market on the Witwatersrand (Eskort, N/D).³⁰

By the late 1950s, the older mines in the district were winding down. The Nigel Gold Mining Company, for example, ceased production in 1957, placing a question mark over the future of the town. However, in the same year, a large Australian company, Commonwealth Engineering (Comeng), invested in Nigel, establishing a subsidiary, Union Carriage & Wagon Company (Pty) Ltd (UWC), and production began in 1959. Over the next decades, almost all the locomotive coaches for the South African Railways – around 14 000 – were produced by UWC, and for a period, the plant in Nigel was among the largest of its kind in the world (Dunn, 2006). Other forms of metal fabrication developed in Nigel from the late 1950s. Babcock Africa Ltd, a subsidiary of a leading British multinational company involved with construction and engineering, also established in Nigel. Rogerson and Rogerson (1997) indicate that by the end of the 1950s, the structure of Nigel’s manufacturing economy was established. The primary contributions by Nigel to the wider

30. Previously, its only factory was in Estcourt, in Natal (Eskort N/D).

economy, even to the present day, are machinery and fabricated metals, transport equipment, and glass products.

Nigel's success in attracting this investment proved critical to its ability to, at least partially, transcend the mining cycle. We may speculate that Nigel's ability to pull in major foreign investment at this time had something to do with the strong political connections of the then spatially marginal small town. The member of parliament for Nigel at the time was B.J. Vorster, who had risen rapidly through the political hierarchy since his election to parliament in 1953.³¹

Treading water in the 1960s and 1970s

There was a marked slowdown in mining on the Far East Rand in the 1960s as the older mines reached the end of their economic life in the context of a stable, but low, gold price. At its peak, there were 24 operating mines and 90 shafts on the Far East Rand, but by the end of the 1960s the only significant remaining mines were Vlakfontein and Spaarwater. Sub-Nigel declined gradually through the 1960s, and finally shut down in 1971 (Macnab, 1987).

The industries established in preceding decades, and especially UWC, helped moderate the effects of the decline in mining. However, the Far East Rand did not benefit significantly from further growth in manufacturing in the 1960s, despite the boom in manufacturing nationally in this decade, and the emergence of the East Rand, more generally, as South Africa's 'industrial workshop'. Nigel maintained its industrial base but was peripheral to the expansion in manufacturing on the East Rand, which happened mainly in localities closer to Johannesburg such as Germiston, Kempton Park and Boksburg. Nevertheless, there was some expansion

in small-scale metal-related industries, and in military equipment.

With the modestly-scaled manufacturing sector in Nigel, there was a need to accommodate African workers outside the mining compounds. There was a small township called Charterston, but the apartheid planners considered it to be dangerously close to white residential areas, and between 1964 and 1975, there were relocations to the newly-proclaimed African township of Duduza.

Heidelberg had remained a small but fairly stable town, serving a reasonably prosperous agricultural district. In the 1970s, it benefitted from the expansion of the South African Defence Force, when the South African Army Gymnasium and South African Signal Corps were located there.³² There was also some benefit from the proclamation of the Suikerbosrand Nature Reserve in 1975, which included a (then whites only) public resort.

However, in the 1970s, Heidelberg benefitted from the intensification of agriculture, and further development in agro-processing. In this decade, the beef producer, Karan, located near Heidelberg, began its rapid expansion to become South Africa's largest integrated beef producing company, and the largest beef feedlot in the southern hemisphere (Kuhn, 2012).³³ The second largest feedlot in South Africa, PK Farming and Mancho Ranch, also developed in the same district. The major development in agro-processing came in 1978 when the Rembrandt Group, later Rothmans International, opened a large tobacco processing factory in Heidelberg.³⁴ In 1999, British American Tobacco took control of Rothmans International, and the factory became part of the stable of its subsidiary, British American Tobacco (South Africa) (BAT-SA).

31. He was appointed a deputy minister in 1958, minister of Justice in 1961, and became prime minister in 1966 after Hendrik Verwoerd's assassination.

32. The SA Signal Corps moved to Pretoria in the mid-1980s.

33. The Karan estate now accommodates 120 000 cattle, with a feed-mill processing 1 400 tons of beef per day. Karan opened an abattoir in the town of Balfour in neighbouring Mpumalanga, and has established its distribution and marketing centre at City Deep in Johannesburg. See the Karan Beef website: <http://www.karanbeef.co.za/AboutUs>

34. Although this was an agro-processing plant, the tobacco was not produced locally but procured from suppliers across the low-lying northern parts of South Africa.



Photograph by Clive Hassall

Deepening troubles in the 1980s and early 1990s

In the 1980s, the local economy staggered onwards, battered by the gathering political storm in the country as a whole, and by political conflicts locally. Kok (1998) reports that the real annual GGP growth of the Far East Rand for the decade 1981–1991 was -4.0 per cent, stabilising to zero per cent in the period 1991 to 1993. The only significantly worse performer was Westonaria on the Far West Rand, with an annual change of -10.8 per cent for 1981 to 1991, and -2.7 per cent for 1991–1993. The economic troubles were reflected also in declining rates of population growth as the area was no longer attractive to migrants. Growth rates in the period 1980–1985 were still a respectable 2.25 per cent, per annum, higher than the regional average, but for the period 1985–1991, they slumped to only 1.21 per cent, lower than the regional average (Simkins, 2010). This poor performance resulted from the continued long-term decline of mining, but also, increasingly, the mediocre performance of manufacturing.³⁵ It is difficult to disentangle national from local factors in the crisis that faced Nigel's economy at the time, however.

Rogerson and Rogerson (1997) observe that while there was a small net gain in manufacturing employment on the Witwatersrand as a whole in the period 1980–1994 (despite a significant relative loss), this growth was consolidating in the core, with a real loss of employment in peripheral locations. Barchiesi and Kenny (2002) write of a steady decline in manufacturing industry on the East Rand in the 1980s, a decade in which South Africa's economy, as a whole,

was depressed, and of the even more severe decline on the Far East Rand, where Nigel is located. Even on the Far East Rand though, there was variation. Springs performed relatively well, Brakpan did badly, and Nigel performed somewhere in-between, while still suffering a steady loss of employment.

UWC, the largest manufacturing employer at the beginning of the decade, almost folded, with employment dropping in the 1980s from 900 to 100. The crisis followed the near collapse in demand for rolling stock in South Africa in the 1980s, and it was only a contract to supply carriages for the Taiwan Railway Administration that helped the company survive. UWC experienced a series of ups and downs. There was some expansion again in the early 1990s, but the failure of an international contract, and a near collapse in rail travel in South Africa, saw employment in the firm dropping again from 600 in 1997, to only 250 in 1999. The second largest company in Nigel, Babcock Powerlines, also experienced tough times, retrenching one-half of its 700 workers in 1983 (Seekings, 1990; Barchiesi and Kenny 2002).

By the 1990s, there was widespread concern about the 'de-industrialisation' of the East Rand (Bloch, 1993; CDE, 1997; Rogerson and Rogerson, 1997, 1999a, 1999b; Barchiesi and Kenny, 2002).³⁶ In 1997, for example, the Centre for Development and Enterprise (CDE) published the report of its study of the East Rand, arguing that the future of this metropolis was of national concern, and that it "needed a plan quickly". Rogerson (2005) observes that during the 1980s and early- to mid-1990s, the East Rand, and especially the Far East Rand, seemed to be little more than an expanding rustbelt.

35. On the East Rand, the areas closer to Johannesburg (Benoni, Boksburg, Germiston, Kempton Park) contributed 48 per cent of the Witwatersrand's employment, compared with only 8 per cent combined for the Far East Rand (Brakpan, Springs and Nigel) (Rogerson and Rogerson, 1997).

36. Reasons given by these authors for the crisis include: the end of the apartheid era policies of economic protectionism; reduced investment in state-owned enterprises including Sasol and Eskom; transnationalisation of industries with loosening linkages to other local firms; and intense labour conflicts.



This concern also related to extreme levels of violence and political conflict on the East Rand, including in Duduza and Nigel, until 1994. Local political conflict was severe, with increasingly violent school, consumer, bus and rent boycotts. The conflict was initially between the state and local activists organised by the Duduza Civic Association, and between unionised workers and bosses, but in the early 1990s there was also bitter internecine conflict between supporters of the African National Congress (ANC) and the Inkatha Freedom Party (IFP).

Restored hope (and a local mining fiasco) from the mid-1990s

The East Rand was arguably still in crisis, but some sort of turning point was reached in the mid-1990s even as writers were presenting bleak assessments. Rogerson (2005) suggests a positive turnaround from around 1996. Simkins (2010) observes that there was renewed net in-migration into Nigel in the 1990s, although at a modest scale. The population of the town was growing slightly slower than the province as a whole, but growth was not significantly worse.³⁷ It was not doing as well as the parts of the East Rand closest to Johannesburg, but was doing better than even more peripheral places such as Heidelberg, and significantly better than the Far West Rand, where economic growth remained negative (Simkins, 2010).

In 1995, democratic local government was established in Nigel. The ANC won all the seats in Duduza, and the National Party won all the seats in the white areas (displacing the previously dominant

Conservative Party). Overall, the ANC received two-thirds of the votes. Nigel later became part of the Ekurhuleni Metropolitan Municipality, which was an amalgam of 22 apartheid-era municipalities. The question at the time was whether this amalgamation would be to the advantage of relatively marginal and small parts of the metropolitan area, such as Nigel. Heidelberg, however, remained outside the metropolitan municipality, forming the urban core of the Lesedi Local Municipality.

The creation of a metropolitan council created the potential for more integrated long-term economic strategising. In the early 2000s, the metropolitan council did, in fact, respond with a local economic development framework, but this was criticised for lacking an economic analysis, and for focusing only on redistributive aspects, without a sense of how the economy should grow (Rogerson, 2005). From around 2008, the metropolitan municipality does seem to have been able to play a positive role in attracting investment, including to places such as Nigel. In contrast to the earlier framework, Ekurhuleni 2055, the long-range strategy launched in 2013, included a 're-industrialisation plan' built around 13 pillars of intervention, including improved support for and responsiveness to manufacturing enterprises, a greater focus on green-economy prospects, and upgraded infrastructure networks.

There was promise in the mining sector in the early 2000s, with the re-opening of mines that had closed in the 1960s and 1970s, but the decade ended with a fiasco that shamed the mining industry. The

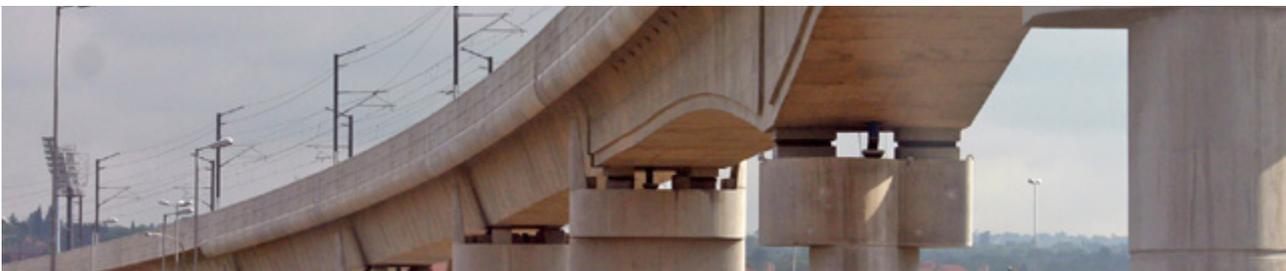
37. In the period 1991–1996, Gauteng's population grew at 3.61 per cent, per annum, increasing slightly to 3.72 for 1996–2001. The figures for Nigel were 3.32 per cent and 2.02 per cent (Simkins, 2010).

Grootvlei mine was already in serious trouble in the late 1990s because of the ingress of acidic water into its shafts (*Engineering News*, 3 September 1999). In 1997, Grootvlei was purchased by Harmony Gold (Pty) Ltd, but later the mine was sold on to a succession of smaller companies. In 2009, Aurora Empowerment Systems (Pty) Ltd bid nearly R500 million for the ailing mine, promising to invest a further R600 million, but within a year, Aurora had stripped the mine of its assets, and production was at a standstill. The company failed to pump consistently, and the shafts flooded with untreated and highly toxic acid mine drainage (AMD), decanted into the Blesbokspruit River. The pumping stopped altogether in 2011, and the entire East Rand water catchment was placed at risk, with AMD threatening plant, animal and human health. There was also a rapidly emerging social crisis. Creditors and workers on the mine were not paid, leaving an increasingly destitute and angry community. Liquidators were appointed, but they were also implicated in the gathering crisis and eventually removed from their positions by the Master of the High Court, with both the company and the liquidators being sued for around R2 billion in damages (*Business Report*, 30 May 2011; *Mail & Guardian*, 3 June 2011; *Mail & Guardian*, 16 May 2014; *Times Live*, 15 April 2015).

However, even as the fiasco unfolded at Grootvlei, new opportunities emerged in mining that suggested the downward trajectory could be reversed and mining might experience a partial revival. At the centre of this

story is the mining entrepreneur, Neal Froneman, who had a vision of consolidating mining assets and rights on the Far East Rand in a way that would re-establish the profitability of mines. In 2006, he brought the old Modder East mine back into production using new access methods and technologies, and then began a much bigger project of consolidation, bringing together, within a single bundle of rights, the deposits of the previous Modderfontein Mines and old Nigel Gold Mining Company. He also moved into unmined areas. In addition, in 2012, Froneman acquired some of the assets and rights of the beleaguered Grootvlei mine. Froneman's company, Goliath Gold, has created one of the largest brownfield exploration properties in the world, with a potential for at least three to four mines the size of Modder East (*FinWeek*, 18 April 2012; *BDLive*, 6 August 2012; www.goliathgold.com).

There is also new promise in manufacturing, and especially, in the established industries linked to locomotive production and beverage bottling. UWC had mixed fortunes. In the mid-1990s, construction giant, Murray and Roberts acquired the company and modernised its production plant. In 2008, UWC was successful in bidding for a contract to assemble coaches for the Gautrain.³⁸ In 2013, UWC was sold as part of a black empowerment deal backed by the IDC, but within a year the company was retrenching labour as Transnet contracts for new locomotives went to companies in China and North America. The unions were infuriated and the union federation,



Photograph by GCRO

38. See <http://www.gautrain.co.za/newsroom/2008/07/ready-to-roll-in-nigel/>

Cosatu, led protest marches in Nigel (*Engineering News*, 8 February 2013; *Railways Africa*, 21 October 2014). However, Nigel may yet benefit from the largest-ever contract in South Africa's history. In 2014, a BEE holding company, Gibela, was awarded a massive, ten-year, R51 billion contract to supply the Passenger Rail Agency of South Africa (PRASA) with 600 trains to replace old Metrorail rolling stock. Gibela has indicated that it aims for 70 per cent local content and will target around 100 South African firms as component and service providers. Dunnottar, land previously owned by the South African Defence Force, 10 km north of Nigel towards Springs, has been identified as a production hub for locomotive construction (*Engineering News*, 19 May 2014; *Engineering News*, 20 July 2014). Controversies have emerged over this contract, however, with fears that, for example, the consortium, which includes a large French company, may not be able to meet its commitments to local content (*News24*, 10 May 2015).

There have also been significant developments in the beverages and bottling industries. In 2006, Coca-Cola South Africa purchased TJC Holdings from the Cook family.³⁹ A year later Coca-Cola South Africa entered into a black economic empowerment (BEE) deal with Cyril Ramaphosa's Shanduka Group, and the Nigel plant became the first majority black-owned and managed bottler in South Africa. The major advance in the sector came in 2011, however, with the opening of the new R1.9 billion Consol

Glass plant in Nigel, which will add a further 220 000 tons of glass production per year (Bigale, 2011). There was also the construction of Asambe Steel Corporation's new, IDC-financed, R1 billion steel mill, which recycles scrap metal. The upturn in manufacturing in and around Nigel is layering on the existing industrial base and infrastructure, which was already in place by the late 1950s. The question remains, however, why manufacturing is seeing growth now after decades of stagnation, or even decline. The overall economic context is, after all, not auspicious.

There are indications of an increasing shortage of available, reasonably priced and well located industrial land in the metropolitan core, which could account, in part, for a return to industrial growth in some edge locations, including Nigel. A 2008/9 study on industrial land commissioned by the City of Johannesburg indicated, for example, that demand for industrial land in Johannesburg would exceed supply by 2018, and that the growing shortage is driving up industrial land costs and rentals.⁴⁰

The role of the metropolitan local authority appears to have been a critical factor. At first the Ekurhuleni Metropolitan Council, established in 2000, was preoccupied with the immense task of integrating multiple previous local authorities in a spatially-fragmented urban context. As mentioned previously, Ekurhuleni's economic strategies were initially nebulous and unrealistic. However, by the



Photograph by Clive Hassall

39. The company was renamed Scarlet Ibis Investment 3, with the Nigel plant being called Central Bottlers.

40. Rentals in the prime locations of Sandton, Randburg and Strydom Park were as much as R80/m² in 2008.

“Nigel has historically served as a retail core for the Far East Rand but there are emerging competitive threats. The 2011 Ekurhuleni Metropolitan Spatial Development Framework identified early signs of retail decay in the Nigel CBD, and emphasised the need to sustain Nigel’s role as a retail centre...”

end of its first decade, Ekurhuleni was aggressively pursuing an Industrial Revitalisation Strategy. Although the main focus of attention was building an *Aerotropolis* around O.R. Tambo International Airport in Kempton Park, Ekurhuleni also worked hard to support industrial development at the opposite end of the metropolitan city, including in Nigel (City of Ekurhuleni, 2010). Municipal insiders report that the metropolitan authority played a key role in attracting the Consol Glass investment to Nigel, and in facilitating other investments (*Engineering News*, 25 November 2011).

Heidelberg has never had the advantage of a large metropolitan authority pulling investments towards its locality, but it remained economically stable, with growth in some sectors. In 2006, BAT-SA, the largest single employer in the Lesedi Local Municipality, consolidated its production capacity in Heidelberg when it closed its factory in Paarl, in the Western Cape.⁴¹ The tobacco industry is under pressure, however, from the anti-tobacco lobby, stringent new state controls on smoking, and illicit imports of cigarettes (*Mail & Guardian*, 20 December 2013). Production in South Africa has declined, although increased prices have sustained profits. In 2008, the Heidelberg factory was modernised, but greater automation reduced the labour force from its peak of around 1 300 to 800 (*Business Excellence*, 21 November 2011). More recently, BAT-SA has indicated that it will be expanding production facilities, and this may result in the restoration of some of the lost jobs.⁴² The tobacco plant remains the single largest

agro-processing industry in town, but there have been other developments. In 2008, for example, Coca-Cola (South Africa) established a new Valpré Spring Water plant just east of Heidelberg, taking advantage of the powerful, non-polluted aquifers in the district.⁴³

Heidelberg’s location on the route between Johannesburg and Durban has supported its role as an emergent logistics hub. Jameson Park, midway between Heidelberg and Nigel, is the endpoint of a multi-product pipeline from Durban to Gauteng that carries transport diesel, petrol and jet aviation fuel, providing an estimated 500 jobs (Lesedi Local Municipality, 2008). Also of potential importance to the town is the development of the Gateway Logistics Hub on the border between the Lesedi and Sedibeng municipalities, which will warehouse bulk freight from Richards Bay and Durban ports for more efficient distribution in Gauteng and the other northern provinces. It is estimated that the hub will extend over 500 ha and create 13 000 direct and indirect jobs (Lesedi Local Municipality, 2012).

Nigel has historically served as a retail core for the Far East Rand but there are emerging competitive threats. The 2011 Ekurhuleni Metropolitan Spatial Development Framework identified early signs of retail decay in the Nigel CBD, and emphasised the need to sustain Nigel’s role as a retail centre, specifically to retain existing high street national chain stores within the Nigel CBD (City of Ekurhuleni Metropolitan Municipality, 2011). The key challenge,

41. BAT-SA buys more than 90 per cent of South Africa’s annual tobacco crop, and has an 85 per cent share of South Africa’s legal cigarette industry, with popular brands such as Dunhill, Kent, Peter Stuyvesant and Rothmans. (*Mail & Guardian*, 20 December 2013).

42. See www.batsa.co.za.

43. See www.cocacola.co.za/brands/valpre.html.

however, is to the CBD's traditional role in meeting the retail needs of the African market, as malls develop in the townships. The new 30 000 m² Tsakane Mall, south of Brakpan, is one of the largest township malls in South Africa.

Nigel is also facing new retail competition from Heidelberg, which has the advantage of a location on the primary route between Johannesburg and Durban. The most significant recent development was the opening of the 35 000 m², regional-scaled, Heidelberg Mall in 2014. Located at a major interchange on the N3, this mall is an innovative joint venture between the Lesedi Local Municipality and private developers (Heidelberg GP, 2014).⁴⁴

A further – although modestly sized – area of growth for Heidelberg is in retirement housing and services, with indications suggesting that Heidelberg is attracting retirees in the middle-class market segment (Lesedi Local Municipality, 2012). Heidelberg's relative proximity to, but also distance from, the metropolitan core may account for the relatively high proportion of older people living in the town. A website for local businesses boasts that Heidelberg is the 'small town with 'big city' benefits' (Heidelberg GP, 2014).

There is a new twist in Heidelberg's future development path. There are reports that a large opencast coal mine will be opened in the Heidelberg district, immediately adjacent to the Karan beef feedlot, to provide fuel to the Grootvlei power station located south of Heidelberg in Mpumalanga. Controversy has already erupted over the damage this development may cause to agriculture in the district. Ironically, the town that avoided dependence on mining may yet become a centre for mining (*Mail & Guardian*, 8 May 2015).

Conclusion

The stories of Nigel and Heidelberg are ones of modest success. These towns never developed as major economic hubs, and remain small in relation to the overall GCR economy. Nevertheless, these are respectably-sized towns with diverse economies, and with recent indications of renewed growth.

The industrialisation – mainly foreign investment – that happened in the 1940s and 1950s before the major mines in the area closed, was critical to Nigel's economic durability. Nigel's story offers some hope to economies dependent on mining, in apparent contrast to Carletonville's story, although more research is required to understand the reasons for this relative success. It is apparent that in some periods – for example, during the 1950s, and in the current period from around 2010 – Nigel's somewhat peripheral location conferred benefits that exceed disadvantages. The lower land and labour costs, for example, have more than compensated for its relative distance from the metropolitan core. Also, while Nigel is spatially peripheral within the GCR, it has not always been peripheral to networks of power in politics and business. In recent times, active marketing by the metropolitan authority, and support from state agencies such as DTI and IDC have supported growth in the town.

For Heidelberg, the key factor has been market accessibility. The town endured long after the early failed attempts at gold mining, and gradually expanded, and this was primarily because of its location on the major route between Johannesburg and Durban, which supported agriculture and agro-processing. More recently, it has supported the growth of the retail and logistics industries. Heidelberg has not had the advantage of being in a metropolitan authority, but the local council has been proactive, for example, in the partnership that produced the Heidelberg Mall.

44. This new development is in addition to the four existing shopping centres in Heidelberg, a medium-sized town.



Photograph by TJ Pytheas

3. State-implanted industry on the edge

(the Vaal Triangle)

3.1 State-implanted manufacturing

The Vaal Triangle is a striking example of a large urban complex on the spatial periphery of a city-region, created mainly through deliberate state action to promote manufacturing activity. Internationally, there are many examples of this form of development in countries that were previously state socialist, or still retain elements of state socialism, such as the People's Republic of China. The Vaal Triangle is, however, the product of the activities of an economically interventionist state, within a predominantly market-based, or mixed, economy.

South Africa is not the only instance of state ownership of industry outside of state socialism. Ahuja and Majumdar (1998: 115) report that in India, "state-owned firms are active in every sector of the economy, from petrochemicals and manufacturing to mining, trading, and services ... [O]f the top twenty-five largest corporations in India, twenty are state-owned". This was also the case in Latin American countries, historically, where state-owned enterprises were dominant in the mining and petroleum industries at times, and were significant in manufacturing as well (Vernon, 1981). In the Middle East and North Africa, the state remains a direct participant in industrial and mining sectors (OECD, 2013). In Western Europe, too, there were periods in which direct state ownership

of enterprise expanded. In France, for example, the state took ownership of strategic firms in energy, finance and transportation (famously, Renault) in the 1940s, and further expansion of state ownership took place under President Mitterrand in the 1980s (Cohen, 2010). Even in the economically liberal United Kingdom, the state has historically played a direct ownership role in some forms of manufacturing. For example, for around two decades from the early 1970s, the majority of voting shares in British Leyland (the Rover Group), Jaguar, and Rolls Royce, were held by the state, with state ownership in aerospace, shipbuilding and steel-making, as well (Floud and McCloskey, 1994).

Very little has been written about the spatial location and decision-making of state-owned enterprise in manufacturing outside state socialism, despite the apparent significance of state ownership in this sector, historically. In British scholarship, there is some reference to the spatial impacts of the decision to nationalise British Leyland (see, for example, Hall, 2014), and Markusen and Park (1993) write of the state as an "industrial locator" in South Korea, arguing that the state responds to different priorities than civilian firms do, with strategic concerns playing a key role. Lall and Chakravorty (2005) report on a multi-sited study in India, and

"Very little has been written about the spatial location and decision-making of state-owned enterprise in manufacturing outside state socialism, despite the apparent significance of state ownership in this sector, historically."

argue that private-sector investments tend to favour existing economic industrial concentrations, while state-owned companies often direct investment away from these concentrations, influenced by political concerns for spreading development. In general, however, the spatial dimension of state ownership in manufacturing is largely unexplored, and so a South African case may add significantly to the sparse literature.

In South Africa, state-owned manufacturing emerged around 1924 during the tenure of the so-called Pact Government. The state has had a direct-ownership role in transport (for example, South African Railways), telecommunications (South African Post Office) and energy (Electricity Supply Commission – Eskom), and it has also had a strategic stake in manufacturing through its direct ownership of the major manufacturing corporations, Iscor and Sasol, as well as through its major financial instrument supporting these companies, the IDC. Iscor invested, initially, in Pretoria, reinforcing an existing economic hub, but its subsequent investments were on greenfield sites in Vanderbijlpark (in the Vaal Triangle), Newcastle (in north-west KwaZulu-Natal), and Saldanha Bay (in the Western Cape). Sasol created the new towns, Sasolburg (in the Vaal Triangle) and Secunda (on the Mpumalanga highveld). Thus, through its direct ownership of manufacturing, the South African state played a role in spatial redistribution of industry in South Africa.

The major concentration of state-owned industry in South Africa was in the Vaal Triangle, which straddles the Gauteng-Free State boundary, and includes Iscor and Sasol plants, and large clusters of downstream industries.

3.2 The story of the Vaal Triangle

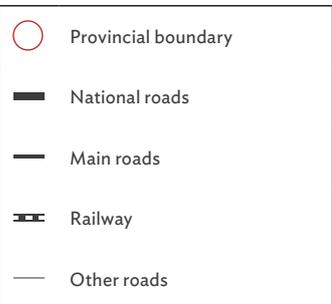
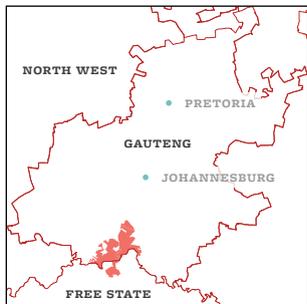
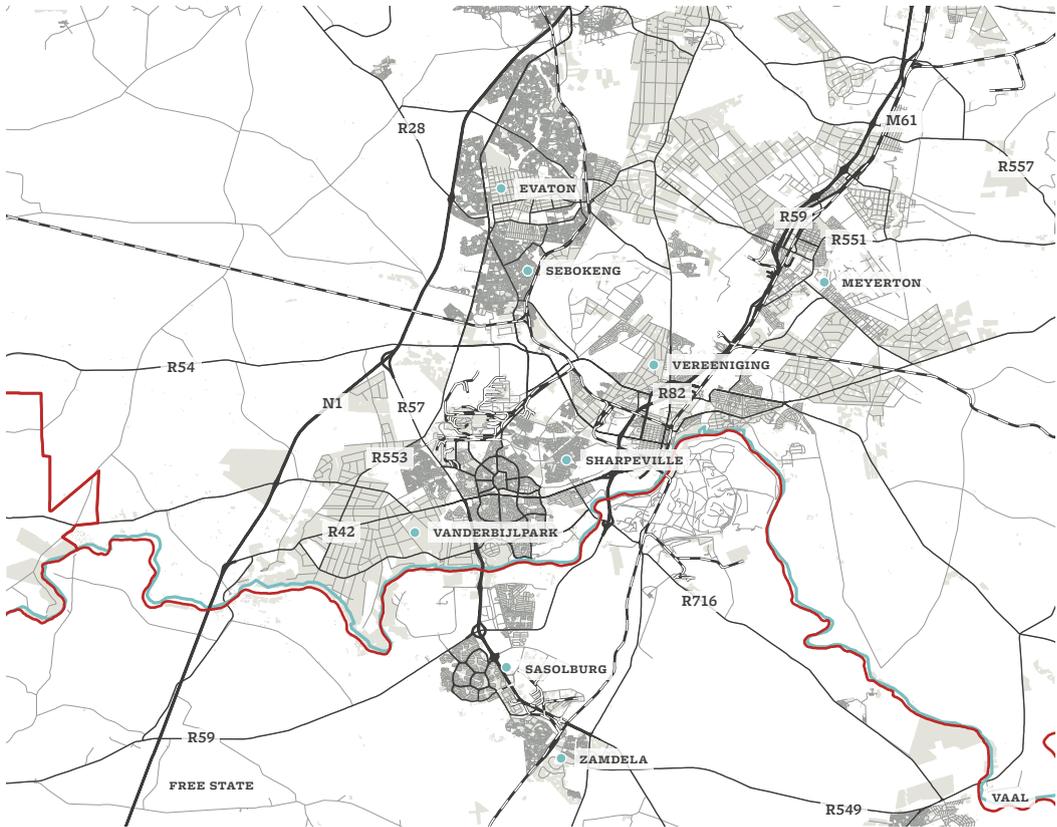
Introducing the area

The Vaal Triangle is centred around three large towns – Vereeniging, Vanderbijlpark and Sasolburg – which hold an agglomeration of metal-producing and petrochemical industries. Adjacent to these towns are the historically African townships of Sebokeng, Evaton, Sharpeville, Zamdela, Bophelong, and Boipatong, as well as smaller, previously-white, urban centres such as Meyerton and Henley-on-Klip. The Vaal Triangle is a cross-border region. The part in Gauteng, north of the Vaal River, falls within the jurisdiction of the Sedibeng District Municipality, and mainly within the Emfuleni Local Municipality, but includes parts of the Midvaal Local Municipality. Sasolburg and Zamdela township fall within the Metsimaholo Local Municipality under the jurisdiction of the Free State provincial government. The core town, Vereeniging, is 74 km from Johannesburg. The region is connected well to Johannesburg with national and provincial roads, a commuter rail network, and a national freight rail network.

In 2011, the population of the region was 879 884, a modest increase of 13.8 per cent on the 2001 figure of 773 368. The major centres of population in 2011 were Sebokeng (218 530), Evaton (132 848), Vereeniging (99 781), Vanderbijlpark (95 841), Zamdela (82 339), Sasolburg (39 696) and Sharpeville (37 999). The manufacturing-dominated economy had a GVA of R36.8 billion in 2013, making the Vaal the largest concentration of economic value-added activity on the edges of the GCR (Quantec, 2015). The economy remains dominated by manufacturing.

Figure 75: Locating the Vaal

MAP PREPARED BY Miriam Maina





Photographs by Brian Boshoff (Approaching the Vaal)

Industrialisation and the patrimonial state: up until the 1930s

The early development of the Vaal was the consequence of an extraordinary combination of individual entrepreneurialism and state patronage. The individual entrepreneur was Sammy Marks, a Lithuanian-born Jew, who came to the Cape Colony in 1869, via Sheffield in the UK. He moved to the Transvaal in 1881, where he established a strong and enduring friendship with President Paul Kruger. Through this friendship, he became one of the leading figures in business and political circles in the Transvaal and the Orange Free State, and was able to acquire a host of business rights. Marks also curried favour with the British, and was able to make an easy transition from supporting Kruger, to supporting Lord

Kitchener after the South African War, and then to supporting General Louis Botha after 1906 when his Het Volk Party came to power in the Transvaal. In 1910, Marks became a senator in the Union parliament, a position he held until his death in 1920 (Trapido, 1984; Mendelsohn, 1991).

Marks used the patrimonial relations he established with a succession of governments to advance his business interests, and to develop the Vaal region as an early hub of industry in the Transvaal. When coal was discovered along the Transvaal-Orange Free State border in 1878, he acted quickly, acquiring the 22 farms that were to make up his Vereeniging Estates, and established the Zuid-Afrikaansche en Oranje Vrijstaatsche Mineralen en Mijnbouwvereniging, to develop

the first collieries in the region. Marks persuaded Kruger to support the railway line from the Cape to the Transvaal, which passed through his Vereeniging Estates. Marks also convinced the Transvaal government to call the point at which the railway crossed the Vaal River, Vereeniging, meaning 'union' or 'association', as it linked the Transvaal with the Orange Free State (Trapido, 1984; Mendelsohn, 1991; Munnik, 2012).

The bridge crossing was opened in 1892, the year that Marks founded the village of Vereeniging to serve the collieries and railway sidings. In 1902, Marks used his connections with the Boers and the British to ensure that the peace talks which ended the South African War took place on his land. The Peace of Vereeniging, signed in May 1902, brought global name recognition to his fledgling town. With railway access to the rapidly-developing Witwatersrand, Marks was well placed economically, and he branched out from mining into agriculture and manufacturing, using his political contacts whenever he needed to. Marks formed the partnership, Lewis & Marks, with a distant cousin, and developed the first industries in the Transvaal, with government concessions, including a distillery, canning factory and glass factory. He had, however, a vision to turn Vereeniging into the 'Sheffield of South Africa' as a producer of steel and steel products. Marks knew that he needed water and power, and to provide these, he began by building the Leslie Barrage on the Vaal River, and persuaded Rand Mines, which needed power for its operations, to build the Vereeniging power station. At the time, this was the largest power station in southern Africa, and a pioneer in energy production (Mendelsohn, 1991).

Everything was in place for the development of a steel-producing hub – there was coal, rail, water and energy. In 1911, Marks landed a lucrative contract to supply the steel requirements of the Union Government and the South African Railways for a period of sixteen years. He established the Union Steel Corporation (USCO) and opened South Africa's first steel-making plant in Vereeniging in 1913. Through his entrepreneurial genius, and with the patronage of political elites, Marks developed an industrial cluster on his properties along the Vaal River. Soon other industries arrived. In 1927, Vereeniging became the corporate headquarters and steel-making production

site of the firm Stewarts & Lloyds. This firm, an amalgamation of the South African subsidiaries of the British firms, Lloyd & Lloyd, and A & J Stewart & Menzies, was headquartered in Vereeniging, alongside its production site (Chaskalson, 1986; Mendelsohn, 1991).

In the 1930s, an integrated metal-producing hub developed on the Vaal with USCO and Stewarts & Lloyds at the centre. Upstream of steel production, African Metals Corporation (Amcor) produced iron from the material provided by the collieries, and downstream firms such as African Cables and McKinnon Chain produced metal products. There were, however, threats on the horizon. In 1928, Iscor had been founded as a state-owned entity, and the first Iscor works were set up in Pretoria West in 1934. This was a major competitive threat to Vereeniging's firms, and possibly to its very existence, as Iscor had the benefit of state subsidy and protection, and of economies of scale (Hallowes and Munnik, 2006).

Industrialisation brought migrants into the area, mainly from Basutoland (now Lesotho). Without adequate provision of housing, many newcomers found their way to Top Location, a dilapidated mixed-race neighbourhood near the centre of the town. This was to become 'Vereeniging's Sophiatown' – shabby but vibrant. Top Location was a place of relative freedom, but police raids on illicit beer brewers (mainly Basutho women) and on shebeens (taverns) led to growing tensions. In 1937, a police raid provoked an angry response, and a large group, mainly of women, stoned the police. Six police officers were killed in what became known as the Vereeniging riots. It was an event that created considerable anxiety across South Africa, and was seen as a portent of future racial conflict (Bonner, 1990).

For many white residents, Top Location was uncomfortably close to their own residential areas, while local industrialists believed that Top Location occupied land well suited to industry. Led by John Sharpe of Stewarts & Lloyds, who was also the mayor of Vereeniging, the municipality proposed to relocate the African occupants of Top Location to a new township to be called Sharpeville, several kilometres outside of town, where tight controls could be imposed (Chaskalson, 1986).

Direct state investment in manufacturing: 1940s and 1950s

By the late 1930s, the sustainability of Vereeniging's development was questionable, but the town was saved by World War II. Early in 1939, as war clouds gathered, General Jan Smuts approached industrialists to establish factories in the Vaal that could be used for armament production. Soon after war was declared in September 1939, the major industries in Vereeniging converted to war production: Union Steel produced aerial bombs; Stewarts & Lloyds made shells, and Amcor (later known as Samancor) opened a metalloids plant critical for weapons production. With most white men away at the front, the workforce consisted mainly of white women and Africans (Leigh, 1968).

The war massively underscored the need for steel production. Steel was clearly needed for weaponry but local steel-making was also necessary to support other forms of manufacturing as South Africa was effectively cut off by the war from international supplies. In 1941, the eminent industrialist, and long-time advisor to General Smuts, Dr Hendrik van der Bijl, recommended a second Iscor steel plant. Witbank in the Eastern Transvaal was a possible location because of its large coal supplies, but Louis Marks (the son of Sammy Marks) persuaded Van der Bijl to select a site on the banks of the Vaal River, west of Vereeniging, which was owned, of course, by the Marks family. Construction began almost immediately and a

specialist steel mill for armoured plate production for ship repairs was completed on this site in 1943 (Leigh, 1968; Freund, 2015).

In 1947, work began on a fully-fledged integrated steel plant, and the town of Vanderbijlpark, proclaimed in 1949, was built by Iscor's property arm, Vesco, to accommodate the white workers in the new plant (Leigh, 1968).⁴⁵ Vanderbijlpark was built according to garden city principles, and the townships of Bophelong and Boipatong were established for African workers using a paternalistic and reduced version of these principles (Hallowes and Munnik, 2006; Freund, 2015).⁴⁶

The creation of the Iscor plant had begun under the patronage of General Smuts and Hendrik van der Bijl, but construction was completed by the National Party government, which had come to power in 1948. In 1947, Iscor had run into financial trouble as Smuts was only willing to fund one-third of the construction using the state fiscus. The National Party, however, demonstrated no such reluctance in creating state-owned industry, and used the state to fully fund the project. The Vanderbijlpark steelworks opened in 1952, with a production capacity of 320 000 tons of steel per annum. It immediately showed profits, and continued expansion through the 1950s, supporting the rapid growth of the town of Vanderbijlpark (Leigh, 1968; Hallowes and Munnik, 2006).

The creation of Vanderbijlpark was, however, an immediate threat to Vereeniging and its



Photograph by World Bank Photo Collection

45. The town planner was the well-known Roy Kantorowitch, who also designed the Cape Town Foreshore.

46. Hallowes and Munnik (2006: 84) write that "Van der Bijl's metropolitan imagination indulged an ethnic fancy: the blocks of houses in Bophelong's residential areas were laid out "in the traditional 'kraal' formation".

“The town of Sasolburg was built in the early 1950s to house Sasol’s white workers. It was planned by Swiss immigrant, Max Kirchhoefer, who was inspired by designs for British new towns. African workers were housed in Zamdela township...”

privately-owned industries. The Vereeniging town council lobbied national government and helped broker a deal in which Iscor was given a controlling interest in USCO, in return for assigning the production of certain steels to the Vereeniging plant. This ensured the survival of USCO, and the continued growth of Vereeniging, but created a new monopoly on the production of steel in South Africa. After the war there was a further surge in industrial expansion in Vereeniging, with an influx of managers, engineers, technicians and artisans, which led to suburban expansion around the town (Leigh, 1968; Chaskalson, 1986).

In 1945, the long patronage of the Marks family came to an end when the Anglo American Corporation of South Africa bought out the firm Lewis & Marks, including its subsidiary, Vereeniging Estates. In the 1950s, Vereeniging benefitted from a highly strategic, growth-oriented, town council. Early in the decade, Duncanville was established as an industrial estate and it quickly emerged as one of the most favoured locations for industry nationwide.⁴⁷ Vereeniging was able to provide industrialists with a compelling package – an abundant supply of water from the Vaal Dam; power supplies from four local power stations; a location along South Africa’s major railway line, with rail sidings on all large industrial stands. The town council also assisted with growth by turning a blind eye to violations of influx control, and largely ignored pollution controls (Chaskalson, 1986).

The next major development came with direct state investment in an oil-from-coal plant. The mining company Anglovaal had been exploring the possibility of synfuel production since the 1930s,

but once the National Party came to power in 1948, it was clear that the state would not allow a private company to take the lead in this strategic venture. In late 1950, Sasol was incorporated as a state-owned company, and the Sasol I plant was developed directly across the Vaal River from Vereeniging. It used a combination of German (Fischer-Tropsch) and American (Kellogg) technologies, and in 1955, produced its first petroleum fuel. The scheme nearly failed in this first decade, however, as costs were extremely high, there was a global oil glut, and the technology imported from the United States proved faulty (Sparks, 2012).

The town of Sasolburg was built in the early 1950s to house Sasol’s white workers. It was planned by Swiss immigrant, Max Kirchhoefer, who was inspired by designs for British new towns. African workers were housed in Zamdela township, notoriously downwind from the chemical plants (Sparks, 2012).

With the completion of Sasolburg, the three large industrial towns formed the Vaal Triangle. Apart from Iscor and Sasol, the state-owned electricity producer, Eskom, also invested heavily in the area, building the Taaibos and Highveld power stations and reinforcing this industrial and mining cluster. The 1950s were the halcyon days for the Vaal. In 1959, for example, the mayor of Vereeniging called the growing agglomeration the “premier industrial centre of the Union” (cited by Chaskalson, 1986: 2). At the time, the Vaal Triangle seemed set to continue to develop as the leading industrial hub in South Africa outside the major cities of Johannesburg, Durban and Cape Town.

47. Chaskalson (1986) records that the price for an industrial plot in Duncanville industrial estate in Vereeniging was \$700 per acre compared with \$100 per acre for a similar plot in Springs on the East Rand.



Photographs by Brian Boshoff

Political crisis and economic boom in the 1960s

The year 1960 began badly. On 21 January, a large section of the Coalbrook mine near Sasolburg caved in, killing 435 mineworkers. This was South Africa's worst ever mining disaster and the mine was abandoned within the year. Then, on March 21, 69 protesters were massacred outside the Sharpeville police station. The event reverberated nationally and internationally, with unrest spreading across the country. Prime Minister H.F. Verwoerd declared a State of Emergency, and banned the African National Congress (ANC) and Pan Africanist Congress (PAC) (South African History Online, 2011b).

There was profound shock locally that the small 'model township' outside Vereeniging was the site of such a global furore. Sharpeville was, after all, tightly controlled, and there was no apparent history of political activity. The white administrators in the Vaal had missed the growing tensions in the township. For households moving from the relative freedom of Top Location, the tight controls of Sharpeville rankled, and when the PAC was founded as a militant breakaway from the ANC in 1959, it easily found support in Sharpeville (Chaskalson, 1986).

The Sharpeville massacre is recognised as one of the path-changing moments in South African history, but the local consequences are less well understood. Did the Sharpeville massacre scare off investors, and is that one of the reasons that, in the 1960s, the Vaal lost its premier position to the East Rand?

The East Rand rode the wave of South Africa's industrial boom in the 1960s, but while the Vaal Triangle continued to grow, it failed to diversify its industrial base to protect against a future downturn in the founding industries.

South Africa's demand for steel increased consistently in the 1960s, supported by a booming national economy. To meet the growth in demand, Iscor's third plant was built in Newcastle in Natal, in 1969, and there was also a second development phase at the Vanderbijlpark works between 1964 and 1969.⁴⁸ Some downstream industries, such as the wire-netting plant established adjacent to Iscor by the Kaplan family, also developed at Vanderbijlpark. As the steel-making industry expanded, so the urban complex diversified, although it still lacked the diversity of opportunity in the metropolitan core. In 1966, for example, the University of Christian Higher Education at Potchefstroom set up a satellite campus in Vanderbijlpark.⁴⁹

In the 1960s, Sasol solved its technological problems, and made new improvements to the technology, so that by the early 1970s it was selling licenses for oil-from-coal technological processes to international buyers. In his doctoral thesis, Stephen Sparks shows how the Sasol project fed into the "techno-nationalism" of apartheid South Africa. It was a source of white national pride, but also became central to the government's attempts at self-sufficiency, once trade sanctions started to bite, eventually supplying 28 per cent of South Africa's fuel needs (Sparks, 2012).

48. See www.arcelormittals.com.

49. www.nwu.ac.za/content/history-potchefstroom-campus-potchefstroom-campus-nwu.



The South African government's support of the development of an integrated petrochemical complex at Sasolburg was also linked to the economic empowerment of white Afrikaners. Sasol branched out into the development of by-products of the synfuel process, including the production of synthetic rubbers and fertilisers. Other companies established at Sasolburg were doing the same. In 1964, for example, the IDC financed Karbochem, a subsidiary of Fedvolk, to develop a synthetic rubber plant in Sasolburg. Between 1968 and 1973, Natref constructed its large inland oil refinery at Sasolburg, funded by the IDC as a joint venture with Sasol and the Compagnie Française de Pétroles (Total), but also with the involvement of Afrikaner empowerment companies, Rembrandt, Volkskas and SA Mutual (Ndzamela, 2015).

As the Vaal complex continued to grow, various attempts were made to ensure spatial co-ordination at a regional scale. In a major shift in policy, the government established Sebokeng in 1965, as a regional township in which all African residence was to be consolidated. The task of moving all the residents of Bophelong, Boipatong, Sharpeville and Everton to Sebokeng, proved to be extremely difficult, and in 1979, it was finally agreed to upgrade Sharpeville rather than relocate its residents.

The other rapidly emergent challenge was the growing levels of industrial pollution in the Vaal Triangle. Environmental controls were weak, nearly non-existent, until the Atmospheric Pollution Prevention Act, 1965. From 1967, Sasol did introduce measures to curb the worst excesses, but in the early 1970s Sasolburg was still choking under clouds of noxious gas (Hallowes and Munnik, 2006).

Socio-economic turbulence in the 1970s and 1980s

The 1970s brought a new, and far more difficult, global economic environment. The post-war era had been one of near sustained increase in global and domestic steel demand, with world steel consumption increasing from around 60 kg/capita in 1950, to over 140 kg/capita in 1973. The growth ended with the global oil crisis of 1973, and a period of immense volatility followed, with the levels of demand in 1973 only exceeded again after 2004 (Ispat Iscor, 2004).

Despite the economic troubles, Iscor continued with a major expansion of its Vanderbijlpark plant, doubling capacity between 1975 and 1983 (Hallowes and Munnik, 2006). The town of Vanderbijlpark continued to grow in the 1970s, with an extremely rapid average annual increase in population of 12.68 per cent (although this also had to do with the expansion of Sebokeng) (Simkins, 2010). Neighbouring Vereeniging, however, experienced population decline at a rate of -2.41 per cent, per annum, as its industries, with less state protection, were disproportionately affected by the market troubles. Overall, and largely because of the expansion of the Iscor works, the Vereeniging-Vanderbijlpark complex increased its share of the regional economy (present-day Gauteng) in the period 1970–1981, from 5.54 per cent to 6.37 per cent (Simkins, 2010).

While the global economic crisis impacted negatively on steel, it was a windfall for the synfuel industry, as oil prices surged, with Sasol becoming a highly profitable industry. Sasol's major expansion, however, took place in Secunda, in present-day Mpumalanga, where two new plants were built (Sasol II and Sasol III). In Sasolburg, the major new development was the completion of the Natref

refinery in 1973. Other downstream industries were also established, including the Sentrachem plant which produces PVC.

In 1979, Sasol became one of the first state-owned enterprises to be privatised. The company was listed on the JSE, with the state retaining 30 per cent of the shares, and 70 per cent being sold to private shareholders. This inaugurated a new era for the company, and for the town, with many uncertainties. The company moved its headquarters from Sasolburg to Rosebank, in Johannesburg, which generated considerable anxiety locally, and the fear that Sasol would be less committed to its place of origin than before (Hallowes and Munnik, 2006; Sparks, 2012).

The 1980s proved to be a difficult decade for the Vaal Triangle. On 31 May 1980, the

ANC's military wing, Umkhonto we Sizwe, attacked the Sasol and Natref plants in Sasolburg with spectacular visual effect. Damage was limited but it was a psychological blow to the apartheid government.

In 1982 and 1983, South Africa plunged into a deep recession from which it never fully recovered until after the end of apartheid. Iscor was in trouble. In 1983, expansion plans at Vanderbijlpark were put on hold. Troubles deepened in 1985 after Chase Manhattan Bank recalled its loans to South Africa, and Iscor lost much of its international market. Faced with a serious oversupply of steel, Iscor mothballed its plant at Newcastle, and also the two oldest blast furnaces in Pretoria. Only Vanderbijlpark was spared (Hallowes and Munnik, 2006).



Photographs by Brian Boshoff (Petrochemical complex in Sasolburg)

“The company moved its headquarters from Sasolburg to Rosebank, in Johannesburg, which generated considerable anxiety locally, and the fear that Sasol would be less committed to its place of origin than before...”

The Vereeniging-Vanderbijlpark complex continued growing economically, but at a lower rate than the regional economy. Its share of the regional economy fell back in the period 1981–1994, from 6.37 per cent to 5.94 per cent (Simkins, 2010).⁵⁰ The economic slowdown coincided with increased political mobilisation in the Vaal townships. In September 1984, police in the Vaal Triangle opened fire on a crowd protesting the introduction of the tricameral parliament, leaving 30 people dead. This event sparked a nationwide rebellion, with 600 dead within a year, and the government declaring a State of Emergency.⁵¹

There were also troubles in Sasolburg. In 1987, workers at the Sasol I and Natref plants went on an unprotected strike and 2 400 workers were dismissed, losing their company housing in Zamdela township. Although facts remain murky, there were claims that around 77 individuals were killed in police action during the strike, and comparisons have been drawn recently to the killings at Marikana in 2012.⁵² Attitudes in the local white community hardened. In 1985, the extreme far right Herstigte Nasionale Party (HNP) won a parliamentary by-election in Sasolburg.⁵³

Volatility in the 1990s until the 2008 recession

In 1989, Iscor was privatised and listed on the JSE, finally ending the era of state-controlled industry in the Vaal Triangle. From then on, industry in the Vaal Triangle had to navigate the turbulent winds of the national and global economies without direct state protection.⁵⁴

In 1991, Iscor gained full control of the USCO plant at Vereeniging, and renamed it the Vereeniging

Iscor works. However, despite this expansion, the newly-privatised corporation was in trouble. Iscor had developed behind the barriers of steep tariffs, and with the support of a range of state subsidies. It was a highly inefficient company in global terms as it provided the full range of steel types for the small, protected domestic market, which meant many high-cost and short-production runs. When South Africa joined the World Trade Organisation (WTO) in 1994, tariff levels for imported steel were reduced from 30 per cent to 5 per cent, with cost benefits for South African consumers, but with grave implications for Iscor (Hallowes and Munnik, 2006).

In the period 1994–2001, Iscor embarked on a major re-engineering process to contain costs and increase productivity. Inefficient production units were closed; steel grades were reduced from 302 to 50; and across its production plants, the workforce was reduced from 44 000 to only 12 200. At the same time, Iscor, with IDC funding, built a new state-of-the-art steel mill at Saldanha (Ispat Iscor, 2004; Hallowes and Munnik, 2006).

In 1998, the troubles at Iscor were compounded by the ‘Asian Crisis’, which saw global steel markets plummeting. In 2001, Iscor was strategically unbundled into steel production (remaining as Iscor) and mining (Kumba Iron Ore) but still, the future of the company was not assured. With the possible demise of Iscor, the South African government brokered a rescue deal with the international steel magnate, Lackshmi Mittal. In 2001, Mittal’s LNM Holdings took a 35 per cent share in Iscor, becoming a majority shareholder in 2004 (Hallowes and Munnik, 2006). A period of corporate restructuring followed, with Iscor renamed as Ispat Iscor Ltd, and then Mittal Steel Company NV. In 2006, the French

50. The average annual population growth for the period 1980–1985 was 1.29 per cent for Vereeniging, and 3.44 per cent for Vanderbijlpark. The figures for 1985–1991 were 4.07 per cent for Vereeniging, and 3.07 per cent for Vanderbijlpark (Simkins, 2010).

51. On 3 September, the new tricameral parliament was opened in Cape Town, with representation for white, coloured and Indian people, but excluding black Africans. This provoked the Vaal Civic Association to organise boycotts, stayaways and protests. Violence in the Vaal townships continued into the early 1990s, with civil conflict between supporters of the ANC and the IFP, including the Boipatong massacre of 1992, in which 42 township residents were killed by supporters of the IFP living in hostels.

52. See the statement by the Khulumani Support Group, 4 September 2012. Online at http://www.itweb.co.za/index.php?option=com_content&view=article&id=58219.

53. Sasolburg was the only parliamentary constituency where the HNP ever gained a seat. The HNP was even more extreme than the Conservative Party.

54. See the ArcelorMittal website: <http://www.arcelormittalsa.com>

“While major concerns remained, Sasol was however able to improve its environmental record by piping natural gas from Mozambique, partially replacing the use of coal as feedstock.”

steel giant, Arcelor, announced its decision to merge with Mittal Steel,⁵⁵ with the new transnational giant being named ArcelorMittal, and the South African subsidiary named ArcelorMittal South Africa (ArcelorMittal SA).⁵⁶

ArcelorMittal SA began well as global steel prices reached an all-time high in 2004, with expanding demand from China offering a new era of growth. The steel market proved volatile, however, as demand slumped in the wake of the 2008 global crisis. The production of liquid steel at the Vanderbijlpark works dropped dramatically from nearly one million tons (997 000 tons) to just under half a million tons (428 000 tons) (ArcelorMittal, 2012). The share price of ArcelorMittal SA dropped dramatically from around R250 a share in 2007, to R70 in 2008.

The economic turbulence through the 1990s and 2000s led to a contraction of the economy in the Vereeniging-Vanderbijlpark complex, which now fell under the Sedibeng District Municipality and the Emfuleni Local Municipality. Through this period, and up until 2008, the economy of the Sedibeng District Municipality had largely been tracking changes in the national economy, but with a slower growth rate. The 2009 recession was, however, experienced far more severely in Sedibeng than nationally, as the market for steel is highly sensitive to growth fluctuations. Whereas the national economy experienced a slight contraction in 2009 (-1.5 per cent) the contraction for Sedibeng’s economy was severe (-7.6 per cent).

Urban Econ (using Quantec data) calculated a 6 per cent decline in the value of manufacturing at constant prices between 2006 and 2011, with other sectors showing only marginal growth (Sedibeng District Municipality, 2012).

Vereeniging had surprisingly high levels of population growth in the 1990s⁵⁷ but this was largely because Orange Farm, an area of large-scale state-subsidised housing development, despite its spatial and economic marginality, was incorporated into the municipal area. Vanderbijlpark’s population grew modestly in the early 1990s, but then contracted sharply during the period 1996–2001, with an annual change of -7.29 per cent. Vanderbijlpark, the town most directly dependent on ArcelorMittal employment, was most severely affected by re-engineering processes. Simkins (2010) reports that population growth in the Vaal was nearly stagnant in the period 2001–2007, with population growth for Sedibeng municipality only 0.1 per cent, per annum, in this period. The 2011 Census also indicated marginal growth. However, there were differences within the Vaal Triangle, with population growth continuing in Sasolburg and Zamdela township, and some growth in the towns of Vanderbijlpark and Vereeniging as well, but real decline in the populations of Sebokeng, Evaton and smaller townships.

While the Vereeniging-Vanderbijlpark complex has had a turbulent recent history, Sasolburg continued to expand as an integrated chemical-manufacturing complex. Sasol lost its direct state

55. Mittal Steel was an amalgamation of Ispat International and LNM Holdings.

56. ArcelorMittal website: <http://www.arcelormittalsa.com/Portals/0/The-History-of-ArcelorMittal-South-Africa.pdf>

57. 7.53 per cent per annum for 1991–1996, and 12.61 per cent per annum for 1996–2001 (Simkins, 2010).



Photograph by Brian Boshoff (Sasolburg is still growing)

support in 1999 when the mechanisms of the Fuel Equalisation Fund, which supported Sasol during periods of low oil prices, were phased out, but it maintained a competitive advantage through its access to a private supply of cheap coal (Hallows and Munnik, 2006).⁵⁸ More importantly, the newly privatised Sasol went global, creating a web of partnerships with major international players in the petrochemical and chemical industries such as ChevronTexaco, Total and Mitsubishi, and listing on the New York Stock Exchange in 2003. While much of Sasol's expansion was international – in Mozambique, Nigeria, Australia, and the United States – there was significant new investment in Sasolburg. In the 1990s and into the 2000s, both Sasol and Karbochem expanded wax production, with Sasolburg being referred to as the emergent “wax capital of the world” (*Engineering News*, 23 May 2003). Later plans aimed to double the already significant wax production capacity (*Engineering News*, 16 April 2014). In 2010, Sasol began construction on its own gas-fired power-generating plant that would ensure at least 60 per cent self-sufficiency for Sasolburg, and in the same year, approval was granted for construction of a new ethylene purification unit in Sasolburg (*Engineering News*, 22 November 2010).⁵⁹ The risks remain, however, as the future of Sasolburg rests largely on boardroom decisions within Sasol that are

largely beyond the ability of the local council, or local communities, to influence.

During this turbulent decade, environmental issues moved centre stage. There was, for example, the protracted ‘David and Goliath’ battle over the alleged destruction of so-called Steel Valley by soil, groundwater and air pollution from the ArcelorMittal plant. By the late 1990s, many of the 600 small-scale farmers in Steel Valley had abandoned their allegedly poisoned land, but a handful remained, establishing the Steel Valley Crisis Committee and forming an alliance with other environmental protection groupings nationally in a bitter struggle to compel ArcelorMittal to meet its environmental obligations (Fourie, 2014). Sasol had also come under increasing scrutiny from environmental groupings. Around 2002, the Sasolburg Air Quality Monitoring Committee was established, which joined up with civic action agencies in areas across South Africa affected by industrial air pollution (*Mail & Guardian*, 9 October 2003). Sasol was also criticised for its contribution to greenhouse gas emissions, and in 2009, Earthlife Africa led climate protests in Sasolburg (Earthlife Africa, 2009). While major concerns remained, Sasol was however able to improve its environmental record by piping natural gas from Mozambique, partially replacing the use of coal as feedstock.

58. There was also ad hoc support from government including a major investment from the IDC in the 865 km gas line from the Mozambique gas fields to Secunda.

59. See the Sasol website for updated information, www.sasol.co.za.

The current woes (and some glimmers of hope)

There was a partial recovery in the steel industry from 2009 to around 2012, but since then, there has been steady deterioration. The tough reality is that South Africa is a marginal player in the global steel market, and is pummelled by external forces. South Africa produces around 6.4 million tonnes of steel per annum, compared with the 1 640 million tonnes produced globally, and the 804 million tonnes produced in China (World Steel Association, 2016).

When China's manufacturing and construction industries were booming, the massive production in China was not even adequate for local demand, and global steel prices increased. However, as China's industries slumped, Chinese steel producers turned to export markets to sell surplus production. In three years, Chinese exports doubled to 107 million tonnes, which is more than total US annual production. By mid-2015 there was a 240-million-ton oversupply of steel on world markets (World Steel Association, 2016). As cheap Chinese-produced steel flooded international markets, the viability of many steel producers was thrown into question. In 2015, for example, United States Steel cut 5 000 jobs and warned that thousands of others are at risk. (*The New York Times*, 3 May 2016). In the UK, Tata Steel announced the sale of its steel plants in South Wales putting 15 000 jobs at risk.

The largest steel company in the world, ArcelorMittal, announced an annual loss of nearly \$8 billion in February 2016. This is, of course, the mother

company to ArcelorMittal SA, which also experienced a severe slump. In July 2015, following a 1 400 per cent increase in loss per share in the six months to June, ArcelorMittal SA raised the possibility of plant closure and entered into emergency talks with government (*SABC News*, 24 July 2015). By mid-2015, ArcelorMittal SA had a share price of only around R10, a tiny fraction of what it once was, while the declared value of ArcelorMittal SA had reportedly collapsed from R60 billion at the height of the commodities boom in 2007, to little more than R5 billion in mid-2015 (*Business Times*, 12 July 2015). Facing job losses of around 30 000, including 7 000 at Vanderbijlpark, the National Union of Metalworkers (NUMSA) entered the fray, placing pressure on government to intervene (*SABC News*, 24 August 2015). In September 2015, South Africa's second-largest steel producer, Evraz Highveld Steel and Vanadium, based in Witbank on the Mpumalanga highveld, went into business rescue, and there were reports that ArcelorMittal SA was on the brink of closing its Vanderbijlpark plant (*Business Day*, 1 September 2015). At year end, ArcelorMittal SA announced an R8.5 billion loss, compared with a R158 million loss in 2014 (*IOL*, 16 March 2016).

In November 2015, under immense pressure, the South African government agreed to place a 10 per cent tariff on some steel imports and considered the possibility of ensuring that only local steel is used for state-funded infrastructure projects (Bloomberg, 6 November 2016). The tariffs were welcomed, but it was not certain whether they would work as it was said that Chinese imports were coming in at 25 per cent cheaper

"There was a partial recovery in the steel industry from 2009 to around 2012, but since then, there has been steady deterioration. The tough reality is that South Africa is a marginal player in the global steel market..."



Photograph by Gareth Pon

than the cost of production in South Africa (*Mineweb*, 3 September 2015). There was bad news in February 2016 when Evraz Highveld Steel and Vanadium announced it was closing shop (*Engineering News*, 5 February 2016), and in March 2016, around 2 000 steel workers received retrenchment letters (*Witbank News*, 3 March 2016).

By April 2016 there were mixed signals from global steel markets. There were intense, although still ongoing, discussions at international level, and, at best, preliminary signs of reduced production in China. However, 2016 was still looking to be a tough year, but with some hope of recovery in 2017 (World Steel Association, 2016).

The situation was not as dire across the Vaal River in Sasolburg. The low fuel price had knocked 24 per cent off Sasol's earnings, but the company was proving to be fairly resilient. As Sasol leaned more towards chemicals, it had become less dependent on oil-price fluctuations (*Engineering News*, 23 October 2015). With continued expansion of the petrochemical and chemicals complex, Sasolburg was in a relatively privileged economic position, and the communities living in and around the town had something to defend. In 2013, the proposed merger of Metsimaholo Local Municipality (Sasolburg) with the poorer Ngwathe Local Municipality (Parys) provoked violent protests in Sasolburg's Zamdela township (*Business Day*, 30 January 2014).

While the steel industry has been turbulent, the Vaal has seen expansion in other industries. Since 1951, Meyerton has been the site of the Samancor (previously Amcor) metalloy plant. In 2013, with the support of the DTI Tax Allowance Programme, Samancor invested R1 billion in a large new furnace at the plant to enable its strategic global partner, BHP Billiton, to beneficiate the manganese ore it mines in South Africa (*Mining Weekly*, 6 March 2013). In Walkerville, a cluster of

small holdings north of Meyerton,⁶⁰ the Dutch brewer, Heineken, invested R3.5 billion in a mega brewery in partnership with Diageo Highlands and Namibia Breweries Ltd. Heineken explored the possibilities of investing in the metropolitan municipalities of Gauteng, but was finally attracted to Walkerville by the availability of large tracts of land and the quick approval process offered by the Midvaal Local Municipality. The brewery opened in 2010 (Erasmus, 2010).

Retail has been a visible growth sector although some of the apparent growth may have come from the shift in activity from the historical CBDs of Vereeniging and Vanderbijlpark, which are experiencing various degrees of decay and dilapidation (Sedibeng District Municipality, 2011), to new large malls on the edge of the towns and in the townships. The newly-developed malls include River Square Centre (39 322 m² GLA) and Sebokeng Plaza (11 379 m² GLA) in Vereeniging, and Vaal Park (18 500 m² GLA) and Vaal Mall (48 000 m² GLA) in Vanderbijlpark (FGX Studios, 2013). There is also anticipated growth in the high-end residential sector, with the planned development of Vaal River City ('hydropolis'), a R4 billion investment in residential and commercial development, with infrastructure planning initiated in March 2015. However, the continued success of retail and residential development will be strongly affected by developments in other sectors of the economy, including steel.

Conclusion

The well-established pattern is of a large metal-producing complex around Vereeniging and Vanderbijlpark that is buffeted by the extreme volatility of the global steel market, and a smaller petrochemicals cluster around Sasolburg that continues to expand and produce profits, but which

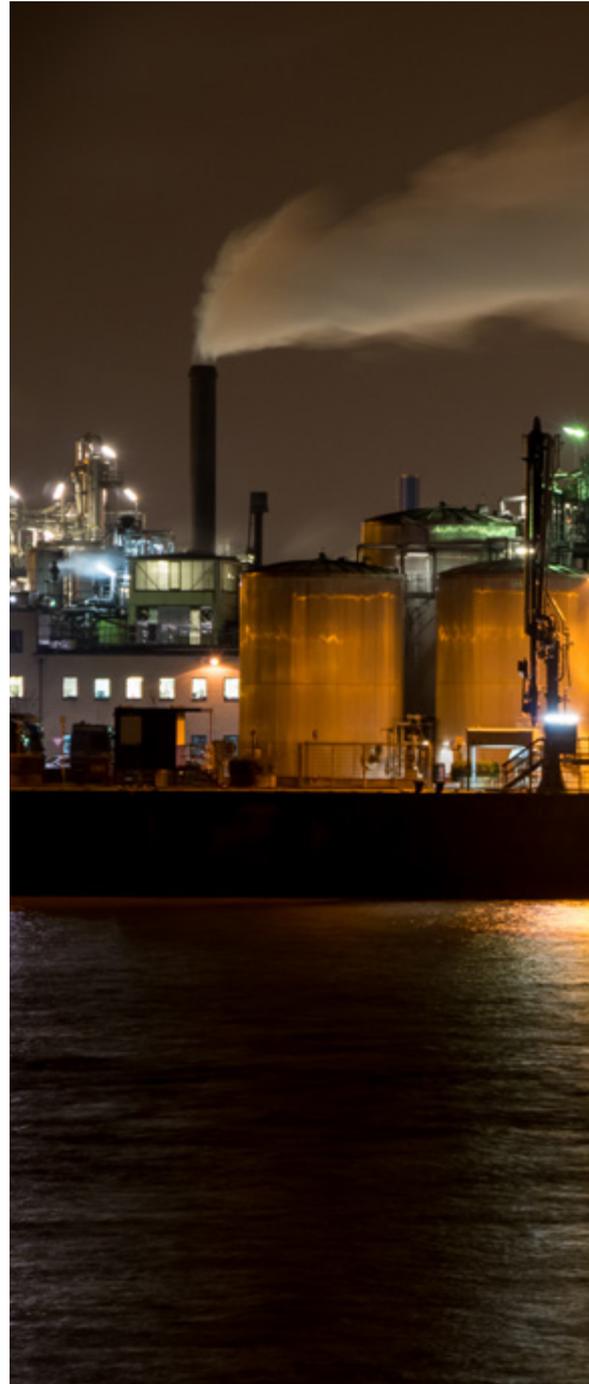
60. Walkerville is roughly halfway between Vereeniging and Johannesburg, within the jurisdiction of the Sedibeng district municipality and Midvaal local municipality.

is highly capital-intensive and is not a major job creator. On the margins of the Vaal Triangle, there are points of growth – Meyerton and Walkerville – where individual companies have invested heavily to benefit from local institutional and geographic qualities.

The major lessons come from the long trajectory of history. This is a district where the state has driven growth through direct investments in infrastructure and manufacturing. However, the state's locational decisions followed strategic investments and manoeuvres of a brilliant private entrepreneur, Sammy Marks, who knew how to draw in the patronage of the state. By the 1970s, the Vaal Triangle was massively dependent on state-owned industry. The main challenges came in the 1980s, when economic ideologies shifted away from the acceptance of an interventionist state, and when economic growth, which provided the demand for the products these industries produced, faltered.

The withdrawal of the state from these industries had mixed outcomes, even within the Vaal Triangle. The steel-making complex was severely affected by the rationalisation that followed privatisation and removal of protective subsidies, but even in this case, it was the state-brokered deal with transnational industry that ensured its survival. Sasol was far more successful than Iscor in managing the transition from state to private ownership, becoming a global player, but also continuing to invest in Sasolburg, its home base. The new growth that has emerged at points in the Vaal Triangle in recent times has been led by the private sector, but plainly facilitated by the state – through the tax incentives of the DTI in the case of Samancor, and the active support of a municipality in the case of the Heineken brewery.

The patterns of development seem set for the foreseeable future – at best, the Vaal Triangle may be an area of moderate growth, but with volatile swings in its economy. The new vision for the district may have positive spin-offs over the longer term, but the key question is how the ambitious plans for new residential development in the area will relate to economic change. Will the Vaal Triangle return to growth or will new development lead to expanded dormitory towns, with increased long-distance commuting to the metropolitan core?





Photograph by Dustin Hackert

4. Revisiting the decentralised growth points

(Babelegi and Bronkhorstspuit)

4.1 Industrial decentralisation as context

The immediate context is the legacy of the apartheid government's policies of industrial decentralisation. At one level, this experience of industrial decentralisation is idiosyncratic, closely related to Verwoerdian dreams of 'grand apartheid'. At another level, however, industrial decentralisation policies were common to a number of countries internationally, and the outcomes and legacies of decentralisation policies in South Africa may contribute to a wider understanding of the longer-term impacts of now abandoned regional industrial policies.

South Africa's programme of industrial decentralisation was driven mainly by ideological and political objectives, but it was partly rationalised in terms of a global discourse on 'regional balance'. The Tomlinson Commission Report of 1955,⁶¹ argued for the decentralisation of industry to selected sites within the African homelands, to ensure the economic viability of these entities. Verwoerd, however, would not accept the notion of 'white investment' within the homelands, and in 1960, introduced a 'border industry' programme. White industrialists received incentives to locate within a range of "thirty miles of Bantu areas", requiring Africans to commute daily across the border into "white South Africa" (Harrison, 1998).

The approach was unsuccessful. As Bell (1984) observes, the percentage of manufacturing employment in major industrial centres actually increased between 1956/7 and 1965/6 from 79.6 to 81.9. This forced a rethink and the Promotion of Economic Development of the Homelands Act, 1968, allowed for the introduction of white-owned business into the homelands on an agency basis, meaning that white industrialists could not own land but had reasonable tenure security through a leasehold

system. The first of the industrial growth points *within* a homeland was Babelegi in Bophuthatswana, which opened in 1970. This change in policy marked a turning point. Bell (1984) refers to a decline in the employment concentration in the major industrial centres from 81.9 per cent in 1965/6 to 76.9 per cent in 1978/9.

There was a further policy shift in the early 1980s as P.W. Botha's reformist and pro-market administration concentrated incentives in a limited number of industrial points with proven potential, including those on the edges of major metropolitan agglomerations (which become known as deconcentration points). The incentives were also restructured to reward profitable enterprises. The decentralisation process gained momentum in the 1980s, with the percentage of industrial employment in decentralisation/deconcentration points doubling, and notable success in places like Isithebe, Newcastle/Madadeni and Ladysmith/Ezakeni in KwaZulu-Natal; Phuthaditjhaba and Qwa Qwa in the homelands around the Free State; and Babelegi, Bronkhorstspuit-Ekandustria, Rosslyn, and Brits in present-day Gauteng. A significant shift was the relocation of labour-intensive manufacturing from East Asia, and especially from Taiwan, into the South African periphery (Hart, 2002).

Despite this apparent success, there was a growing critique of the decentralisation policy as an economically inefficient and ineffective programme. State incentives were criticised for distorting locational decision-making and for creating growth points that were not sustainable (for example, Urban Foundation, 1991). There was a counterview to this classically liberal argument which drew on radical thought on the expansion of capitalism, which argued that South Africa's regional policy actively supported the interests of industry, assisting firms in moving

61. Officially known as the *Report for the Commission for Socio-economic Development of the Bantu Areas within the Union of South Africa*.

to low-cost production sites where land and labour was cheap. Bell (1984: 15) refers to “spontaneous industrial decentralisation” which was facilitated by, but not dependent on, the state’s industrial incentives. This early assessment was followed in the 1990s by other contributions that argued that regional industrial policy had enabled industry to survive the prolonged recession of the 1980s by enabling the move to low-cost locations, and had produced a mixed bag of outcomes, including both greater levels of labour exploitation, but also new opportunities for certain categories of workers such as unskilled African women in spatially marginal areas (Jaffee, 1988 Rogerson, 1988; Pickles, 1991; Platzky, 1992; Todes, 1998).

Even as these scholars were pointing to unforeseen (possibly) positive outcomes, industrial decentralisation policies were abandoned.⁶² The concern with regional balance was not entirely lost, however, with post-apartheid Spatial Development Initiatives (SDIs) (for example, the Maputo Development Corridor (MDC), Industrial Development Zones (IDZs), and Special Economic Zones (SEZs) promoting development outside the major metropolitan regions (Todes, 2013).

With the policy shift, scholarly interest in the historical industrial development points waned. There was some reference to the varied fates of these areas in the media but there has been no systematic scholarly analysis. As a result, we have little understanding of the legacy of the apartheid-era investments in decentralised industry. The few available studies do point to a significant decline in places, but have these points collapsed? Phalatse (2000, 2001) writes of “abandoned industrial spaces” in the Mogwase industrial area in North West Province, and of the effects of the disappearance of industry on the lives of the women who previously worked in the factories. Greg Mills describes the decline of Dimbaza in the former Ciskei homeland: “The Dimbaza industrial park wilted and died. Today, there are just three

factories operating where once there were 200. Many buildings have been picked clean, like *vrot* animals in the veld. The railway has stopped running” (*Mail & Guardian*, 17 June 2011).

The inopportune coincidence of the withdrawal of incentives, trade liberalisation, accelerated urbanisation, and severed relations with Taiwan, most likely explains this decline, although there are differences in the sparse literature over which factors are most important. Without a systematic study of former growth points there is little basis for comparison. Did some places avoid the worst because of real locational advantage? Did some places decline but revive in later years? These questions prompted us to explore the experience of the former homeland growth points on the edge of Gauteng, using Babelegi and Bronkhorstspuit (including Ekandustria and Ekangala) as our case studies.

4.2 The Babelegi story

Introducing Babelegi

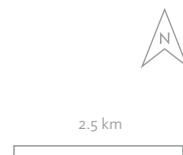
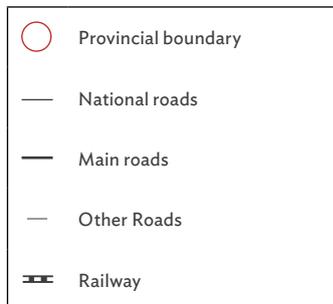
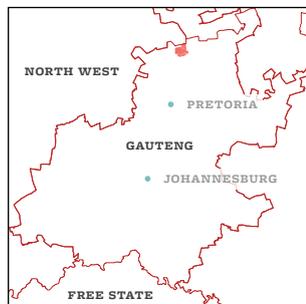
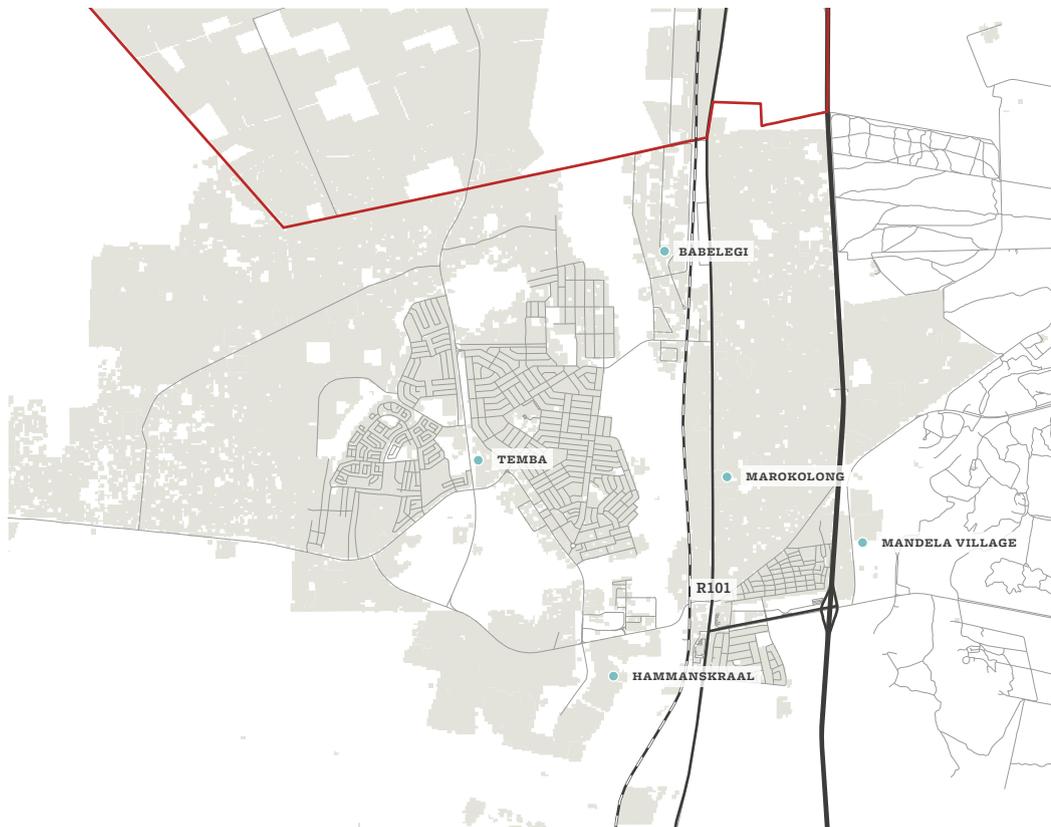
Babelegi is an industrial estate that was established under apartheid in the Bophuthatswana homeland. It is surrounded by a complex of formal and informal settlements, including Hammanskraal, Temba, Ramotse and Mandela Village. It lies 56 km to the north of Pretoria, in Gauteng Province, having been transferred from the jurisdiction of North West Province. Since the inter-provincial transfer, it has fallen under the Tshwane Metropolitan Municipality. It is close to the N1 and also a provincial road, but its rail access was recently terminated.

In 2011, the urban complex immediately around Babelegi had a population of 102 917, 25,3 per cent greater than the population of 82 083 in 2001. The major concentrations of people were in Temba (58 434), Hammanskraal (21 434) and Ramotse (15 760). With a 2013 GVA of R3.8 million, the measured economy is small, dominated by retail, followed by manufacturing.

62. The decentralisation programme was significantly downgraded in 1991 and then abolished in 1996.

Figure 76: Locating the Babelegi-Temba-Hammanskraal complex

MAP PREPARED BY Miriam Maina



Homeland development and displaced urbanisation

The story of Babelegi is inextricably tied to the homeland policies of the apartheid-era South African government. Bophuthatswana was formalised as a homeland for the Tswana-speaking people in 1961, and in 1977 became the second of South Africa's homelands to accept 'independence'. The need to secure an economic base for these homelands was a key driver of the industrial decentralisation programme. The development of Babelegi, in particular, was intended as the economic base of the Moretele-Odi block of Bophuthatswana, which was the closest to the metropolitan cities of the PWV. This was a site of displaced urbanisation, with a complex mix of rural densification, peri-urban development, and resettlement townships (Rogerson, 1974; Van Huyssteen, 2001; Van Huyssteen et al., 2010; Tiro, 2014).

Impressive growth in the 1970s and 1980s

The development of Babelegi began almost immediately after the promulgation of the Promotion of Economic Development of the Homelands Act, 1968, with the layout and physical infrastructure of the estate being completed by 1970. There were ambitious plans for industrial employment of 40 000 by the year 2000, and Babelegi did, in fact, develop quickly. In 1970, the first ten factories, employing 1 370 workers, opened their doors. The number of workers increased to 8 300 in 1977; 14 500 in 1982; and 17 000 in 1994 (Wellings and Black, 1986; Die Beeld, 19 June 1994; Tiro, 2014). Babelegi was the most successful industrial development point within a homeland, and was the only homeland growth point where investment by private capital exceeded that by the homeland development corporation (Wellings and Black, 1986).

Babelegi, like other growth points, had the advantage of low cost, non-unionised labour and generous state support for industrialists. It was reported, for example, that an entry-level wage in 1971 for a beginner in a clothing factory was R3 a week, far lower than the R7.50 set down by the Industrial Clothing Council of the Transvaal, while the Industrial Conciliation Act, which regulated labour conditions, was effectively suspended in the

homeland (*Rand Daily Mail*, 29 October 1971). The incentives included low interest on loans to finance assets, cheap factory leasing rates, assistance with relocation costs, transport subsidies and tax rebates (Wellings and Black, 1986). In these respects, Babelegi was no different from the other growth points. But it had the considerable additional advantage of relative proximity to the metropolitan cities of Pretoria and the Witwatersrand, and good links via road and rail. Nevertheless, while low-end manufacturing dominated in Babelegi, with businesses taking advantage of low labour costs and generous incentives, there was also higher-end industry, including component manufacturing for the emergent motor vehicle cluster around Pretoria (Wellings and Black, 1986).

As Babelegi grew, so did Temba and other settlements in the broader urban complex emerging around Hammanskraal. Tiro (2014: 25) reflects with an edge of nostalgia, and a sense of irony, on this development:

While Temba predates the industrial estate, it is at the same time its product ... Things got even better for the Temba residents when Babelegi was established. The most vivid and abiding memory of the time is that of the buzz in the streets, with masses of people walking to and from work, taxis hooting for passengers and buses rumbling past in the mornings. These are the days that seem to evoke melancholy among locals and make them muse over the good olden days. The irony is not lost on me as this was at the height of apartheid.

The 'independence' of Bophuthatswana in 1977 was a further boost to the growth of Babelegi. This industrial estate was one of the economic flagships of the homeland government, and received strong support from the Bophuthatswana Development Corporation.

Wind down in the 1990s

The crunch came with political change in the mid-1990s when Bophuthatswana was re-incorporated into South Africa. The new ANC-led government withdrew the incentives which had supported industry in the homelands, and also sharply reduced tariff protection for industries such as clothing, textile and footwear, in line with the new obligations that

“The first to leave were the fly-by-night operators who had little interest in the location apart from the low wages, high labour subsidies, and tax holidays.”

followed South Africa’s membership of the World Trade Organisation (WTO) in 1994. Industries in Babelegi thus suffered a double blow, with Taiwanese-owned industries also being hit by the severing of diplomatic relations between South Africa and Taiwan in 1997.

Babelegi declined sharply. The first to leave were the fly-by-night operators who had little interest in the location apart from the low wages, high labour subsidies, and tax holidays. The North West Development Corporation (NWDC), which took over the administration of the estate from Bophuthatswana, reported that 6 050 workers were employed in Babelegi in June 2012, sharply down from the peak of 17 000, and that only 86 of the 325 sites in the estate still had a functioning enterprise (Tiro, 2014). This represented around one-third of the employment in the early 1990s but did not indicate total collapse,⁶³ unlike the case of Dimbaza in the Eastern Cape, for example, where only three of 200 factories remained open after the removal of incentives (Tiro, 2014). The NWDC’s financial reports indicate that Babelegi continued to turn a small profit for the provincial government (Tiro, 2014).

Nevertheless, for residents living in the greater Hammanskraal area, the loss of two-thirds of local industrial employment was calamitous. As Tiro (2014: 37) reports:

The residents have watched in horror as the industrial complex wilted and, to all intents and purposes, became something of a ghost town. Often an argument surfaces that under Mangope, who was president of Bophuthatswana from ‘independence’ in 1977 until 1994, things were better with Babelegi vibrant and jobs available as a result. The argument is simplistic but is difficult to dispel nonetheless ... Apart from a new multi-million-rand shopping mall and the odd school, clinic and new informal settlements, nothing of serious consequence has happened here

for some two decades – nothing that has brought any tangible joy for the 340 000-odd residents of this sprawling conglomerate of settlements, falling under the City of Tshwane municipality, surrounding Babelegi. If anything, things seem to have regressed. The ruinous condition of the area’s industrial estate best illustrates the state of affairs.

Although Tiro (2014: 37) paints a bleak picture of the decline of Babelegi, he also makes the comment that “all is not lost”. Some form of renewal is happening in Babelegi and this requires careful explanation. In the 1990s, even as Babelegi was in decline, a few large companies recognised possible competitive advantage in the estate. In 1999, for example, Tiger Wheels Ltd invested R315 million in a new plant in Babelegi, and the Swiss transnational corporation, Nestlé, bought a non-dairy creamer factory in Babelegi from a struggling company. These investments had very different outcomes though.

Industrial closures and renewal in the 2000s

The tale of the Tiger Wheels plant in Babelegi in the 2000s is grim and has been cited as an example of South Africa’s overall failure to compete internationally in the manufacturing sector (Ganley and Mills, 2011). Tiger Wheels started production of cast-aluminium automotive wheels on a small-scale in 1972, and in 1979 relocated its production facility to Babelegi. The company did well initially, but when it experienced difficulties in South Africa, it went global, buying out German and American companies that had their own production facilities, and opening a factory in Poland. By 2006, Tiger Wheels was one of the top ten alloy wheel manufacturers worldwide, with a peak annual production of 7 000 000 wheels, and an annual turnover of R3.8 billion. The company survived tough competition from expanding Chinese producers since the short, just-in-time lead times required by

63. There were claims, however, that the Babelegi estate reached a low point of only 2 000 workers (for example, Bloom, 2011).

South Africa's growing motor vehicle manufacturers favoured a domestic producer.⁶⁴ The trouble had already begun in 2000, however, when a key supplier, Richards Bay's aluminium smelter, stopped producing locally-sourced alloys that qualified for rebates in terms of the DTI's Motor Industry Development Programme (MIDP). With increased input costs, South African production sites lost much of their competitive advantage (*Die Volksblad*, 1 March 2000; Ganley and Mills, 2011).

Tiger Wheels reported that losses at its Babelegi plant were negating the profits the company was making elsewhere, with the unacceptably high reject rate identified as the main cause of the losses (Tiger Wheels, 2002). The reality was that the plants in Germany and the USA were also performing poorly, and it was only in low-wage, reasonably high-productivity Poland, that the company was doing well. Ganley and Mills (2011: 18) write that "an unskilled floor sweeper in Babelegi earned more than a graduate fresh out of university in Poland". Between 1999 and 2004, 400 workers were retrenched at the Tiger Wheels plant, and in 2004, there was an announcement of a further 700 retrenchments (NUMSA, 2004). In 2004, a national newspaper in India commented on the difficulties facing the company and what this indicated about South Africa:

It is hiring again, but not in South Africa, where one person in four is jobless. Instead, it has a new plant

in Alabama, is looking to open another in China and may expand its subsidiary's factory in Poland. South Africa's failure to keep jobs like that at home and to stimulate new ones is turning into one of the biggest disappointments of the post-apartheid era (*The Hindu*, 15 March 2004).

In 2007, Tiger Wheels' German subsidiary, ATS Beteiligungs, filed for liquidation, and this, together with continued losses at Babelegi and the USA plants, brought the firm to its knees. In July 2007, Tiger Wheels asked the JSE to suspend trading of its shares (*TMC News*, 17 July 2007). The Babelegi plant finally closed in 2008, with the company blaming a combination of low skills, high labour costs and local crime (Tiro, 2014). An international news report referred to this as a case of a South African firm exporting jobs to a more profitable non-South African location (*New York Times*, 13 March 2004).

The closure of the Tiger Wheels plant may have marked the lowest point in the history of Babelegi but there were positive changes in the offing. A key institutional change was a decision by the Municipal Demarcations Board in 2005 to redraw provincial boundaries, transferring Babelegi from the institutionally and fiscally weak North West Province, to the more powerful Gauteng Province. Babelegi became part of the Tshwane Metropolitan Authority in Gauteng at the time of the 2009 national and provincial elections.



Photograph by Brian Boshoff (Past its heyday? Babelegi industrial estate)

64. See <http://www.tiauto.co.za/about/our-history/>



Photograph by Brian Boshoff (Decline and functionality in Babelegi)

In anticipation of this change, the premier of Gauteng announced plans in his 2008 State of the Province address for the redevelopment of Babelegi, and in 2009, Gauteng Province identified Babelegi as one of its three industrial development zones (the others being O.R. Tambo International Airport, and Ekandustria, near Bronkhorstspuit) (Mashitile, 2008; Gauteng Province, 2010). By 2010, Babelegi was one of the priority development projects in the City of Tshwane, with the industrial estate receiving strong support in marketing and local management from the city administration. This was consistent with a strategic decision by Tshwane to prioritise the development of the far north of the metropolitan area, where a large proportion of its population is located, quite distant from the economic hubs of the city (Sisulu, Personal communication, 2013).⁶⁵ Also in 2010, Gauteng Province announced its intention to promote Babelegi as a future hub for energy-related industries (De Bruyn, 2010). The *Turnaround and Revitalization Strategy for the Babelegi Industrial Park* (2012), was developed for provincial government by the Council for Scientific and Industrial Research (CSIR)

(Beukman, 2012).

There does seem to have been a gradual improvement in fortunes since the incorporation of Babelegi into Tshwane. In 2006, Dutch immigrant Jack Wijker started small-scale production of Puma sports cars at Babelegi. Only a handful of cars are produced each year, for a small niche of motor enthusiasts, but the company's production is set to increase following the 50 per cent stake bought by the Shanduka Group associated with politician and business magnate, Cyril Ramaphosa (Braun, 2012).⁶⁶

In 2010, there was a R200 million investment by the Indian company, KLT Automotive and Tubular Products, which is a leading manufacturer of motor vehicle components. A production plant was built in Babelegi, with the support of South Africa's IDC, to service the Ford manufacturing plant in Silverton, Pretoria (*Mail & Guardian*, 19 April 2014). In 2012, the Pretoria-based company, Unica Iron and Steel, announced plans to build a new steel recycling plant in Babelegi. In 2013, the Chinese-owned Harvest Bags, supplier of woven and knitted vegetable bags, arrived in Babelegi, possibly indicating new interest from Chinese companies (Harvest Bags,

65. In terms of Tshwane's *Strategic Investment Attraction, Facilitation and Aftercare Strategy* investment applications in Babelegi may be fast-tracked (Chauke, 2011).

66. Puma was a Brazilian specialist car manufacturer that built cars from 1966 until roughly 1995, a period when high import tariffs effectively closed Brazil to foreign-built cars. Wijker's Puma Marketing Company imported Puma cars from Brazil into South Africa after 1986, and from 1989, having bought moulds for the 1973 Puma 1600 GTE, began local manufacture of the vehicle in Verwoerdburg (now Centurion) near Pretoria. Production in Verwoerdburg ceased in 2001, with limited production starting up again in Babelegi in 2006 (Braun, 2012).

“Recent developments strongly suggest a restoration of Babelegi’s good fortunes, although it is still early days. Without further investigation, it is difficult to disentangle the effects of new forms of state support, from the DTI and the municipality, from other factors.”

2013). The announcement of the extension of the gas pipeline from the Mozambique gas fields, from Secunda in Mpumalanga to Babelegi, also encouraged investor interest.

The largest recent investment was in 2012 when Nestlé opened two new factories in Babelegi with an investment of approximately R500 million, supported by the DTI through its Section 12I Tax Allowance Programme of the Income Tax Act. The DTI provided Nestlé with a R163.5 million tax allowance and R5 million skills development subsidy as part of an effort to revive the old decentralisation points (*The Sowetan*, 7 August 2012). Nestlé has had a long association with Babelegi, with a local reputation as the employer of choice, but the new factories represented a major upscaling in investment (Tiro, 2014). The two new factories – one producing a range of Maggi products (instant soups, stocks, sauces, seasonings and instant noodles) and the other, Cheerio and Milo breakfast cereals – were jointly opened in July 2012 by the global CEO of Nestlé, Paul Bulcke, and South Africa’s minister of Trade and Industry, Rob Davies (*Financial Mail*, 23 August 2012).⁶⁷

Recent developments strongly suggest a restoration of Babelegi’s good fortunes, although it is still early days. Without further investigation, it is difficult to disentangle the effects of new forms of state support, from the DTI and the municipality, from other factors. The DTI tax subsidy may well have been a deciding factor in the Nestlé investment, but it is unlikely to have been the only locational factor considered. Low factory rentals also count in Babelegi’s favour, and as Tiro reports (2014), Tshwane municipality played a key role in persuading KLT and

Nestlé to invest in Babelegi.

There are, however, still major challenges which detract from the perceived advantages of Babelegi and the initiatives of government. Beukman (2012) refers to a 2011 survey, which revealed that the three biggest perceived problems facing industrialists in Babelegi were the lack of security (first choice of 26 per cent of respondents), the high cost of transport (16 per cent) and poor service from the North West Development Corporation (NWDC), the agency which still managed the estate despite the formal transfer of administration to Gauteng Province (14 per cent).

Security clearly remains a concern, with the Temba police precincts ranking in the top ten of the 137 policing precincts in Gauteng Province in terms of crime rates. Crime includes brazen raids on factories by gangs of ten to twenty criminals, and frequent cable theft, which has worsened problems with power supply (Tiro, 2014). The long period of apparently poor management by the NWDC also provided the space for illicit activity to flourish *within* the industrial estate (Beukman, 2012). In 2011, the Hawks, South Africa’s crack crime-fighting squad, raided an industrial site in Babelegi and uncovered a platinum smuggling syndicate linked to mafia-style groupings in Italy (*New Age*, 28 September 2011). The problems with transport costs have been exacerbated by tolling along the N1 and N4, and the decommissioning of commuter rail to the area (Sisulu, Personal communication, 2013).

While the changes to provincial and municipal boundaries have seemingly contributed to Babelegi’s improved prospects, problems with management

67. Also see the Nestlé website, <http://www.nestle.co.za/aboutus/history>.

have not been resolved easily. Seventy-five per cent of the industrial land remains in public management, reflecting Babelegi's history as a growth point within a homeland where white industrialists were not permitted to own land. This may have inhibited industry from investing large amounts of 'sunk capital' in the area, and has left the estate vulnerable to poor management by public authorities (Beukman, 2012). Under better management, however, public ownership has advantages. It allows public authorities to influence the mix and direction of investment strategically, and enables the easy consolidation of industrial sites to attract large investors (Masango, Personal communication, 2013). The improvement in the management of Babelegi has taken time. Although provincial and municipal boundary changes made a positive difference, the assets on the land were only very gradually transferred to the administration of Gauteng Province, causing ongoing frustration for industrialists.⁶⁸

The renewal of Babelegi, even if only partial, offers some hope to the sprawling complex of formal and informal settlements adjacent to the industrial estate. As Babelegi has somewhat haltingly entered a possible new era of growth, there has been some development in the surrounding area, with large scale formalisation of informal settlements in the areas immediately surrounding the industrial estate.

In recent years, formal retail has emerged as a significant sector of new growth. While the informal sector has a long history in the area, a new trend has been mall development. This include three large malls – the Jubilee Mall (38 000 m²), Temba City Shopping Centre (18 000 m²) and Kopanang Mall (8 600 m²). These developments are positive in retaining retail spending in the locality, but may also be having a negative impact on local informal retail activity. In addition to retail, there is the anticipation of other sectors developing in the area with Hammanskraal identified as the potential site of a large new Business Process Outsourcing (BPO) centre, and for tourist- and culture-related developments (City of Tshwane, 2012a; Sisulu, Personal Communication, 2013).

There are signs of hope but the future of Babelegi remains uncertain. A large proportion of the Babelegi sites are still derelict and while provisional government is talking of a revitalisation programme, there are reports of new factory closures with job losses of up to 1 000 (*Pretoria North Rekord*, 21 January 2016). Violent protests in Hammanskraal in May 2016, which followed attempts to evict shack dwellers from land falling under a traditional authority, led to at least two deaths, and were a reminder of the severe social tensions in the area (*Sunday Times*, 24 May 2016).



Photograph by Brian Boshoff (Displaced urbanisation: a taxi rank in Hammanskraal)

68. In 2013, a national parliamentary study group visited Babelegi and was petitioned by a frustrated Babelegi Industrial Management Board, which told the parliamentarians that the land-ownership dilemma was the source of many of Babelegi's problems.

Conclusion

The Babelegi story is a complex one that does not conform directly to the narrative of artificially created industrial growth points in former homelands collapsing once state benefits are removed. The story is rather one of a growth point that emerged in a homeland because of a combination of state support and actual competitive advantage (low-cost labour in a location with reasonable access to the large Witwatersrand markets). It experienced decline, but not annihilation, once the benefits were removed. In the 2000s, institutional changes,

including incorporation into Gauteng Province and the Tshwane metropolitan area benefitted the industrial estate, as did new forms of support from national government such as the DTI tax benefits. There are once again sparks of growth in the area, including the investments by Nestlé. A key question is what these new or revived forms of economic activity may mean in the lives of such a large concentration of people living in this area of 'displaced urbanisation'. Other methods of analysis are needed to answer this question.



Photograph by Paul Parsons

4.3 Bronkhorstspuit (including Ekangala and Ekandustria)

Introducing the study area

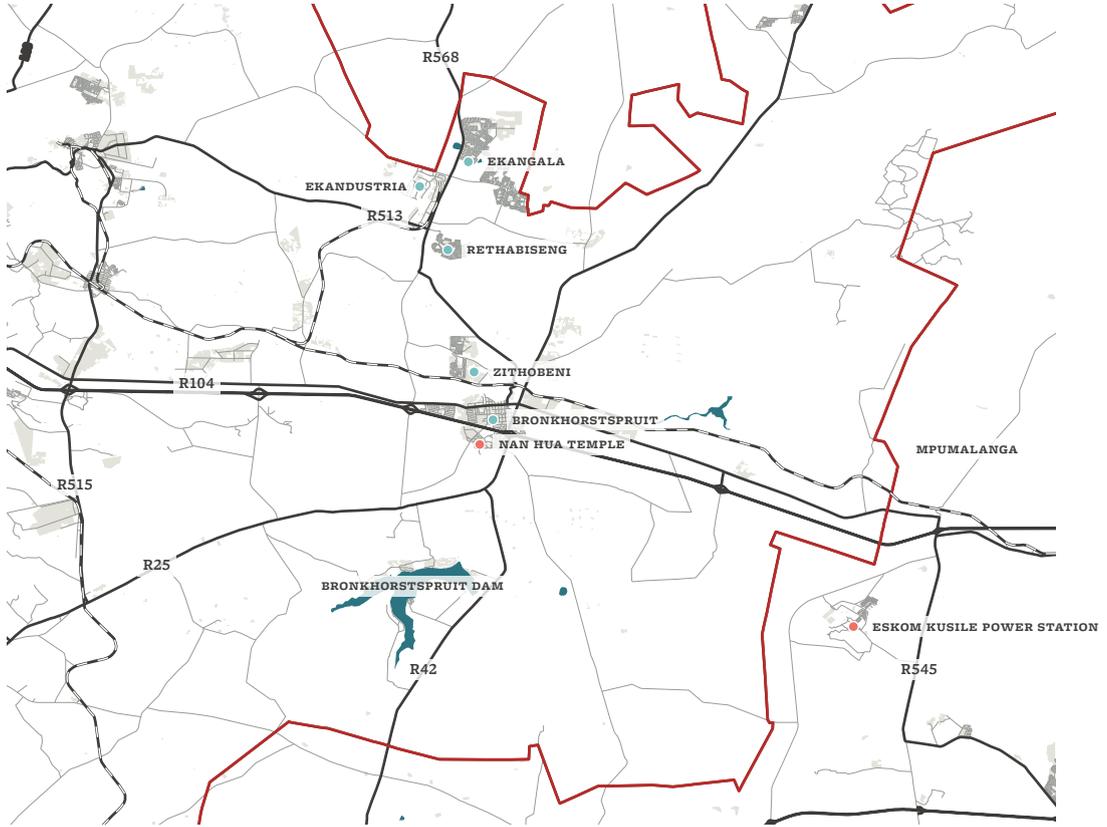
Bronkhorstspuit lies 61 km to the east of Pretoria, along the N4 East. Bronkhorstspuit was historically a small agricultural service centre, but under apartheid rule, the Ekandustria industrial estate was established to provide an economic base for the KwaNdebele homeland, and the townships of Ekangala, Zithobeni and Rethabiseng were established to house the people who worked in the estate and the town. In the post-apartheid era, the urban complex was initially fragmented institutionally with Ekangala falling under Mpumalanga and the remainder of the area within Gauteng. The entire area has since been consolidated within Gauteng, however. The area also initially fell under district and local municipalities,

but it has recently been incorporated into the Tshwane Metropolitan Municipality.

In 2011, the population of this urban cluster was 94 362, 50.6 per cent greater than in 2001, a significant growth. The major concentrations of people were in Ekangala (48 493), Zithobeni (22 435) and Bronkhorstspuit proper (12 468). A new middle-to upper-income extension of Bronkhorstspuit has developed around the Bronkhorstspuit Dam, close to the site of the construction of the Kusile power station. The local economy was relatively small, with a 2013 GVA of R8.2 billion. The largest sector was manufacturing, followed by retail, but this excludes the GVA produced from the construction of Kusile.

Figure 77: Locating the Bronkhorstspuit-Ekandustria-Ekangala urban complex

MAP PREPARED BY Miriam Maina



An obscure *dorp*

Before the 1980s, Bronkhorstspuit was a small agricultural service centre – an obscure *dorp* (small town). It had some sentimental significance for segments of the Afrikaner right wing as the site of the opening skirmish of the First Anglo-Boer War (1880–1881). The Bronkhorstspuit Dam was built in 1950, establishing the town as a minor weekend recreational centre for the Greater Pretoria region. There was a moment of fame on 17 September 1965, when international media reported the landing of an UFO outside the town.

During the second part of the twentieth century, the town stagnated. There was a slight increase in its contribution to the GDP of what is present-day Gauteng – from 0.17 per cent in 1970, to 0.24 per cent in 1981 – as agricultural productivity improved. But the population of the district declined, with mechanisation negatively affecting the market of this rural service centre (Simkins, 2010).

Part of the grand design

Changes came in the mid-1980s, with the declaration of an industrial decentralisation point, adjacent to Bronkhorstspuit, in support of the development of the new homeland of KwaNdebele. This homeland was said to be “an afterthought in the grand design of ‘separate development’” (Murray, 1987: 243). It didn’t exist before 1977, and after that, only in a very fragmented form.⁶⁹

Despite the miniscule size of KwaNdebele, the territorial authority opted in 1982 for national independence. To ensure the viability of the new state, the South African government tried to enlarge its territory from 98 000 hectares to 381 000 hectares by incorporating Moutse (previously part of Lebowa) and Ekangala township. The incorporation went badly with bitter resistance from the residents of these two areas. The plans were invalidated in 1989 by an Appeals

Court ruling (Truth and Reconciliation Commission, 1998) but by then, in any event, the entire homeland system was faltering.

The viability of the homeland depended on the establishment of an economic base. The Ekandustria industrial estate – alongside Ekangala township, north of Bronkhorstspuit – was established in 1984 by the KwaNdebele Development Corporation.⁷⁰ There were ambitious goals of developing an industrial economy that would support a city of around 300 000 people. This clearly was never attained but Ekandustria did have some early success. Within a year there were 22 factories (*New York Times*, 10 August 1985) and by 1991 there were 92 factories employing 10 000 people across sectors such as metal products, rubber and plastic, wood products, textiles, food, and chemical products (*Die Beeld*, 24 October 1991). As with Babelegi, there was the combination of generous incentives for industrialists and a supply of low-wage labour, as well as relatively good access to the large urban markets in Gauteng. Although there were fly-by-night operators, there were also significant industrial establishments such as Sasol Nitro,⁷¹ Steloy Castings, Marley Roofing and Elangeni Oil and Soaps.

Taiwanese investors, in particular, found Ekandustria to be an attractive location. By 1990, there were at least 17 Taiwanese-owned factories there (*Die Beeld*, 26 October 1990). The Bronkhorstspuit municipality did not rely on the activities of the South African and homeland government, and played an active role as a local authority in recruiting Taiwanese industrialists. The municipality sent official delegations to Taiwan, set up a Travel Agency in Taipei, and allocated a newly-established residential estate, Cultura Park, for Taiwanese residents (Hart, 2002).

In the period 1985–1991, there was modest population growth in Bronkhorstspuit (2.45 per cent per annum) after decades of population decline,

69. The Ndebele people were a small minority in the Transvaal, with most living in the Lebowa homeland or on white-owned farms, but in the late 1970s, a Ndebele chief seceded from Lebowa and persuaded the South African government to set up the KwaNdebele territorial authority.
70. There was a peculiarity in the design of the industrial estate as it was divided into northern and southern sections, with the northern section being in the KwaNdebele homeland, and the southern section in ‘white South Africa’. The northern section received subsidies in terms of the decentralisation programme and developed to 80 per cent capacity, but the southern section did not receive subsidies and only developed to 10 per cent capacity (City of Tshwane Metropolitan Municipality, 2012b).

71. The Sasol Nitro plant was set up as a partnership between Sasol Chemical Industries Ltd and the Australian company, Dyno Nobel, to produce organic chemicals used in the making of explosives.

suggesting the industrial decentralisation policy had some impact. The contribution of the locality to the economic output of present day Gauteng also trended upwards, from 0.24 per cent in 1981, to 0.31 per cent in 1994 (Simkins, 2010). This impact was negligible for Gauteng as a whole, but was locally significant.

Industrial decline in the 1990s but a local surprise

As with Babelegi, and for the same reasons, Ekandustria declined after 1994, with most of the smaller factories closing, although larger enterprises such as Sasol Nitro and Steloy Castings, which had sunk significant assets into the area, remained. Bronkhorstspuit was negatively affected and population growth for the period 1991–1996 was, once again, negative (Simkins, 2010). Taiwanese industry was severely affected by the changes. Not only did the Taiwanese investors lose the incentives, but they were also shaken when South Africa switched its diplomatic allegiance in 1997 from Taiwan to the People's Republic of China. Taiwanese industrialists closed their factories and sold off their residential properties in Cultura Park. The Taiwanese school in the suburb was sold to

provincial government.⁷²

The dalliance with Taiwan did, however, have a surprising outcome that persists to the present day. During an official visit to Taiwan in 1991, Bronkhorstspuit's municipal manager, Dr Hennie Senekal, met the Venerable Master Hsing Yun, head of the Fo Guang Shan Buddhist order,⁷³ who expressed his interest in establishing a religious and cultural centre in Africa. In March 1992, Senekal returned to Taiwan to sign a contract with Yun, donating 14 hectares of municipal land to the Buddhist order.⁷⁴ A Buddhist abbot was sent almost immediately to Bronkhorstspuit, and work began on a large religious complex which included the Nan Hua Temple, the Temple Guesthouse, the African Buddhist Seminary (ABS), the Nan Hua Village, the Assembly Hall, and the Pureland Ch'an retreat centre. This became the largest Buddhist centre in Africa and one of the largest, internationally, outside of China. This development played a key role in returning Bronkhorstspuit to growth after 1996. It was not welcomed by all, however. On 30 October 2002, there was a spate of bombings in Gauteng by members of the extreme right-wing Boeremag. There were bombings in Soweto, but also an explosion in the Nan Hua Temple which injured two security guards.⁷⁵



Photograph by Brian Boshoff (Religious economies: the Nan Hua Buddhist temple complex in Bronkhorstspuit)

72. See <http://www.culturahighschool.co.za/index.php/ct-menu-item-3>

73. This is a monastic order of the Pure Land and Linji Chan schools of the Mahayana Buddhist tradition.

74. See <http://en.nanhuateemple.org/history.html>

75. South African History Online, <http://www.sahistory.org.za/dated-event/boeremag-bomb-blasts-rock-soweto-and-bronkhorstspuit>, accessed 1 March 2015.

The Buddhist presence in Bronkhorstspuit also attracted other Eastern-inspired religious activity. In 2008, for example, the Oppenheimer family and the De Beers Corporation donated the 3 900 hectare Ezemvelo Nature Reserve to the Maharishi Institute, as a location for “a new green, consciousness-based, eco-village for southern Africa”.⁷⁶

New confidence in the 2000s

The industrial estate did not collapse completely. Sasol Nitro remained an anchor, and in 1998, a steel-casting company, PD Foundries, moved to Ekandustria. Together with the existing specialist stainless-steel foundry, Steloy, this formed the hub of a new metals complex (*Engineering News*, 19 February 1999). In 1994, Steloy acquired PD Foundries and moved its company headquarters to Ekandustria. It had become one of the largest privately-owned South African foundry groups, supplying over 220 different alloys to customers around the world (*Engineering News*, 11 April 2014).

From around 2008, there were signs of revival in the Ekandustria industrial estate, and as with Babelegi, this was at least partly related to institutional changes. In the post-apartheid era, Bronkhorstspuit-Ekandustria had initially fallen under the Metsweding District Municipality and the Kungwini Local Municipality. These were poorly-resourced local authorities that struggled to provide adequate planning and management for the area. In July 2008, the Municipal Demarcations Board took the decision to incorporate Metsweding, and its two local municipalities, into the jurisdictions of the Tshwane Metropolitan Municipality with effect from the date of the municipal elections in April 2011 (*Fin24*, 8 May 2011). There were also adjustments to the provincial boundary to correct a ‘technical error’ in the original demarcation process, which had placed Ekangala in Mpumalanga, separating it from Bronkhorstspuit and Ekandustria in Gauteng.⁷⁷ With the entire area in Gauteng Province and under the Tshwane

Metropolitan Council, the prospects for integrated development were significantly better. In 2008, the Gauteng government commissioned the preparation of a rehabilitation strategy for Ekandustria with implementation beginning in 2009 (*IOL News*, 17 February 2009). In 2012, Tshwane’s Metropolitan Spatial Development Framework (MSDF) identified Bronkhorstspuit-Ekandustria as a metropolitan node, affirming its new status within the region (City of Tshwane, 2012b).

These changes boosted confidence in the area. The largest new investment was a R1.4 billion fluorspar beneficiation plant in Ekandustria, with an estimated 1 200 jobs. The production facility, opened in 2014, was a direct outcome of the initiative the DTI launched in 2009 to counter South Africa’s growing trade deficit in chemical production by increasing the production of fluorochemicals (*Financial Mail*, 2 April 2012). In 2013, construction began on the Bronkhorstspuit Biogas Plant, positioning the locality as a participant in green economy initiatives (*Engineering News*, 16 April 2013). In 2014, there were reports of a Chinese company, Rayal Tiles, investing R600 million in Ekandustria, creating 1 000 jobs (*SABC News*, 29 January 2014). Smaller facilities such as an agricultural feeding mill, funded as a black-owned enterprise by the National Development Agency (NDA), have also been established (*SABC News*, 31 July 2012).

In early 2016, however, there were reports of high job losses in Ekandustria, including an alleged 430 jobs lost with the closure of the Plascon Paint plant. This was taken up as a political issue in local government elections campaigning.⁷⁸

Boom times (and some challenges)

While there are signs of new growth in the manufacturing industry, the current residential boom in Bronkhorstspuit is the direct result of the construction of the R118.5 billion Kusile power station 20 km east of the town in Mpumalanga (Eskom, N/D). This is one of the world’s largest

76. See <http://maharishiinstitute.org/academics/meru/>; <http://www.ezemvelo.co.za/donation-of-ezemvelo-nature-reserve-to-maharishi-institute-by-mr-and-mrs-oppenheimer/>.

77. The decision was taken to correct the error but there was a six-year delay in implementation, which led to institutional neglect of Ekangala, despite growth in the population, driven at least partly by the eviction of agricultural workers from farms in the area (Masango, Personal communication, 2013).

78. See Democratic Alliance video released on YouTube, <https://www.youtube.com/watch?v=DMZCHQwMoc>.



Photograph by Brian Boshoff (Real economies in Bronkhorstspuit)

current energy projects, and it is expected that, on completion, Kusile will be the world's fourth largest coal-fired power station, with a total installed capacity of 4 800 MW. The official go-ahead for construction was given in 2008, but there have been serious production delays, and the synchronisation of the first of the six 800 MW units with the national grid is now expected in 2017 (*Engineering News*, 20 February 2015).

Bronkhorstspuit provides a residential base for skilled technicians, professionals, and managerial staff on the Kusile construction site, and since 2008, there has been resultant growth in the middle- and higher-ends of the property market, including up-market townhouse developments in the town and at the dam, where there is an exclusive golf estate (*Property24*, 28 July 2008; *Property24*, 27 November 2009; Masango, Personal communication, 2013).⁷⁹ Retail has done well as a result of this boom. In 2010–2011, for example, the then Kungwini municipality approved 18 898 m² of shopping space.

By contrast, in Nigel, only 753 m² was approved, and in Merafong (including Carletonville) only 496 m² (FGX Studios, 2013).

The recent development of the area has not always proceeded smoothly, and there have been environmental costs. Within a year of incorporation into Tshwane, there were severe service delivery protests in Ekangala (and in the smaller townships of Zithobeni and Rethabiseng, nearer Bronkhorstspuit) that involved the torching of buildings including a clinic, library and local hall (*SABC News*, 5 February 2014; *IOL News*, 6 February 2014).⁸⁰ The mayor of Tshwane responded to the protests by indicating that his administration had plans to develop the Bronkhorstspuit areas as the “greater eastern capital” of the bigger capital city, and called for patience as incorporation proceeded “with some inconveniences and challenges” (*IOL News*, 6 February 2014).

The biggest of the environmental challenges has to do with the Kusile power station. Calculations

79. Bronkhorstspuit (then in the Kungwini local municipality) had the highest value of building approvals of all the case areas we studied, with the large majority of the applications for buildings of more than 100 000 m² (StatsSA, 2012).

80. Bronkhorstspuit's local development planning function and many of its other administrative functions were removed from the town and consolidated in the seat of the municipality in the Pretoria Central Business District. Facing the prospect of commuting long distances from Bronkhorstspuit to Pretoria, many civil servants who had been located in offices in the town resigned, and local institutional memory and experiential expertise of local conditions was lost.

indicate that Kusile will contribute an additional 30 million tons annually to South Africa's CO₂ load. Critics of the project are of the opinion that the damage cost of these emissions could have bought an equivalent power-generation capacity using renewable power generation technologies (Blignaut, 2012: 72). Although Kusile – and its sister, Medupi, currently being built in the Waterberg – are the first two power stations in South Africa to use technology that dramatically reduces sulphur dioxide emissions, they do further lock South Africa into its carbon-intensive growth path.

More locally, the development of a small chemicals and metal products hub at Ekandustria requires ongoing monitoring of environmental compliance. The extended period of weak local government after the ending of apartheid, resulted in local environmental problems with reports, for example, of raw sewage polluting the Bronkhorstspuit Dam, and levels of *E. coli* allegedly rising to between 300 and 2 000 times what is acceptable.⁸¹

Conclusion

The Bronkhorstspuit-Ekandustria-Ekangala story is also one of the complex, unanticipated, often surprising outcomes, of state strategy. Again, the

impact of the apartheid-era industrial decentralisation strategy cannot be understood simplistically. The establishment of Ekandustria as a growth point in the 1980s did support the growth of Bronkhorstspuit, and the removal of state support in the 1990s did lead to economic downturn, but the industrial infrastructure established at Ekandustria is at least partly underpinning a current revival in the fortunes of the town, nearly three decades later. The attempt to attract Taiwanese investors to the growth point in the 1980s also had an unexpected outcome – the construction of Africa's largest Buddhist centre, which has played a key role in the regeneration of the town. Much of the current development has to do with another form of state investment – the construction of a large, coal-fired power station 20 km out of town – and there has been a recent scramble for residential property in the town, which is also supporting the commercial and recreational sectors.



Photograph by Brian Boshoff (Blue bull country: a quiet Sunday in Bronkhorstspuit)

81. See <http://www.environment.co.za/poisoning-carcinogens-heavy-metals-mining/residents-tackle-the-bronkhorstspuit-dam-pollution.html>.



Photograph by Wikimedia

5. Recreational hubs on the edge (Hartbeespoort)

5.1 Nature on the edge

A number of writers have shown how the development of mining and industry in the late nineteenth and early twentieth centuries produced a 'crisis of value' for which a partial antidote was available in the 'primitive' or 'natural' spaces of the wild (Williams, 1975; Bunn, 1996; Brooks, 2005). There is a British and North American literature which identifies the 1920s and 1930s as an important period in an emergent 'ideology of recreation' (for example, Hays, 1998; Whyte, 2002; Cloke et al., 2013). In earlier years, leisure was the domain of the upper classes, but by the early twentieth century, more progressive social

policies and an expansion in transport infrastructure and technology, made leisure and recreation accessible to the urban middle and working classes. The natural landscape was no longer a place of pre-modern backwardness, but rather a place which offered both physical, emotional and moral benefits to the harassed urban dweller. The 1930s, in the UK, for example, saw the rise of the Scouts and Guides movements, ramblers associations, and cheap youth hostels, with the emergence also of the 'right to roam' movement. These trends were reinforced significantly after World War II with the rapid spread of the private motor

car, which made weekend trips into the countryside, for example, increasingly possible (Whyte, 2002; Cloke et al., 2013).

In South Africa, of course, these opportunities were mainly limited to white society. From the 1920s, game reserves and beaches emerged as places of recreation, but getting to these places required long journeys. There was an increasing demand for leisure spaces close to the large urban concentrations. Both Brooks (2005) and Bunn (1996) remind us of the histories of South Africa's natural spaces, showing how human activity created the enclaving of so-called natural space. The 'natural' spaces of recreation in Gauteng, are even more starkly human creations. The primary weekend recreational spaces in Gauteng are around the major and minor dams in the province that have recreational and nature reserves surrounding them, including the Vaal, Hartbeespoort, Bronkhorstpruit and Roodeplaat dams. Other 'nature areas' are relatively recent creations. The Pilanesberg Game Reserve, for example, was created from a number of former white-owned farms, with wild animals being brought in during the 1980s through a major game translocation programme called Operation Genesis.

We have selected Hartbeespoort as an illustrative case. A major recreational space was unintentionally recreated from a programme to resettle 'poor whites' on irrigated land. In later years, the 'natural quality' of the space was disturbed by a property boom around the dam, and also by major problems of pollution,

largely caused by upstream urban developments. The early story of Hartbeespoort Dam is also a striking illustration of the huge complexities of large state-led development. It is a story of political vacillation, financial overruns, technical snags, difficulties with land rights, natural disaster, and the unanticipated consequences of events within the national and global arenas.

5.2 The Hartbeespoort story

Introducing the study area

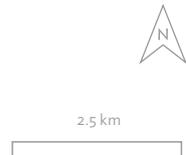
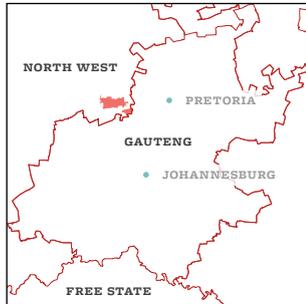
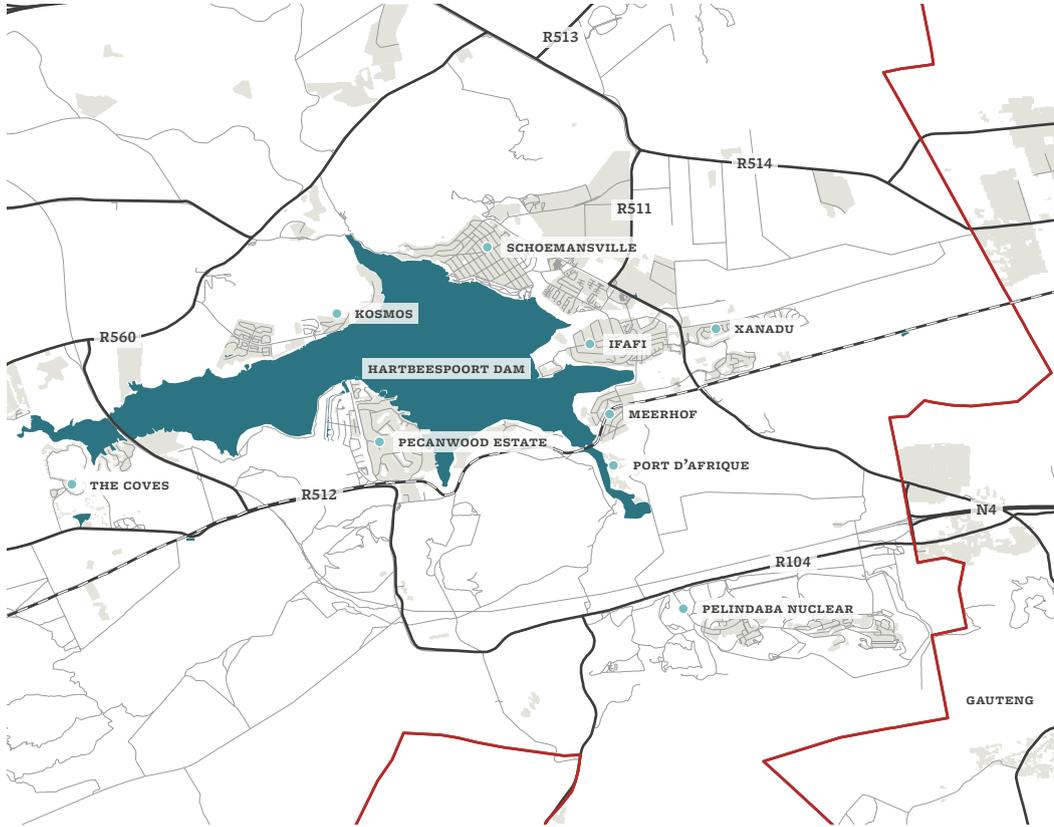
Hartbeespoort Dam was established in the 1920s for agricultural irrigation, but it has developed into an important regional recreational hub. The early settlements around the dam were Schoemansville, Kosmos and Meerhof, but there are now a number of upmarket estates such as Pecanwood, The Coves, and The Island Estate. The dam is only 36 km to the west of Pretoria, accessible along a provincial road, but it falls under the jurisdictions of North West Province, the Madibeng Local Municipality and Bojanala Platinum District Municipality.

The population around the dam in 2011 was 22 376, which was a 206.5 per cent increase on population of 7 300 in 2001. This reflected the effects of the property boom in the early 2000s. The major concentrations of people were in Schoemansville (3 627), Ifafi (2 571) and the Pecanwood Estate (1 618). The economy was predominantly based on retail and tourism.

“Hartbeespoort Dam was established in the 1920s for agricultural irrigation, but it has developed into an important regional recreational hub. The early settlements around the dam were Schoemansville, Kosmos and Meerhof, but there are now a number of upmarket estates such as Pecanwood, The Coves, and The Island Estate. ”

Figure 78: Locating Hartbeespoort

MAP PREPARED BY Miriam Maina





Photograph by Wikimedia Commons

State-led construction (and its complications)

There was interest in the construction of a dam on the Crocodile River from the time of the Zuid Afrikaansche Republiek. An influential local landowner, General Hendrik Schoeman, apparently persuaded President Paul Kruger to construct the dam for irrigation and local water supply but implementation was interrupted by the outbreak of South African War in 1899, and by the sudden death of the General in 1901 (Van Vuuren, 2008; Meyer, 2013).⁸² After the war, the Transvaal government investigated the viability of constructing a dam and agreed to a provisional implementation plan. There was another delay with the formation of the Union of South Africa in 1910, and resulting changes in institutional responsibility.

The political impetus for building the dam came around 1914 with the desire of the Botha-Smuts administration to appease the increasingly restive white labour, and counter the influence of General Hertzog's newly formed National Party. The Hartbeespoort Dam Act was passed hurriedly by the Union Parliament in 1914 with the intention of providing temporary employment to poor whites during the construction of the dam, and more permanent livelihood opportunities through

irrigated smallholder agriculture downstream of the dam (Verhoef and Du Plessis, 1990; Van Vuuren, 2008; Meyer, 2013).

Construction was planned to begin in 1915 but was delayed by the outbreak of World War I and also by difficulties in acquiring land. The local farmers were only prepared to sell their land at inflated prices and government was hamstrung by the lack of powers to expropriate land, a problem only resolved with the passing of the Hartbeespoort Irrigation Scheme (Acquisition of Land Act) in 1918. Even so, there were tough negotiations around land rights. Johan Schoeman, the General's son, for example, eventually relinquished his land only in return for all commercial and riparian rights on the water and foreshore, a legal provision which was to have important implications for future development (Van Vuuren, 2008; Meyer, 2013).

As World War I came to an end, soldiers returned from the front to a country in recession. The construction of the dam and the irrigation scheme provided employment for around 3 500 white men. In 1919, construction was delayed by strikes and other labour unrest although this problem resolved when the government threatened to employ African workers instead. In 1921, floods washed away much of the construction. A new engineer was appointed, the

82. General Schoeman died in 1901 when a lyddite shell he kept in his ashtray exploded after he dropped a match onto it while lighting his pipe (Meyer, 2013).

“The immediate purpose of the dam was to unlock the agricultural potential of the district, providing opportunities to poor whites (on 8 hectare plots) who would otherwise move into the cities. A major consequence of the development was the creation of a major recreational hub in easy access to the emerging metropolitan cities of Johannesburg and Pretoria.”

dam wall was redesigned, and construction proceeded rapidly. In 1923 the dam was opened, and in 1925 the full irrigation scheme was completed (Van Vuuren, 2008; Meyer, 2013).

The irrigation scheme involved a 544 km network of canals supporting 160 km² of irrigated land that produced tobacco, wheat, lucerne, fruit and vegetables. In 1924, this intensified agriculture led to the proclamation of the small agricultural service town of Brits, on the banks of the Crocodile River, north of Hartbeespoort. The immediate purpose of the dam was to unlock the agricultural potential of the district, providing opportunities to poor whites (on 8 hectare plots) who would otherwise move into the cities. A major consequence of the development was the creation of a major recreational hub in easy access to the emerging metropolitan cities of Johannesburg and Pretoria (Verhoef and Du Plessis, 1990).

The irrigation scheme had a difficult genesis, with complicated institutional conflicts surrounding it and a lack of adequate funding, but the pro-white labour Pact government, which came to power in South Africa in 1924, provided new impetus to the scheme. The small-scale farmers survived the effects of a collapse in the international tobacco price in 1928, and the Great Depression of the 1930s, and gradually worked their way to relative prosperity, with most of the farmers and their descendants

becoming landowners by the 1950s. Verhoef and Du Plessis (1990: 80) conclude that “[t]he Hartbeespoort Irrigation Settlement proves that the resettlement of socially and economically dislocated people can have very successful results”. They note, too, that the African farmers who were living along the banks of the Crocodile River were relocated to other areas, and were not provided the support given to the white settler farmers.

Property developments in the 1920s and 1930s (and slower growth through to the late 1960s)

The development of Hartbeespoort as a recreational hub owes much to the entrepreneurial scheming of Johan Schoeman, who developed the townships of Schoemansville, Kosmos and Meerhof along the dam shore. He ceded some of his boating and fishing rights to buyers of stands in these townships but he kept the commercial rights to himself until his retirement in the early 1950s.

Schoemansville was proclaimed in 1922 and developed as the largest settlement and business hub along the dam. This was followed by Meerhof (around the railway siding) in 1935, and upmarket and secluded Kosmos in 1937.⁸³ Schoeman’s son, Lincoln, later developed the township of Ifafi. The stand holders in these townships were all granted riparian rights (i.e. access to the water and to boating

83. Wedged in between the Magaliesberg and the dam, the stand holders of Kosmos had direct access to the water, allowing them to build their own boat houses. It was a charming village that soon attracted a cluster of artists – painters, sculptors, actors and writers. In the 1930s, stands in Kosmos were selling for £200, compared with £60 in Schoemansville and £70 in Meerhof (Meyer, 2013).



Photograph by Paul Saad

and angling).⁸⁴ Immediately south-east of the dam was the farm, Pelindaba, owned by Gustav Preller, which was frequented by the literary and artistic elite of the Transvaal.⁸⁵

The riparian rights in these townships were staunchly defended by Schoeman and the stand holders. Johan Schoeman also took full advantage of his monopoly of commercial rights. He owned the Agnes Hotel, where weekenders stayed, as well as the Meerhof Café at the railway siding, where weekenders waited for transport to the hotel. He rented trains that transported his patrons around the dam and also controlled all commercialised boating (Meyer, 2013). Under the patronage of Schoeman, the dam became a popular weekend getaway. It also attracted its share of the rich and famous including the Prince of Wales, later King Edward VIII. In his article, Meyer (2013) includes a photograph of bathers enjoying “the pristine waters of the dam”.

Once the Vaal Dam was completed in 1937, there was direct competition to Hartbeespoort’s role as a recreational hub. There was also a question, for a whole decade, as to which of the two dams would become the aviation hub for the region. At the time, Imperial Airways, which dominated the long-distance route between London and Johannesburg, was using flying boats. Schoeman, however, insisted he had the

riparian rights and refused permission for landings. Imperial Airways established their short-lived flying boat base at Deneysville on the Vaal Dam instead (Meyer, 2013).

In the post-war era, Hartbeespoort remained a popular weekend getaway. It was a place for holiday and youth camps, with the fortunate few owning weekend cottages. There was also a growing cluster of artists living in the area. In 1954, for example, Alexis Preller, one of South Africa’s leading artists moved to the family farm near Hartbeespoort, and a number of other artists established studios in Kosmos. However, the property development which had characterised the earlier decades ended, with significant new residential development only resuming from the late 1960s. The focus of formal recreational development had shifted to the Vaal Dam (Meyer, 2013).

The secluded hills of the Magaliesberg around the dam did however provide the location for covert developments. In 1961 the National Aeronautics and Space Administration (NASA) of the United States of America, built its Deep Space Station 51 near Hartbeespoort.⁸⁶ Also in 1961, South Africa’s Atomic Energy Corporation (AEC), which had been established in 1948, moved its headquarters to the farm Pelindaba, which it bought from the Preller family. In 1965, Safari I, South Africa’s

84. Schoeman also developed the small township of Melodie, where riparian rights were not granted.

85. Preller was a leading literary figure in the Transvaal. His associates included J.H. Pierneef (who popularised Hartbeespoort in his art), Frans Oerder, Erick Mayer, Coert Steynberg and Eugene Marais (who committed suicide at Pelindaba in 1936) (Holm, 2005).

86. After its closure in 1974, it became a radio astronomy observatory run by the CSIR, and later by the National Research Foundation (NRF). It is currently known as the Hartbeeshoek Radio Astronomy Observatory (HartRAO) [www.hartrao.ac.za].

first atomic reactor, was opened at this site (GlobalSecurity.org, 2015).

Economic growth and environmental crisis from the late 1960s

Renewed property development in the late 1960s was partly prompted by the expanding nuclear programme, as the growth of the Pelindaba complex brought scientists and skilled personnel into the area.⁸⁷ Industrial development around Brits and at Rosslyn, as part of the government's industrial decentralisation programme, also brought managerial staff and white-collar workers into the area.

New residential development (for example, Kosmos Extension) led to improved facilities such as local schools and shops. A cluster of tourist attractions also emerged, supplementing the long-established boating and angling activities. These included the Snake and Animal Park in Schoemansville in the late 1960s; the Ann van Dyk Cheetah Centre (later De Wildt Cheetah Centre) opened in 1971; the first Harties Aerial Cableway, constructed in 1973,⁸⁸ and balloon safaris from 1981. The growth was also supported by the development of Sandton, a high-income residential complex north-west of Johannesburg, in relative proximity to Hartbeespoort, and Lanseria airport which opened in 1974. In 1970, the dam wall was raised by 2.44 m, increasing the dam's volume from 160 million m³ to 205 million m³. Hartbeespoort continued to attract artists. Norman Catherine moved to Hartbeespoort in 1973, and collaborated with Walter Battiss on the construction of his home, the "primitive-futuristic fantasia" known as Fook Manor.⁸⁹ Jeremy Taylor, satirical singer and actor, also lived in the area, and wove his experiences of Hartbeespoort into his lyrics.

However, while Hartbeespoort appeared to prosper, an environmental crisis unfolded. Massive amounts of industrial and sewage effluent were dumped into the Crocodile River and its tributaries, especially from the Jukskei River, with its headwaters in the inner city of Johannesburg. There was also contamination by the insecticides used in the agricultural sector, and additional fears of radioactive contamination from Pelindaba.⁹⁰ From the early 1960s, the dam had become increasing *eutrophic* (meaning nutrient enriched). There were cattle deaths along the shores of the dam in 1974, and blue-green algal blooms appeared, which affected the taste and odour of the water and posed growing health threats to humans (Jarvis, 1988; Department of Water Affairs, 2004).

Alien invasive water hyacinths got into the dam and by 1978, 80 per cent of the water surface was covered with this weed. Angling, boating and other water sports were brought to a near halt, and the area faced possible disaster in terms of any future development. Various methods were attempted to clear the dam, and eventually crop-sprayer aircraft were used to chemically poison the hyacinth. This was a controversial action, which had various negative consequences, as the decomposing hyacinth released its own nutrients into the water, which fed the blue-green algae. In 1985, the dam was classified as *hyper-eutrophic* (excessively nutrient enriched). In the mid-1980s, however, the Department of Water Affairs introduced effluent standards within the catchment of the dam, and this led to an approximate 20 per cent reduction in phosphorus loads, but with considerable variation across the seasons (Jarvis, 1988; Department of Water Affairs, 2004; Lake, 2011).⁹¹

87. A full-scale nuclear device (minus highly-enriched uranium) had been produced by 1977, and in 1982, South Africa's first operational nuclear bomb was produced. The programme was terminated by F.W. de Klerk in 1989, but the South African government only admitted the existence of the programme in 1993 (GlobalSecurity.org, 2015).

88. The cableway was closed in 2005 after it had fallen into disrepair, but in 2010 a Swiss company invested R50 million in its restoration [<http://www.hartiescableway.co.za/>].

89. See <http://www.normancatherine.co.za>.

90. Radioactive contamination was generally denied by officials but was monitored on an annual basis by the Atomic Energy Board (for example, Atomic Energy Board, 1976).

91. South Africa suffered a severe drought in the period 1982–1987, which saw the levels of the dam plummet from 100 per cent to 22 per cent, and greater concentrations of pollution. However, the drought ended with floods, and the dam refilled with significantly reduced pollution levels.



Photographs by Brian Boshoff (On the dam: Hartbeespoort)

“South Africa’s Riviera” in the 1990s and 2000s

The 1990s began with improved water quality, and better prospects overall for South Africa as a political solution for the country was in sight. The property market was depressed from the early 1980s until the mid-1990s, when, with stronger investor confidence in South Africa, a stronger currency, lower interest rates, and a growing middle-income sector, boom-time conditions returned (Clark and Daniel, 2009). For Hartbeespoort, key factors also included the growing market for second homes, as weekend or holiday getaways (Visser, 2004; Hoogendoorn et al., 2005; Visser and Hoogendoorn, 2015), and the steep rise of the timeshare industry in South Africa (Pandy and Rogerson, 2013).

The late 1990s and early 2000s were the heyday of growth at Hartbeespoort, with excited discussion at the time of the dam as “South Africa’s Riviera” (*Die Beeld*, 16 April 2003). Although there were small gated lifestyle estates such as Lakeside and Eagle’s

Landing in the early 1990s, the real game-changer was the development of the exclusive Pecanwood Estate between 1996 and 1999, one of the first of South Africa’s large inland golf estates. This estate, built around the signature Jack Nicklaus golf course, first brought the millionaires to Hartbeespoort.⁹²

With the development of Pecanwood, property prices along Hartbeespoort tripled within three years, and the waterfront became one of the most expensive areas of real estate in the country. Pecanwood was followed by a number of other exclusive lifestyle estates, although not at the same scale, for example, Caribbean Golf Club, Port d’Afrique, K’Shane Lake Lodge, The Coves, The Islands Estate, and Bay Golf Estate.⁹³ The developments were, however, not all for the very wealthy, with growth also providing for the middle class (for example, the Xanadu Eco Estate). Although the area remained predominantly a weekend getaway with second homes, there were trends towards permanent residence, especially in the 50+ age group.

92. See <http://pecanwoodhartbeespoort.co.za>.

93. While Hartbeespoort did attract the extremely wealthy, with some properties fetching around R40 million, there was also a fair spread of property prices with properties from around R450 000 (<http://www.chaseveritt.co.za/hartbeespoort?type=1>).

“The massive property and related development, drawn to the area because of its natural beauty and tranquillity, was invariably self-defeating.”

The residential development was accompanied by further development in tourist facilities and by growth in retail and other services. The Lesedi Cultural Village opened in 1993 followed by the Elephant Sanctuary in 1999, and the reopening of the cableway in 2010. There were three significant retail developments – Sediba Plaza (11 000 m²); Village Mall (24 000 m²); and Chameleon Village, which opened around 2005 as South Africa’s largest indoor market. These were linked to a cluster of new tourist attractions such as a niche brewery, a reptile park, and a lion park. There were also numerous restaurants, spas, new art galleries, and other upmarket services, supporting the lifestyle market around the dam. Pecanwood College opened as an elite private school.

Growing challenges in the area eventually stifled the growth trajectory, however. The massive property and related development, drawn to the area because of its natural beauty and tranquillity, was invariably self-defeating. By the 2000s, Hartbeespoort was no longer tranquil – the area was packed with human activity, and the roads to Johannesburg and Pretoria were congested, especially over weekends (Visser, 2004). This coincided, from 2008, with a general slump in the property market.

As Long and Hoogendoorn (2013) explain, the persistence of environmental problems contributed to a widely-perceived decline in the attractiveness of Hartbeespoort, and to the drop in property values.

Extensive blue-green algae blooms returned to the dam between 2000 and 2003 (Ross, 2010). This time, however, there was stronger local action, with residents forming the Hartbeespoort Water Action Group (HWAG).⁹⁴ The government tried to respond. Around 2004, the *Harties Metse A Me* initiative was launched by the national Department of Water Affairs to improve water quality, but it was widely criticised for its high cost and poor returns (*Engineering News*, 28 March 2008; Ross, 2010).⁹⁵ The real difficulty is that the environmental problems are largely a product of what happens beyond the locality. Effluent from inner city Johannesburg, for example, which makes its way into the dam via the Jukskei and Crocodile Rivers, can hardly be dealt with through an initiative local to Hartbeespoort. In 2015, there were renewed problems when the Madibeng local municipality blamed a water shortage in Brits and other parts of the municipality on algae blooms in the dam that were delaying the purification process (*Times Live*, 16 January 2015).

Contemporary concerns are not only environmental. Hartbeespoort has been criticised for being a white enclave that has failed to transition to the new South Africa. In 2011, the Hartbeespoort subplace was 59.4 per cent white, although a closer look shows an even more extreme picture.⁹⁶ Around the dam are sub-enclaves, many of which are overwhelmingly white: Schoemansville, Ifafi and Port d’Afrique are more than 80 per cent white,

94. The HWAG used a combination of tactics from laying criminal charges against government for criminal neglect after raw sewage was found pumping into the dam, to joint public-private environmental initiatives (Ross, 2010).

95. By 2013, however, there were reports of an improvement, mainly as a result of an innovative initiative to harvest algae by hand, which provided employment to between 80 and 140 workers (*IOL News*, 7 January 2013; *Engineering News*, 8 November 2013). In 2015, however, there were media reports of water shortages after a severe algae bloom interrupted the water purification process (*Times Live*, 16 January 2015).

96. The subplace includes a rural district to the north of the dam which is 95 per cent black African. Excluding this area, Hartbeespoort is overwhelmingly white within a city-region that is overwhelmingly black in its demography.

and Pecanwood, West Lake, Meerhof and the Coves are between 60 and 70 per cent. Only middle-range Xanadu Eco Estate is relatively balanced, racially, while Island Estate and Caribbean Beach are majority African, suggesting some inroads by the emerging African elite (StatsSA, 2011).

In 2000, Hartbeespoort was incorporated into the Madibeng local municipality, which includes Brits and a number of informal settlements, townships and mining compounds. The mainly white Hartbeespoort has a complex relationship within the Madibeng local municipality, which administers an area

that, overall, is 90 per cent African. The difficulties have been compounded by incidents of racism at Hartbeespoort,⁹⁷ disputes around land claims,⁹⁸ and the poor performance of the municipality.⁹⁹ In 2010, the Hartbeespoort Inhabitants Forum announced its intention to establish a Section 21 company to take over some of the functions of the municipality, with threats by white residents of a rates boycott (*Kormorant*, 3 February 2010; *Times Live*, 7 March 2010). In 2015, there were demands by Hartbeespoort residents for their own municipality (*Business Day*, 1 October 2015).



Photograph by Brian Boshoff (Gauteng's Riviera?)

97. An example is the blatantly advertised "all-white boat cruise", <http://www.wherevent.com/detail/De-Grandiose-House-All-white-Party-Cruise-in-Hartbeespoort-dam>, accessed 3 April 2015.

98. For example, a black community which had lodged a land claim was furious when the land was sold off to a luxury estate developer before the claim was addressed (*Mail & Guardian*, 9 July 2010).

99. A major issue is the maintenance of the water supply. In 2010, raw sewage was pumped into the dam after poorly-maintained municipal pumps stopped working (*Kormorant*, 3 February 2010; *Times Live*, 7 March 2010).

Conclusion

The Hartbeespoort story is presented above as an illustration of growth on the spatial edge of a city-region produced by the demand for recreational space. It is not a simple story, with many twists and turns over time, occasioned by both local factors and the changing context within which this local development happened. There are many insights or lessons that could be drawn from this tale, but arguably, the most pressing is around the relationship between environmental quality and the sustainability of

development processes. The troubles at Hartbeespoort are the consequence of many decades of environmental neglect, not only in the vicinity of the dam, but more importantly, over the wider catchment. There is now no easy solution, but the future of Hartbeespoort as a place of natural attraction does depend on a long-term, systematic, multi-faceted programme to improve water quality in the upper catchment of the Crocodile River, and also more rigorous management of development around the dam.



Photograph by Nick Roux

6. Conclusions

The diverse stories of development in the perimetropolitan belt of the GCR, challenge both the hyped-up literatures on edge city development, which posit the edge as the new focus of growth, and the simplistic applications of agglomeration theory, which suggest that the spatial periphery will invariably lose out to the spatial core. Change processes are clearly variant and complex across both space and time, responding to many contextual factors at different scales, and to multiple local contingencies.

However, although there is complexity, and also specificity of each case, there are broad trends, and insights that may be carried across contexts, even beyond national borders. A general insight, for example, is how important it is to have an understanding of *history* or *temporality*. In all the cases we studied, current developments are layered on earlier developments, and their trajectories and prospects are significantly shaped by what happened before. Issues of *timing* are also important. The success in one locality and failure in another may often be explained by the temporal context within which the initiative happened.

The various sites along the (constantly moving) edge of the GCR add to a gradually expanding international picture of what is happening along the edges of city-regions. The GCR edge may not offer much information on private-sector-led edge city development¹⁰⁰ but it does offer other insight for local and global study which arguably includes:

- The development trajectories of regions and localities with mining as the initial growth trigger;
- The shaping power of the state in providing public infrastructure (but with a strong influence from other actors);
- The impacts of direct state investment (and disinvestment) in industrial activity;
- The extended impacts of state programmes to incentivise dispersal of industry from the core to the

edge of the city-region;

- The significance of institutions and governance arrangements in the shaping of space;
- The shift towards the wholesale and retail sectors as a driver of growth;
- The sustainability implications of both economic growth and decline.

The GCR may be unique, globally, in the scale of mining-related activity, historically, but it is only one of many instances where mining has influenced the development of an urban agglomeration. The key question for many mining-based settlements, globally, is what their prospects are for diversifying economies to survive the boom-bust cycle associated with extractive economies. The experience of Johannesburg in the metropolitan core makes a powerful point in this regard, but there are also important lessons from the spatial edge. The contrasting cases of Carletonville and Nigel-Heidelberg in the GCR reveal both the extreme difficulties and the possibilities for economic diversification. There are many contingencies in both cases, and it is impossible to transfer lessons from these contexts to others too tightly, but there are suggestive implications. Most important, perhaps, is the need to invest in diversification when mining is still flourishing. In Nigel, for example, early industrialisation proved critical in sustaining the local economy when mining inevitably declined.

The second insight relates to the shaping power of the state in providing base infrastructure that directs patterns of development. The state's role in providing water, power and transport (road and rail) was immensely important in providing the spatial backbone that shaped development patterns, and, to a large degree, development trajectories still follow the broad patterns that were established more than a century ago. However, the role of the state in providing infrastructure cannot be separated from interactions with private actors. The early patterns of infrastructure investment were not the product

100. The edge cities in Gauteng that correspond most closely to the Garreau ideal are more closely tied, spatially, to the metropolitan core. In the 1970s, Sandton City may appropriately have been considered as an edge city. Today, developments in Midrand, Waterfall, Modderfontein, and Centurion may be usefully viewed through an edge city lens. In relation to large-scale private-sector-led growth, perimetropolitan GCR is a banal space.

“... post-apartheid border changes that brought localities into Gauteng Province, and into metropolitan municipalities, have played a role in the restoration of local growth processes.”

of rational planning by the state on the proverbial blank slate, but rather the consequence of complex relational engagements. In the Vaal Triangle, for example, the private entrepreneur, Sammy Marks, played an astonishing role in shaping state investment in the Vaal Triangle, through a network of patrimonial linkages with the state, and there are other also examples, such as the role of local landowners in the development of Hartbeespoort Dam and environs.

The third set of insights relates to the role of the state in setting up industry, and to the effects on localities when the state disinvests. The locational imperatives of state and privately-owned industry differ, with the state being more amenable, for example, to locating industry on geographical peripheries. This was the case of the Vaal Triangle, where strategic imperatives (for example, war-time steel production, and self-sufficiency in petroleum products) intermingled with strategic spatial objectives such as regional balance. However, once again, there was a blurred relationship between the rationales and activity of government and the private sector. Location of industry in the Vaal clearly did have an economic rationale (in the supply of water and power for steel-making, and access to transport networks). But, locational decision-making by the state was also manipulated by the interests of private entrepreneurs such as Sammy Marks.

The more important current question for the GCR, and for many localities globally, is what happens to localities created through direct state investment when the state disinvests. State-owned industry may have been inefficient, but it was often relatively stable, buttressed by various forms of strategic support. Localities often grow rapidly when state-owned industries are established, and then experience decades of relative insecurity when the state disinvests.

Fourth, the GCR offers insights into the possible

futures of places in South Africa, and internationally, that were created through industrial dispersal and growth pole policies. The studies of Babelegi and Bronkhorstspuit show that the impacts of state policy (including industrial incentives) should be explored over an extended period. While Babelegi and Bronkhorstspuit suffered degrees of decline after the removal of industrial incentives, the industrial infrastructure established in an earlier period arguably now provides the base for new economic activity. There are also surprise outcomes of earlier initiatives such as the ‘faith-based economy’ of Bronkhorstspuit that followed Taiwanese investment in the 1980s.

The fifth area of insight is around the role of governance and institutions in supporting spatial development. There are strong indications, for example, that post-apartheid border changes that brought localities into Gauteng Province, and into metropolitan municipalities, have played a role in the restoration of local growth processes.

The sixth area relates to the rise of wholesale and retail trade as a driver of growth. Conventionally, this sector is regarded as one of *derived* growth, that tracks the development of more basic sectors such as mining or manufacturing. Our case studies suggest, however, that wholesale and retail may be drivers of growth in their own right. New malls are being established, for example, in areas where other sectors are highly vulnerable, or even, in real decline. This development often stimulates the growth of the construction and property sectors, and leads residents to spend more locally, increasing the local circulation of income. This is consistent, for example, with arguments around the rise of consumer spending power in the townships, and the capacity of new malls to tap into this expansion (McGaffin and Gavera, 2011). On the downside, however, new malls may negatively affect small- to medium-sized independent

business in the formal and informal sectors, and could impact on CBDs already facing varying degrees of decline.

A seventh set of insights relates to the role of environmental quality in ensuring the sustainability of growth on the spatial edge. There is acknowledgement in the international literature that locations on the edge are often disproportionately vulnerable to environmental deterioration, as management processes are frequently weaker in these localities than in the spatial core. There may indeed be short- to medium-term economic benefits in having weak or overly flexible environmental controls, but the lesson

from the edge of the GCR is that the long-term effects could be severely damaging. Places like Carletonville-Khutsong, Steel Valley in the Vaal, and Hartbeespoort Dam provide sobering lessons.

Finally, a key conclusion from this report is that the experience of history should talk to the present, including to policies and plans for the future. Drawing the lessons is not always simple, but it is necessary. The report shows, for example, that government interventions in the metropolitan periphery may have large-scale impacts, but these impacts are often not what is planned or anticipated.



Photograph by Clive Hassall

Bibliography

- ABRAHAMS, D. (2007). The Military as an Economic Agent in Local Economic Development: The Case of South Africa, *Urban Forum*, 18: 13-30.
- ADDIE, J. AND KEIL, R. (2015). Real Existing Regionalism: The Region between Talk, Territory and Technology, *International Journal of Urban and Regional Research*, 39(2): 407-417.
- ADELL, G. (1999). *Theories and Models of the Peri-urban Interface: A Changing Conceptual Landscape, a Report of the Development Planning Unit*, University College, London. Available at http://discovery.ucl.ac.uk/43/1/DPU_PUI_Adell_THEORIES_MODELS.pdf.
- AFRICAN DEVELOPMENT ECONOMIC CONSULTANTS (PTY) LTD AND KAY, K. (2009). *Industrial Land Study for the City of Johannesburg, Department of Development Planning and Urban Management*, Directorate of Development Facilitation: 1 & 2. Johannesburg: City of Johannesburg, Department of Development Planning and Urban Management.
- AGUILAR, A. (1999). Mexico City Growth and Regional Dispersal: The Expansion of Largest Cities and New Spatial Forms, *Habitat International*, 23(3): 391-412.
- AGUILAR, A. (2008). Peri-urbanization, Illegal settlements and Environmental Impact in Mexico City, *Cities*, 25: 133-145.
- AGUILAR, A. AND WARD, P. (2003). Globalization, Regional Development, and Mega-city Expansion in Latin America: Analyzing Mexico City's Peri-urban Hinterland, *Cities*, 20(1): 3-21.
- AHUJA, G. AND MAJUMDAR, S. (1998). An Assessment of the Performance of Indian State-owned Enterprises, *Journal of Productivity Analysis*, 9(2): 113-132.
- ALEXANDER, A. (2009). *Britain's New Towns. Garden Cities to Sustainable Communities*. Routledge: London.
- AMIN, S. (1976). *Unequal Development: An Essay on the Social Formations of Peripheral Capitalism*. New York: Monthly Review Press.
- ANDERSON, A. (2000). Paradox in the Periphery: An Entrepreneurial Reconstruction? *Entrepreneurship and Regional Development: An International Journal*, 12(2): 99-109.
- ANDERSSON, M. AND KARLSSON, C. (2007). Knowledge in Regional Economic Growth – The Role of Knowledge Accessibility, *Industry and Innovation*, 14(2): 129-149.
- ANONYMOUS 1. (2013). Interview conducted with community leader in Khutsong by Yasmeen Dinath and Khangelani Moyo, 13 March.
- ANONYMOUS 2. (2013). Interview conducted with community leader in Khutsong by Yasmeen Dinath and Khangelani Moyo, 13 March.
- ARCELORMITTAL. (2012). *ArcelorMittal South Africa Vanderbijlpark Works*. Presentation. Available at <http://southafrica.arcelormittal.com/Portals/0/Vanderbijlpark%20Works%20presentation%20%E2%80%93%20UBS%20visit%20%203%20Oct%202012.pdf>.
- ATOMIC ENERGY BOARD. (1976). *Environmental Radioactivity at the National Nuclear Research Centre, Pelindaba*. Available at http://www.iaea.org/inis/collection/NCLCollectionStore/_Public/08/303/8303307.pdf.
- BANISTER, D. AND BERECHMAN, Y. (2001). Transport Investment and the Promotion of Economic Growth, *Journal of Transport Geography*, 9(3): 209-218.

- BARCHIESI, F. AND KENNY, B. (2002). From Workshop to Wasteland: De-industrialisation and Fragmentation of the Black Working Class on the East Rand (South Africa) 1990–1999, *International Review of Social History*, 47: 35–63.
- BEAUREGARD, R. (1995). Edge Cities: Peripheralizing the Center, *Urban Geography*, 16(8): 708–721.
- BEAUREGARD, R. (1997). The Unavoidable Incompleteness of the City, *American Behavioral Scientist*, 41: 327–341.
- BELL, T. (1984). *The State, the Market, and the Interregional Distribution of Industry in South Africa: Report for the Second Carnegie Inquiry into Poverty in South Africa*, Carnegie Conference paper No. 243. Available at http://www.opensaldru.uct.ac.za/bitstream/handle/11090/196/1984_bell_ccp243.pdf?sequence=1, accessed 29 June 2015.
- BEUKMAN, E. (2012). *Presentation: Turnaround Strategy and Revitalisation of the Babelegi Industrial Park*. TITIIC 2012 edn. CSIR Enterprise Creation for Development, Pretoria.
- BIGALE, L. (2011). Consol Nigel Glass Factory, South Africa, *Engineering News*, November 25.
- BINNS, T. AND NEL, E. (2003). The Village in the Game Park: Community Response to the Demise of Coal Mining in KwaZulu-Natal, *South Africa Economic Geography*, 79: 421–66.
- BLIGNAUT, J. (2012). Climate Change: The Opportunity Cost of the Kusile and Medupi Power Stations, *Journal of Energy in Southern Africa*, 23(4): 67–75.
- BLOCH, R. (1993). Regenerating the East Rand: Promoting Growth and Opportunity in the South African Industrial Heartland, Unpublished report for the Urban Foundation, Office for Metropolitan and Industrial Research, Germiston.
- BLOOM, J. (2011). Stinkwater: A Forgotten Community, *Politicsweb*, September 27. Available at <http://www.politicsweb.co.za>.
- BONNER, P. (1990). Desirable or Undesirable Basutho Women? Liquor, Prostitution and the Migration of Basutho Women to the Rand, 1920–1945, in C. Walker (ed.), *Women and Gender in Southern Africa to 1945*, Cape Town: David Philip Publishers, pp. 238–240.
- BONTJE, M. (2004). From Suburbia to Post-suburbia in the Netherlands: Potentials and Threats for Sustainable Regional Development, *Journal of Housing and the Built Environment*, 19(1): 25–47.
- BONTJE, M. AND BURDOCK, J. (2005). Edge Cities, European-style: Examples from Paris and the Randstad, *Cities*, 22(4): 317–330.
- BOOYSENS, I. AND VISSER, G. (2010). Tourism SMME Development on the Urban Fringe: The Case of Parys, South Africa, *Urban Forum*, 21(4): 367–385.
- BRAUN, T. (2012). *Puma*. Neurstadt: Books on Demand GmbH.
- BROOKS, S. (2005). Images of ‘Wild Africa’: Nature Tourism and the (Re)creation of Hluhluwe Game Reserve, 1930–1945, *Journal of Historical Geography*, 31(2): 220–240.
- BRYCESON, D. AND MACKINNON, D. (2012). Eureka and Beyond: Mining’s Impact on African Urbanisation, *Journal of Contemporary African Studies*, 30(4): 539–550.
- BUIRE, C. (2014). Suburbanisms in Africa? Spatial Growth and Social Transformation in New Urban Peripheries: Introduction to the Cluster, *African Studies*, 73(2): 241–244.
- BUNN, D. (1996). Comparative Barbarism: Game Reserves, Sugar Plantations, and the Modernization of South African Landscape, in K. Darian-Smith, L. Gunner and S. Nuttall (eds), *Text, Theory, Space: Land, Literature and History in South Africa and Australia*. London: Routledge, pp. 37–52.
- BURNLEY, I. AND MURPHY, P. (1995). Residential Location Choice in Sydney’s Perimetropolitan Region, *Urban Geography*, 16(2): 123–143.

- BURNLEY, I. AND MURPHY, P. (2005). *Sea Change: Movement from Metropolitan to Arcadian Australia*. Sydney: University of New South Wales Press.
- CAPASSO, M., CEFIS, E. AND FRENKEN, K. (2011). Spatial Differentiation in Industrial Dynamics: A Core–Periphery Analysis Based on the Pavitt-Miozzo-Soete Taxonomy. Internal Report, Ecis Working Paper, No. 11.01. Eindhoven: Technische Universiteit Eindhoven.
- CASTELLS, M. AND HALL, P. (1995). *Technopoles of the World: The Making of Twenty-first Century Industrial Complexes*. London: Routledge.
- CDE. (1997). *The East Rand: Can South Africa's Workshop be Revived?* Report of the Centre for Development and Enterprise in the Big Cities Series. Available at <http://www.cde.org.za/>.
- CERVERO, R. (1995). Planned Communities, Self-containment and Community: A Cross-National Perspective, *Urban Studies*, 32(7), 1135-1161.
- CHASKALSON, M. (1986). *The Road to Sharpeville*, African Studies Seminar Paper, No. 199. Available at <http://wiredspace.wits.ac.za/bitstream/handle/10539/8519/ISS-75.pdf?sequence=1>.
- CHAUKE, C. (2011). *Tshwane Strategic Investment Attraction, Facilitation and Aftercare Plan (2011–2016)*. Department of Economic Development, City of Tshwane.
- CITY OF EKURHULENI. (2011). *Ekurhuleni Metropolitan Spatial Development Framework Review 2010/11: 1,2,3*. City of Ekurhuleni Metropolitan Municipality, Ekurhuleni.
- CITY OF MERAUFONG. (2015). *A Large Sinkhole has Developed in Carletonville*. Available at <http://www.meraufong.gov.za/2015/06/15/4181/>.
- CITY OF TSHWANE. (2008). *Draft Spatial Development Framework for the Far North Eastern Region of the City of Tshwane*. City of Tshwane.
- CITY OF TSHWANE. (2010). Service Delivery and Budget Implementation Plan July 2010 to June 2011. Available at http://www.tshwane.gov.za/sites/Departments/Financial-Services/SDBIP/SDBIP2010_11.pdf.
- CITY OF TSHWANE. (2012a). *Tshwane Metropolitan Spatial Development Framework*, June 2012. City of Tshwane.
- CITY OF TSHWANE (2012b). *Tshwane Regional Spatial Development Framework Region 7*. City of Tshwane.
- CLARK, A. AND DANIEL, T. (2009). Forecasting South African House Prices, *Investment Analysts Journal*, 64: 27-34.
- CLOKE, P., CRANG, C. AND GOODWIN, M. (2013). *Introducing Human Geographies*, Second Edition. Abington: Routledge.
- COHEN, P. (2010). Lessons from the Nationalization Nation: State-Owned Enterprises in France, *Dissent*, Winter 2010. Available at <http://www.dissentmagazine.org/article/lessons-from-the-nationalization-nation-state-owned-enterprises-in-france>.
- COMAROFF, J. AND COMAROFF, J. (eds). (2006). *Law and Disorder in the Postcolony*. Chicago: University of Chicago Press.
- CONSOL GLASS. (2013). *Consol Nigel*. Available at http://Hammanskraal.consol.co.za/irj/go/km/docs/site/pages/consol_nigel.html, accessed 13 June 2013.
- COPUS, A. (2001). From Core–Periphery to Polycentric Development: Concepts of Spatial and Aspatial Peripherality, *European Planning Studies*, 9(4): 539-552.
- CRANKSHAW, O. (1996). Social Differentiation, Conflict and Development in a South African Township, *Urban Forum*, 7(1): 53-67.

- CREAMER, M. (2008). *Gold Fields Ready to Pass on Rose-growing Baton as R50m Expansion Unfolds* [Homepage of Mining Weekly], 11 July. Available at <http://Hammanskraal.miningweekly.com/article/gold-fields-ready-to-pass-on-rose-growing-baton-as-r50m-expansion-unfolds-2008-07-11>, accessed 20 June 2013.
- CURLE, J. (1905). *Gold Mines of the World*. London: Routledge.
- DAVOUDI, S. (2003). Polycentricity in European Spatial Planning: From an Analytical to a Normative Agenda, *European Planning Studies*, 11(8): 979-999.
- DE BRUYN, C. (2010). *Gauteng seeks private sector funding for infrastructure projects* [Homepage of Engineering News], 22 February. Available at <http://Hammanskraal.engineeringnews.co.za/article/gauteng-seeks-private-sector-funding-for-infrastructure-projects-2010-02-22>, accessed 16 June 2013.
- DE JAGER, C. AND BOSOGA, D. (2011). *Merafong Regional Spatial Development Framework 2011*. Merafong City.
- DEPARTMENT OF WATER AFFAIRS. (2004). *Hartbeespoort Dam Remediation Project*. Available at <https://www.dwa.gov.za/Harties/documents/ActionPlanVol1Oct04p2.pdf>, accessed 1 April 2015.
- DEWAR, D., TODES, A. AND WATSON, V. (1986). Industrial Decentralization Policy in South Africa: Rhetoric and Practice, *Urban Studies*, 23(5): 363-376.
- DOAN, P. AND ODURO, C. (2012). Patterns of Population Growth in Peri-urban Accra, Ghana, *International Journal of Urban and Regional Research*, 36(6): 1306-1325.
- DOUGLASS, M. AND HUANG, L. (2012). Globalizing the City in Southeast Asia: Utopia on the Urban Edge – The Case of Phu My Hung, Saigon, *IJAPS*, 3(2): 1-42.
- DÖVÉNYI, Z. AND KOVÁCS, Z. (2006). Budapest: The Post-Socialist Metropolitan Periphery Between 'Catching up' and Individual Development Path, *European Spatial Research and Policy*, 13(2): 23-40.
- DUNN, J. (2006). *Comeng 1: A History of Commonwealth Engineering 1921-1955*. Kenthurst: Rosenberg Publishing.
- DURANTON, G. AND PUGA, D. (2001). Nursery Cities: Urban Diversity, Process Innovation, and the Life Cycle of Products, *American Economic Review*, 91(5): 517-525.
- EARTHLIFE AFRICA (2009) Press release. *Climate Protest at Sasolburg Plant*, 8 December. Available at <http://earthlife.org.za/2009/12/press-release-climate-protest-at-sasolburg-plant/>.
- EKERS, M., HAMEL, P. AND KEIL, R. (2012). Governing Suburbia: Modalities and Mechanisms of Suburban Governance, *Regional Studies*, 46(3): 405-422.
- EKURHULENI METROPOLITAN MUNICIPALITY. (2005). *Ekurhuleni Growth and Development Strategy 2025*. Germiston: City of Ekurhuleni Metropolitan Municipality, Directorate of Communications and Marketing.
- EKURHULENI METROPOLITAN MUNICIPALITY. (2010a). *Development Guide*. Germiston: City of Ekurhuleni Metropolitan Municipality, Directorate of Communications and Marketing.
- EKURHULENI METROPOLITAN MUNICIPALITY. (2010b). *A Ten Year History of Ekurhuleni 2000-2010*. Germiston: City of Ekurhuleni Metropolitan Municipality, Directorate of Communications and Marketing.
- EMFULENI LOCAL MUNICIPALITY. (2011a). *Premier Nomvula Mokonyane Launches Maize Triangle*. [Homepage of Emfuleni Local Municipality]. Available at http://Hammanskraal.emfuleni.gov.za/index.php?option=com_content&view=article&id=201:premier-nomvula-mokonyane-launches-maize-triangle-&catid=1:emfuleni-news&Itemid=2, accessed 13 June 2013.
- EMFULENI LOCAL MUNICIPALITY. (2011b). *Emfuleni Local Municipality Integrated Development Plan 2011-2012*. Emfuleni Local Municipality.

- ERASMUS, H. (2010). Midvaal R59 Corridor: Vaal Flow, *Building Africa*, May. Available at: http://www.myvirtualpaper.com/doc/brookepatrick/ba_may_2010/2010050601/27.html#26, accessed 30 March 2015.
- ESKORT. (N/D). *Our history*. Available on <http://www.eskort.com/index.cfm?Aid=1885891806>.
- ESKOM. (N/D) *Kusile Power Station Project*. Available on http://www.eskom.co.za/Whatweredoing/NewBuild/Pages/Kusile_Power_Station.aspx.
- FEAGIN, J. 1990. Extractive Regions in Developed Countries: A Comparative Analysis of the Oil Capitals, Houston and Aberdeen, *Urban Affairs Review*, 25(4): 591-619.
- FGX STUDIOS. (2013). *Mall Listings: Tsakane Mall* [Homepage of FGX Studios]. Available at <http://Hamanskraal.mallguide.co.za/malls/gauteng/tsakane/tsakane-mall/1204>, accessed 13 June 2013.
- FIRMAN, T. (2009). The Continuity and Change in Mega-urbanization in Indonesia: A Survey of the Jakarta-Bandung Region (JBR) Development, *Habitat International*, 33: 327-339.
- FISHMAN, R. (1987). Bourgeois Utopias: Visions of Utopia, in *Bourgeois Utopias: The Rise and Fall of Suburbia*, 3-17. New York: Basic Books.
- FLOUD, R. AND MCCLOSKEY, D. (1994) *The Economic History of Britain Since 1700, Vol. 3*. Cambridge: Cambridge University Press.
- FOURIE, M. (2014). GroundUp: Vaal Environmental Justice Alliance Claims Court Victory, *Daily Maverick*, December 24.
- FREUDENBURG, W. AND FRICKEL, S. (1994). Digging Deeper: Mining-dependent Regions in Historical Perspective, *Rural Sociology*, 59(2): 266-288.
- FREUND, B. (2015). Twentieth-century Social and Environmental Planning in the Vaal Triangle and its Consequences. Paper presented at a Colloquium on the Peripheries of the Gauteng City-Region, School of Architecture and Planning, University of the Witwatersrand, Johannesburg.
- FREY, W. AND SPEARE, A. (1988). *Regional and Metropolitan Growth and Decline in the United States*. New York: Russel Sage Publications.
- FRIEDMANN, J. AND MILLER, J. (1965). The Urban Field, *Journal of the American Institute of Planners*, 31(4): 312-320.
- FUJITA, M. AND THISSE, J. (2013). *Economics of Agglomeration: Cities, Industrial Location and Globalization* (Second Edition). New York: Cambridge University Press.
- GABORIT, P. (2010). *European New Towns: Image, Identities, and Future Perspectives*, P.I.E. Brussels: Peter Lang.
- GANLEY, H. AND MILLS, G. (2011). *From 'Whoosh-Bonk' to Formula One Systems and Specialists: A Modern Recipe for High Tech Engineering Success*, Discussion paper 2011/02, The Brentthurst Foundation, Johannesburg.
- GARREAU, J. (1991). *Edge City: Life on the New Frontier*. New York: Anchor Books.
- GAUTENG PROVINCIAL GOVERNMENT, DEPARTMENT OF FINANCE. (2010). *Provincial Economic Review and Outlook 2010*. PR307/2010. Johannesburg: Gauteng Provincial Government.
- GEREFFI, G., HUMPHREY, J. AND STURGEON, T. (2005). The Governance of Global Value Chains, *Review of International Political Economy*, 12(1): 78-104.



Photograph by Clive Hassall

- GEYER, H. (1989). Apartheid in South Africa and Industrial Deconcentration in the PWV Area, *Planning Perspectives*, 4(3): 251-269.
- GEYER, H. (1996). Expanding the Theoretical Foundation of Differential Urbanization, *Tijdschrift voor Economische en sociale geografie*, 87(1): 44-58.
- GEYER, H. (JR), GEYER, H., DU PLESSIS, D. AND VAN EEDEN, A. (2012). Differential Urbanization Trends in South Africa: Local and Regional Equivalents, *Environment and Planning A*, 44: 2940-2956.
- GILBERT, L, AND DE JONG, F. (2015). Entanglements of Periphery and Informality in Mexico City, *International Journal of Urban and Regional Research*, 39(3): 518-532.
- GLOBALSECURITY.ORG (2015). *Pelindaba Nuclear Research Center 25°48'S 27°54'E*. Available at <http://www.globalsecurity.org/wmd/world/rsa/pelindaba.htm>, accessed 2 April 2015.
- GOLDFIELDS. (2012). *Integrated Annual Review*. Available at <https://www.goldfields.co.za/reports/2012/ir.pdf>.
- GOTZ, G., WRAY, C. AND MUBIWA, B. (2014). The 'Thin Oil of Urbanization'? Spatial Change in Johannesburg and the Gauteng City-Region, in P. Harrison, G. Gotz, A. Todes and C. Wray (eds), *Changing Space, Changing City: Johannesburg after Apartheid*. Wits University Press: Johannesburg: 42-62.
- GROUNDWORK. (2003). *National Report on Community-based Air Pollution Monitoring in South Africa: Air Pollution in Selected Industrial Areas in South Africa, 2000-2002*. Available at <http://www.groundwork.org.za/specialreports/AirMonitoringReport2003.pdf>.
- HALL, S. (2014). Industrial Closure, Regional Development and Local Planning: Multiple Narratives of Change from the Experience of Longbridge, Birmingham, *Local Economy*. doi: 10.1177/0269094213483968.
- HALLOWES, D. AND MUNNIK, V. (2006). *Poisoned Spaces: Manufacturing Wealth, Producing Poverty*, Groundwork Report. Available at <http://www.groundwork.org.za/reports/gWReport2006.pdf>.
- HAMEL, P. AND KEIL, R. (2015). Introduction: Governance in a Suburban World, in P. Hamel and R. Keil (eds.), *Suburban Governance: A Global View*. Toronto: University of Toronto Press.
- HARRISON, P. (1998). *Regional Policy: South African Challenges and Global Networks*. Report prepared for the Centre for Development and Enterprise, Johannesburg.
- HARRISON, P. AND TODES, A. (2016). Satellite Settlement on the Spatial Periphery – Lessons from International and Gauteng Experience. Paper presented at the Southern African Cities Conference held at the Durban University of Technology, Durban, 13-17 March.
- HARRISON, P. AND ZACK, T. (2012). The Power of Mining: The Fall of Gold and Rise of Johannesburg. *Journal of Contemporary African Studies*, 30(4): 551-570.
- HART, G. (2002). *Disabling Globalization: Places of Power in Post-apartheid South Africa*. Berkeley: University of California Press.
- HART, G. AND PARTRIDGE, T. (1966). Factors in the Development of the Urban Fringe North-West of Johannesburg, *South African Geographic Journal*, 48(1): 32-44.
- HART, J. (1991). The Perimetropolitan Bow Wave, *Geographical Review*, 81(1), 35-51.
- HARVEST BAGS (2013). Company Website. Available at <http://www.harvestbags.co.za/wcontact.php>, accessed 20 April 2015.
- HAYS, S. (1998). *Explorations in Environmental History: Essays*. Pittsburgh: University of Pittsburgh Press.

- HEIDELBURG GP. (2014). *Small Town with 'Big City' Benefits*. Available at <http://www.heidelberggp.co.za/>.
- HENDERSON, R. (1974). Industrial Overspill from Glasgow: 1958–1968, *Urban Studies*, 11(1): 61-79.
- HOLLOWAY, J. AND HONES, S. (2007). Muji, Materiality, and Mundane Geographies, *Environment and Planning A*, 39: 555-569.
- HOLM, A. (2005). *HOEV se opname van besien-swaardighede Hartbeespoortdam: Omgewings- en Erfenisvereniging van Hartbeespoortdam*. Available at <http://www.bobbejaanskloof.co.za/xcustom.php?page=16619>, accessed 2 April 2015.
- HOOGENDOORN, G., MELLETT, R. AND VISSER, G. (2005). Second Homes Tourism in Africa: Reflections on the South African Experience, *Urban Forum*, 16(2-3): 112-154.
- ISARD, W. (1956). *Location and Space-economy: A General Theory Relating to Industrial Location, Market Areas, Land use, Trade, and Urban Structure*. Boston: The Technology Press of MIT.
- ISPAT ISCOR. (2004). Investor Pack. Available at www.arcelormittals.com/Portals/0/investor_pack_aug_04ab5.ppt.
- IYER, S., KITSON, M. AND TOH, B. (2005). Social Capital, Economic Growth and Regional Development, *Regional Studies*, 39(8): 1015-1040.
- JAFFEE, G. (1988). Commuter Labour: Changing Women's Lives, Changing Households, *Agenda: Empowering Women for Gender Equity*, 3:3-9.
- JARVIS, A. (1988). Ecological Problems in the Hartbeespoort Dam, *Journal of the Limnological Society of Southern Africa*, 14(2): 82-86.
- JENKINS, P. (2003). In Search of the Urban–Rural Front-line in Post-war Mozambique and Angola, *Environment & Urbanisation*, 15(1): 121-134.
- JENKINS, P. (2013). *Urbanization, Urbanism and Urbanity in an African City: Home Spaces and House Cultures*. London: Palgrave Macmillan.
- JOHANNESBURG CITY COUNCIL. (1956). *Seventy Golden Years*. Johannesburg: Felspar Publishing Company.
- KARAN BEEF. (2013). *The Group* [Homepage of Karan Beef]. Available at <http://karanbeef.co.za/AboutUs>, accessed 13 June 2013.
- KASARDA, J. AND LINDSAY, G. (2011). *Aerotropolis: The Way We'll Live Next*. New York: Farrar, Strauss and Girrar.
- KESTING, M. AND WESTCOTT, A. (eds). (2009). *Sun Tropes: Sun City and (Post) Apartheid Culture in South Africa*. Koln: Verlag der Buchhandlung Walther Konig.
- KHARE INC. (2005). *Duduza Local Spatial Development Framework 2005*. Germiston: Ekurhuleni Metropolitan Municipality.
- KIRSHNER, J. (2014). Reconceptualising Xenophobia, Urban Governance and Inclusion: The Case of Khutsong, in C. Haferburg and M. Huchzermeyer (eds), *Urban Governance in Post-Apartheid Cities: Modes of Engagement in South Africa's Metropolises*. Stuttgart: Borntraeger Science Publishers.
- KIRSHNER, J. AND POKELA, C. (2010). *Khutsong and Xenophobic Violence: Exploring the Case of the Dog that Didn't Bite*. Centre for Sociological Research: University of Johannesburg. Available at http://www.gcro.ac.za/sites/default/files/News_items/Xeno_reports_July2010/case_studies/5_Khutsong_reprint_lowres.pdf.
- KITCO METALS INC. (2013). *Charts and Data* [Homepage of Kitco Metals Inc.]. Available at http://www.kitco.com/scripts/hist_charts/yearly_graphs.plx, accessed 6 October 2013.

- KOK, P. (1998). *South Africa's Magnifying Glass: A Profile of Gauteng*. Report. Cape Town: Human Sciences Research Council (HSRC).
- KRUGMAN, P. (1991). Increasing Returns and Economic Geography, *Journal of Political Economy*, 99(3): 483-499.
- KRUGMAN, P. (1995). *Development, Geography, and Economic Theory*. Cambridge MA: MIT Press.
- KRUGMAN, P. and VENABLES, A.J. (1996). Integration, Specialization, and Adjustment, *European Economic Review*, 40(3-5): 959-967.
- KUHN, A. (2012). Gauteng Agriculture Services: SA's Most Populous Region, *Match Deck*, <http://www.matchdeck.com/article/684-gauteng-agriculture-services-sa-s-most-populous-region#/index>.
- LAKE, S. (2011). *Drought and Aquatic Ecosystems: Effects and Responses*. New Jersey: Wiley-Blackwell.
- LALL, S. AND CHAKRAVORTY, S. (2005). Industrial Location and Spatial Inequality: Theory and Evidence from India, *Review of Development Economics*, 9(1): 47-68.
- LANG, R. (2003). *Edgeless Cities: Exploring the Elusive Metropolis*. Washington D.C.: The Brookings Institution.
- LANG, R. AND LEFURGY, J. (2003). Edgeless Cities: Examining the Noncentered Metropolis, *Housing Policy Debate*, 14(3): 427-460.
- LEIGH, R. (1968). *Vereeniging History*. Available at <http://www.vaaltriangleinfo.co.za/history/vereeniging/>.
- LESEDI LOCAL MUNICIPALITY. (2008). *Annual Report 2007-2008. GT423*. Heidelberg: Lesedi Local Municipality.
- LESEDI LOCAL MUNICIPALITY. (2011). *Annual Report July 2010 to June 2011: Development and Planning*. Draft Annual Report edn. Heidelberg: Lesedi Local Municipality.
- LESEDI LOCAL MUNICIPALITY. (2012). *Lesedi Local Municipality IDP 2012-2016*. Heidelberg: Lesedi Local Municipality.
- LEVITT, T. (1965). Exploit the Product Life Cycle, *Harvard Business Review*, 43:81-94.
- LI, H., CHANG, P., AND CHENG, Y. (2009). Economic Vulnerability of Mining City: A Case Study of Fuxin City, Liaoning Province, China, *Chinese Geographical Science*, 19(3): 211-218.
- LI, H., LO, K., AND WANG, M. (2015). Economic Transformation of Mining Cities in Transition Economies: Lessons from Daqing, Northeast China, *International Development Planning Review*, 37(3): 311-328.
- LIN, C. (2001). Metropolitan Development in a Transitional Socialist Economy: Spatial Restructuring in the Pearl River Delta, China, *Urban Studies*, 38(3): 383-406.
- LIN, C. (2004). The Chinese Globalizing Cities: National Centers of Globalization and Urban Transformation, *Progress in Planning*, 61(3): 143-157.
- LOCHNER, L. (2013). Resources Policy and Mine Closure in South Africa: The Case of the Free State Goldfields, *Resources Policy*, 38(3): 363-372.
- LOCHNER, L. AND CLOETE, J. (2013). Labour Migration, Settlement and Mine Closure in South Africa, *Geography*, 98: 77-84.
- LONG, D. AND HOOGENDOORN, G. (2013). Second Home Owners' Perceptions of a Polluted Environment: The case of Hartbeespoort, *South African Geographical Journal*, 95(1): 91-104.

- LORKIN, J. (2015). From Boom to Bust in Australia's Mining Towns, *BBC News*, 4 January.
- MABIN, A. (2013). *The Map of Gauteng: Evolution of a City-region in Concept and Plan*, Occasional Paper No. 5, Gauteng City-Region Observatory, Johannesburg.
- MABIN, A., BUTCHER, S., AND BLOCH, R. (2013). Peripheries, Suburbanisms and Change in Sub-Saharan African Cities, *Social Dynamics: A Journal of African Studies*, 39(2): 167-190.
- MACNAB, R. (1987). Gold their Touchstone: *Gold Fields of South Africa 1887-1987: A Centenary Story*. Johannesburg: Jonathan Ball.
- MAKHURA, D. (2015). *State of the Province Address*. Available at <http://www.brandsouthafrica.com/news/1158-moving-gauteng-forward-in-2015-the-state-of-the-province-address>, accessed 5 April 2015.
- MARKUSEN, A. AND PARK, S.O. (1993). The State as Industrial Locator and District Builder: The Case of Changwon, South Korea, *Economic Geography*, 69(2): 157-181.
- MASANGO, S. (2013). Interview conducted with local area planner for Region 7 in the City of Tshwane Metropolitan Municipality by Yasmeen Dinath and Khangelani Moyo, 13 March.
- MARTIN, R. AND SUNLEY, P. (2006). Path Dependence and Regional Economic Evolution, *Journal of Economic Geography*, 6(4): 395-437.
- MARTINEZ-FERNANDEZ, C., WU, C., SCHATZ, L., TAIRA, N., AND VARGAS-HERNANDEZ, J. (2012). The Shrinking Mining City: Urban Dynamics and Contested Territory, *International Journal of Urban and Regional Research*, 36(2): 245-60.
- MASHITILE, P. (2008). *State of the Province Address by the Premier of Gauteng, Paul Shipokosa Mashitile*, Gauteng Legislature, 16 February 2008. Available at <http://www.gautrain.co.za/newsroom/2009/02/state-of-the-province-address-by-the-premier-of-gauteng/>.
- MASSEY, D. (1995). *Spatial Divisions of Labour: Social Structures and the Geography of Production*, Second Edition. New York: Routledge.
- MBIBA, B. AND HUCHZERMAYER, M. (2002). Contentious Development: Peri-urban Studies in Sub-Saharan Africa, *Progress in Development Studies*, 2(2): 113-131.
- MCGAFFIN, R. AND GAVERA, L. (2011). *Taking Stock: The Development of Retail Centres in Emerging Economy Areas. Impact on Local Consumers, Local Businesses and the Local Economy, July: Urban Land Mark*.
- MENDELSON, R. (1991). *Sammy Marks: The Uncrowned King of the Transvaal*. Cape Town: David Philip Publishers.
- MERAFONG CITY LOCAL MUNICIPALITY. (2010). Local Integrated Transport Plan 2012-2013 (Second Draft LITP). Merafong City Local Municipality and West Rand District Municipality.
- MERAFONG CITY LOCAL MUNICIPALITY. (2011). *Draft Integrated Development Plan 2011-2016*. Merafong City Local Municipality.
- METH, P. (1998). Rethinking the Dumping Grounds: The Case of Bilanyoni. PhD thesis, University of Cambridge, Cambridge.
- MEYER, W. (2012). Early Hartbeespoort: The Transformation of a Rural Retreat; Kosmos: Schoeman's Special Retreat, and The Building of Hartbeespoort Dam: Forgotten Feature to be Resurrected, *Kormorant*, 17 January.
- MEYER, W. (2013) *Magaliesberg Kaleidoscope*. Pretoria: IRMEY.
- MICHEL, D. AND SCOTT, D. (2012). The La Lucia-Umhlanga Ridge as an Emerging 'Edge City', *South African Geographical Journal*, 87(2): 104-114.

- MORRIS, R. (2006). The Mute and the Unspeakable: Political Subjectivity, Violent Crime, and 'the Sexual Thing' in a South African Mining Community, in J. Comaroff and J. Comaroff (eds), *Law and Disorder in the Postcolony*. University of Chicago Press: Chicago: 57-101.
- MUBIWA, B. AND ANNEGARN, H. (2013). *Historical Spatial Change in the Gauteng City-Region*, Occasional Paper, No. 4, Gauteng City-Region Observatory, Johannesburg.
- MUNNIK, V. (2012). Discursive Power and Environmental Justice in the New South Africa: The Steel Valley Struggle Against Pollution (1996–2006), PhD thesis, University of the Witwatersrand, Johannesburg. Available at <http://cer.org.za/wp-content/uploads/2014/11/Munnik-PhD-Steel-Valley-struggle-2012.pdf>.
- MURPHY, P. AND BURNLEY, I. (1993). Socio-demographic Structure of Sydney's Perimetropolitan Region, *Journal of Australian Population Association*, 10(2): 127-144.
- MURRAY, C. (1987). Displaced Urbanization: South Africa's Rural Slums, *African Affairs*, 86(344): 311-329.
- NDAZAMELA, P. (2015). Private Sector Must Now Join the Party in IDC Space, *Business Day*, 3 February.
- NEL, E. AND BINNS, T. (2002). Decline and Response in South Africa's Free State Goldfields: Local Economic Development in Matjhabeng, *International Development Planning Review*, 24(3): 249-269.
- NELSON, A. (1992). Characterizing Exurbia, *Journal of Planning Literature*, 6(4): 350-368.
- NESTLÉ SOUTH AFRICA. (2011). *Nestlé to Invest R500m in SA: Add Two Factories to Local Portfolio*. Available at <http://Hammanskraal.nestle.co.za/media/pressreleases/nestletoinvestr500minsaad-twofactoriestolocalportfolio>, accessed 16 June 2013.
- NEWMAN, P AND KENWORTHY, J. (1989). Gasoline Consumption and Cities: A Comparison of U.S. Cities with a Global Survey, *Journal of the American Planning Association*, 55(1): 24-37.
- NIEUWOUDT, A. (2014). *The Rosslyn Automotive Supplier Park: A Critical Assessment from a Supply Chain Perspective*. Available at <http://dasresultat.com/wp-content/uploads/2014/06/2014-SAPICS-A-Nieuwoudt-White-Paper-Final.pdf>
- NORTH WEST PARKS AND TOURISM BOARD. (1997). *The Bojanala Region of the North West Province: Babelegi* [Homepage of Linx Africa]. Available at <http://Hammanskraal.tourismnorthwest.co.za/bojanala/babelegi.html>, accessed 13 June 2013.
- NORTH WEST PROVINCE. (2004). *Hartbeespoort Dam Remediation Project (Phase One)*. Available at <https://www.dwa.gov.za/Harties/documents/ActionPlanVol2Oct04.pdf>, accessed 2 April 2015.
- NORTON, R. AND REES, J. (2007). The Product Cycle and Spatial Decentralization of American Manufacturing, *Regional Studies*, 41(S1): 61-71.
- NATIONAL UNION OF MINEWORKERS (NUMSA). (2004). Press release, 24 November. Available at <http://www.numsa.org.za/article/tiger-wheels-to-retrench-700-workers-in-order-to-introduce-new-technology/>.
- ORGANISATION FOR ECONOMIC COOPERATION AND DEVELOPMENT (OECD). (2013). *State Owned Enterprise in the Middle East and North Africa: Engines of Development and Competitiveness*, OECD Publishing. Available at <http://dx.doi.org/10.1787/9789264202979-en>.
- PANDY, W. AND ROGERSON, C. (2013). The Timeshare Industry of Africa: A Study in Tourism Geography, *Bulletin of Geography. Socio-economic Series*, 21: 97-109.



Photograph by Clive Hassall

- PARKS, V. (2009). Access to Work: The Effects of Spatial and Social Accessibility on Unemployment for Native-born Black and Immigrant Women in Los Angeles, *Economic Geography*, 80(2): 141-172.
- PECK, J. (2011). Neoliberal Suburbanism: Frontier Space, *Urban Geography*, 32(6): 884-919.
- PELSER, A., VAN DER MERWE, A. AND KOTZE, P. (2012). *Rethinking Sustainability of Small Towns: Towards a Socio-technical Approach. Small Town Geographies in Africa: Experiences from South Africa and Elsewhere*. New York: Nova Science Publishers & Hauppauge.
- PHALATSE, M. (2000). From Industrialisation to De-industrialisation in the Former South African Homelands, *Urban Forum*, 11(1):141-161.
- PHALATSE, M. (2001). Abandoned Industrial Spaces in Post-apartheid South Africa: The Implications for Women in Mogwase, *South African Geographical Journal*, 83(2): 167-172.
- PHELPS, N. (1998). On the edge of something big: edge-city economic development in Croydon, South London, *Town Planning Review*, 69(4): 441-465.
- PHELPS, N. (2004). Clusters, Dispersion and the Spaces in Between: For an Economic Geography of the Banal, *Urban Studies*, 41(5-6): 971-989.
- PICKLES, J. (1991). Industrial Restructuring, Peripheral Urbanization and Rural Development in South Africa, *Antipode*, 23: 68-91.
- PLATZKY, L. (1992). The Development Impact of South Africa's Industrial Location Policies: An Unforeseen Legacy. PhD thesis submitted to the Institute of Social Studies, The Hague.
- QUANTEC. (2015). Quantec Easydata. Available at www.easydata.co.za.
- RANDOLPH, R. AND GOMES, P. (2007). Mobilidade e expansão do Rio de Janeiro para áreas perimetropolitanas, *Cadernos Metrópole*, 17:59-80.
- ROGERSON, C. (1974). Growth Point Problems: The Case of Babelegi, Bophuthatswana, *Journal of Modern African Studies*, 12(1): 126-130.
- ROGERSON, C.M. (1988). Regional Development Policy in South Africa, *Regional Development Dialogue*, 9: 228-255.
- ROGERSON, C. (1990). Sun International: The Making of a South African Tourism Multinational, *GeoJournal*, 22(3): 345-354.
- ROGERSON, C. (2005). *Ekurhuleni: Towards a Local Industrial Policy for Driving Pro-poor Growth and a People-centred Economy*, Case study prepared for the World Bank-Netherlands Partnership Program, Evaluating and Disseminating. Available at <http://siteresources.worldbank.org/INTLED/Resources/339650-1144099718914/ProPoorEkurhuleni.pdf>.
- ROGERSON, C. (2007). Tourism Routes as Vehicles for Local Economic Development in South Africa: The Example of the Magaliesburg Meander, *Urban Forum*, 18: 49-68.
- ROGERSON, C. (2011). Mining Enterprise, Regulatory Frameworks and Local Economic Development in South Africa, *African Journal of Business Management*. Available at <http://www.academicjournals.org/journal/AJBM/article-abstract/1B8C36823581>.
- ROGERSON, C. (2012). Mining-dependent Localities in South Africa: The State of Partnerships for Small Town Local Development, *Urban Forum*, 23(1): 107-132.
- ROGERSON, C AND ROGERSON, J (1997). Intrametropolitan Change in the Witwatersrand, 1980-1994, *Urban Forum*, 8: 17-42.
- ROGERSON, C. AND ROGERSON, J. (1999a). Intrametropolitan Industrial Change on the Witwatersrand, 1980-1994, *Urban Forum*, 8(2): 195-223.

- ROGERSON, C. AND ROGERSON, J. (1999b). Industrial Change in a Developing Metropolis: The Witwatersrand 1980–1994, *Geoforum*, 30: 85–99.
- ROSS, N. (2010). *The World Steps Up to the Water Quality Challenge: Communities, Governments Find Solutions*. Report for the Pacific Institute. Available at http://pacinst.org/wp-content/uploads/2013/02/water_quality_case_studies3.pdf.
- RUDOLPH, R. AND BRADE, I. (2005). Moscow: Processes of Restructuring in the Post-Soviet Metropolitan Periphery, *Cities*, 22(2): 135–150.
- SCOTT, A. (1988). Flexible Production Systems and Regional Development: The Rise of New Industrial Spaces in North America and Western Europe, *International Journal of Urban and Regional Research*, 12(2): 171–186.
- SEDIBENG DISTRICT MUNICIPALITY. (2011). *Sedibeng District Municipality Integrated Development Plan, 2011/12*. Sedibeng District Municipality.
- SEDIBENG DISTRICT MUNICIPALITY. (2012). *Sedibeng Growth and Development Strategy*. Available at http://www.sedibeng.gov.za/gds2/gds2_4.html.
- SEEKINGS, J. (1990). *Broken Promises: Discontent, Protest, and the Transition to Confrontation in Duduza, 1978–1985*, Wits History Workshop, 6–10 February. Available at <http://wiredspace.wits.ac.za/bitstream/handle/10539/8079/HWS-380.pdf?sequence=1>.
- SEIDMAN, G.W. (1993). Shafted: The Social Impact of Down-scaling on the Free State Goldfields, *South African Sociological Review*, 5(2): 14–34.
- SIMKINS, C. (2010). *Population Growth, Migration, Economic Growth and Poverty in Gauteng since the 1970s*, Southern Africa Labour and Development Research Unit, Working paper No. 47. Cape Town: SADRU, University of Cape Town.
- SIMON, D., MCGREGOR, D. AND NSIAH-GYABAAH, K. (2004). The Changing Urban–Rural Interface of African Cities: Definitional Issues and an Application to Kumasi, Ghana, *Environment and Urbanization*, 16(2): 235–248.
- SISULU, M. (2013). Personal communication conducted with Deputy Director of Spatial Strategic Planning in Tshwane Metropolitan Municipality by Peter Njiro, 13 March 2013.
- SMIT, W. (1998). The Rural Linkages of Urban Households in Durban, *Environment and Urbanization*, 10(1): 77–88.
- SOJA, E. (1996). *Thirdspace: Journeys to Los Angeles and Other Real-and-Imagined Places*. Oxford: Blackwell Publishers.
- SOUTH AFRICAN HISTORY ONLINE. (2011a). *1946 African Mine Workers Strike*, 21 March. Available at <http://www.sahistory.org.za/topic/african-mine-workers-strike-1946>
- SOUTH AFRICAN HISTORY ONLINE. (2011b). *Sharpeville Massacre, 21 March 1960*, 21 March. Available at <http://www.sahistory.org.za/topic/sharpeville-massacre-21-march-1960>.
- SPARKS, S. (2012). *Apartheid Modern: South Africa's Oil from Coal Project and the History of a South African Company Town*. PhD thesis, Department of Anthropology and History, University of Michigan. Available at http://deepblue.lib.umich.edu/bitstream/handle/2027.42/91528/sparkss_1.pdf?sequence=1.
- STATISTICS SOUTH AFRICA (STATS SA). (2012). *Selected Building Statistics of the Private Sector as Reported by Local Government Institutions, 2011*. P5041.3. Pretoria: Stats SA.
- STATISTICS SOUTH AFRICA (STATS SA). (2015). *Statistics by Place*. Available at <http://www.statssa.gov.za/>.

- STORPER, M. (1997). *The Regional World: Territorial Development in a Global Economy*. New York: Guilford Press.
- STURGEON, T. (2003). What Really Goes on in Silicon Valley? Spatial Clustering and Dispersal in Modular Production Networks, *Journal of Economic Geography*, 3(2): 199-225.
- SUNLEY, P. (2009). Relational Economic Geography: A Partial Understanding or a New Paradigm? *Economic Geography*, 84(1): 1-26.
- THE DEPARTMENT OF TRADE AND INDUSTRY (DTI). (2012). *Half a Billion Rand Investment Projects Launched in Babelegi* [Homepage of The Department of Trade and Industry]. Available at <http://Hammankraal.thedti.gov.za/editmedia.jsp?id=2470>, accessed 16 June 2013.
- THE HERITAGE PORTAL. (2014). *The Great Discovery of the West Wits Line*. Available at <http://www.heritageportal.co.za/article/great-discovery-west-wits-line-part-two>, accessed 20 April 2015.
- TIGER WHEELS LTD. (2002). Press release, 2 September. Available at http://www.sharenet.co.za/free/sens/disps_news.phtml?t-date=20020902143051&seq=1665&scheme=default.
- TIRO, G. (2014). Son of Babelegi. Masters Research report, Department of Journalism Studies, University of Witwatersrand. Available at <http://wiredspace.wits.ac.za/bitstream/handle/10539/17054/FinalDraft.pdf?sequence=2>.
- TODES, A. (1998). Socio-spatial Effects of Economic Restructuring: The Case of Newcastle, *Society in Transition*, 29(1-2): 40-57.
- TODES, A. (2000). Reintegrating the Apartheid city? Urban Policy and Urban Restructuring, in S. Watson and G. Bridges (eds), *A Companion to the City*: 617-629. London: Blackwell.
- TODES, A. (2013). *Spatial Targeting: Lessons from South African Experience*, Report for the Workshop on Spatial Targeting, hosted by South Africa's National Treasury and National Planning Commission, 3-4 October 2013. Available at http://led.co.za/sites/default/files/cabinet/orgname-raw/document/2013/alison_todes_-_background_paper_on_spatial_targeting_17092013.docx_.pdf.
- TODES, A. (2014). New African Suburbanisation? Exploring the Growth of the Northern Corridor of eThekweni/KwaDukuza, *African Studies*, 73(2): 245-270.
- TODES, A., KOK, P., WENTZEL, M., VAN ZYL, J., AND CROSS, C. (2008). *Contemporary South African Urbanisation Dynamics*, UNU-WIDER Conference: Beyond the Tipping Point. African Development in an Urban World, Cape Town, June.
- TRAPIDO, S. (1984). *Putting the Plough to the Ground: The History of Tenant Production on the Vereeniging Estates, 1896-1920*, University of the Witwatersrand, African Studies Institute.
- TRUTH AND RECONCILIATION COMMISSION. (1998). *Truth and Reconciliation Commission of South Africa Report: Volume 2*. Available at <http://sabctr.saha.org.za/originals/finalreport/volume2/volume2.pdf>
- TUROK, I. (1990). Public Investment and Privatisation in New Towns: A Financial Assessment of Bracknell, *Environment and Planning A*, 22, 1323-1336.
- TUROK, I. (2012). *Urbanisation and Development in South Africa: Economic Imperatives, Spatial Distortions and Strategic Responses*, Urbanisation and Emerging Population Issues Working paper No. 8. London: International Institute for Environment and Development, United Nations Population Fund, Population and Development Branch.

- URBAN FOUNDATION. (1991). *Regional Development Reconsidered*. Urban Debate 2010, No. 3. Johannesburg: Urban Foundation.
- VAN EEDEN, E. (1992). *Ekonomiese Ontwikkeling en die Invloed Daarvan op Carletonville, 1948–1988: 'n Historiese Studie*. Available at <http://dspace.nwu.ac.za/handle/10394/10795>.
- VAN EEDEN, E. (1997). So Long, Gold Mines, Long Live Industries? A Case Study of Carletonville's Battle for Survival, *South African Journal of Economic History*, 12(1-2): 103-127.
- VAN EEDEN, E. (1998) *The history of Gatsrand from the settling of the trekker community circa 1839 until the proclamation of Carletonville in 1948*, submitted for a Masters degree to the Potchefstroom University for Christian Higher Education. Available at <https://dspace.nwu.ac.za/handle/10394/10805>.
- VAN EEDEN, E. (2010). Using a Transdisciplinary Approach for Environmental Crisis Research in History, *TD: The Journal for Transdisciplinary Research in Southern Africa*, 6(1): 191-208.
- VAN HUYSSTEEN, E. (2001). Other Experiences of Planning for Reconstruction and Transformation: A Narrative of Planning and Development Histories in Hammanskraal-Temba, *Acta Structilia*, 8(1): 33-52.
- VAN HUYSSTEEN, E., ORANJE, M. AND MEIKLEJOHN, C. (2010). *Draft Paper: An Appreciative and [More] Nuanced Reading of Rural Settlements in South Africa: A Key to Unlocking the Nation's Rural Development Challenge?*, Planning Africa Conference, Durban 2010: Rural Development and Rural–Urban Inter-Relationships.
- VAN VUUREN, L. (2008). Taming the Poort, *Water Wheel*, May/June. Available at <http://www.ewisa.co.za/misc/DamNWHartebeespoort/Harties%20history%20WW%20May-June%2008.pdf>, accessed 1 April 2015.
- VAN WINDEN, W., VAN DER MEER, A., AND VAN DEN BERG, L. (2004). The Development of ICT Clusters in European Cities: Towards a Typology, *International Journal of Technology Management*, 28(3-6): 356-87.
- VERHOEF, G. AND DU PLESSIS, A. (1990). State Involvement in the Rehabilitation of Poor Whites by Means of Land Resettlement at Hartbeespoort Irrigation Scheme, *South African Journal of Economic History*, 5(1): 67-80.
- VERNON, R. (1981). State-owned Enterprises in Latin-American Exports, in W. Baer and M. Gillis, *Export Diversification and the New Protectionism: The Experience of Latin America, Bureau of Economic and Business Research*. Urbana-Champaign: University of Illinois, pp. 98-114.
- VICKERMAN, R. SPIECKERMANN, K. AND WEGENER, M. (2009). Accessibility and Economic Development in Europe, *Regional Studies*, 33(1): 1-15.
- VISSER, G. (2004). Second Homes: Reflections on an Unexplored Phenomenon in South Africa, in C. Hall and D. Muller (eds), *Tourism, Mobility, and Second Homes: Between Elite Landscape and Common Ground*, 196-214. Cleveland: Channel View Publications.
- VISSER, G. AND HOOGENDOORN, G. (2015). A Decade of Second Home Tourism Research in South Africa: Research Prospects for the Developing World?, *South African Geographical Journal*, 97(2): 111-122.
- WANG, Y.P., WANG, Y., AND WU, J. (2009). Urbanization and Informal Development in China: Urban Villages in Shenzhen, *International Journal of Urban and Regional Research*, 33(4): 957-973.
- WARD, C. (1993). *New Town, Home Town: The Lessons of Experience*. London: Gulbenkion Foundation.
- WELLINGS, P. AND BLACK, A. (1986). Industrial Decentralization in South Africa: Tool of Apartheid or Spontaneous Restructuring, *GeoJournal*, 12(2): 137-149.

WHYTE, I. (2002). *Landscape and History Since 1500*. London: Reaktion Books.

WILLIAMS, R. (1975). *The Country and the City*. Oxford: Oxford University Press.

WINDE, F. AND STOCH, E.J. (2010). Threats and Opportunities for Post-closure Development in Dolomitic Gold Mining Areas of the West Rand and Far West Rand (South Africa): A Hydraulic View. Part 1: Mining Legacy and Future Threats, *Water SA*. Available at <http://www.readperiodicals.com/201001/1965015121.html#ixzz3YK5Pa500>.

WOLFE, D. AND GERTLER, M. (2004). Clusters From the Inside and Out: Local Dynamics and Global Linkages, *Urban Studies*, 41(5/6): 1071-93.

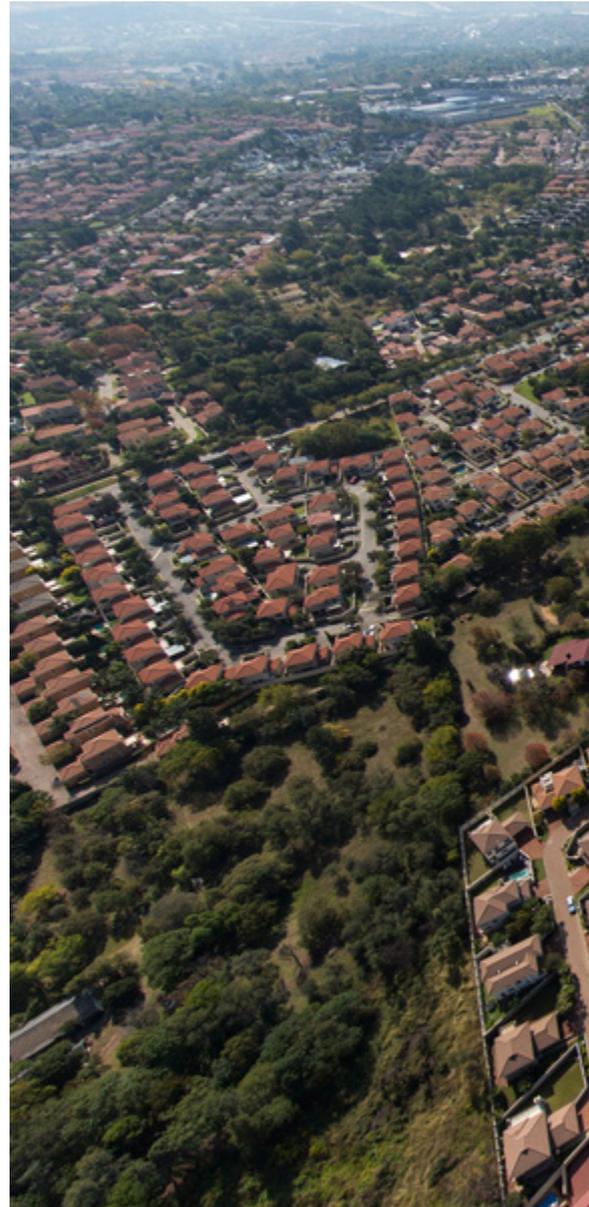
WORLD STEEL ASSOCIATION. (2016). *World Steel Figures 2016*. Available at <https://www.worldsteel.org/dms/internetDocumentList/bookshop/2016/World-Steel-in-Figures-2016/document/World%20Steel%20in%20Figures%202016.pdf>.

WU, F. (2016). Emerging Chinese Cities: Implications for Global Urban Studies, *The Professional Geographer*, 68(2): 338-348.

YAPING, W. AND MIN, Z. (2009). Urban Spill Over vs Local Urban Sprawl: Entangling Land-use Regulations in the Urban Growth of China's Megacities, *Land Use Policy*, 26: 1031-1045.

YU, X. AND NG, C. (2007). Spatial and Temporal Dynamics of Urban Sprawl Along Two Urban-Rural Transects: A Case Study of Guangzhou, China, *Landscape and Urban Planning*, 79: 96-109.

ZEKOVIĆ, S., SPASI, N., AND MARI, T. (2007). Development of New Economic Poles in Metropolitan Areas: Belgrade Example, *Spatium*, 15016: 21-27.





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GAUTENG CITY-REGION OBSERVATORY

6th Floor University Corner
11 Jorissen St (Cnr Jorissen and Jan Smuts)
Braamfontein
Johannesburg
Gauteng, South Africa

tel +27 11 717 7280
email info@gcro.ac.za
www.gcro.ac.za

