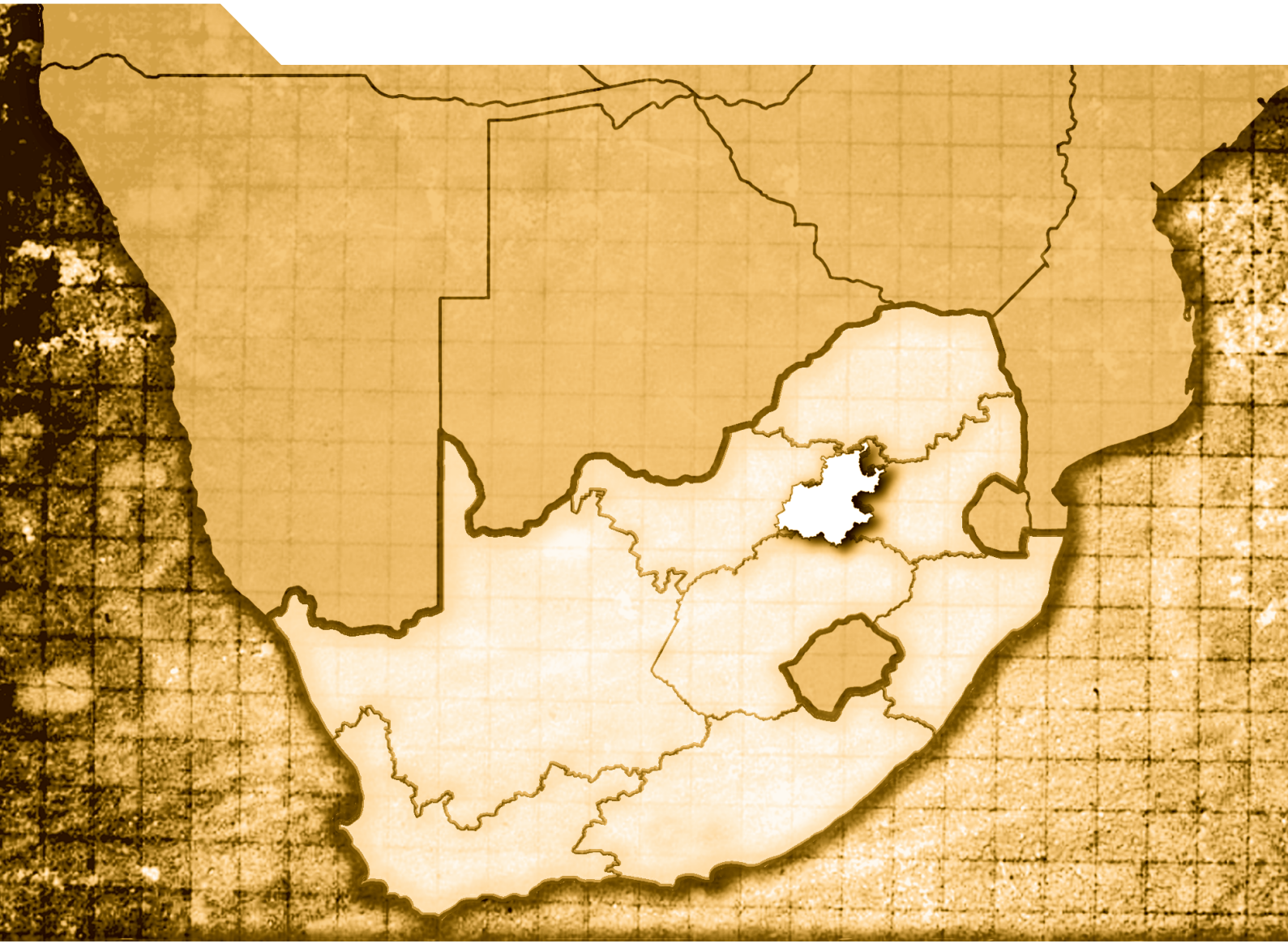
OECD Territorial Reviews

The Gauteng City-Region, South Africa



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OECD Territorial Reviews: The Gauteng City-Region, South Africa

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Foreword

Across the Organisation for Economic Co-operation and Development (OECD), globalisation is increasingly testing the capacity of regional economies to adapt and exploit their competitive edge, while also offering new opportunities for regional development. This is leading public authorities to rethink their strategies. Moreover, as a result of decentralisation, central governments no longer have the sole responsibility for development policies. Effective relations between different levels of government are now required in order to improve the delivery of public services.

The need to pursue regional competitiveness and governance is particularly acute in metropolitan regions. Although they produce the bulk of national wealth, metropolitan economies are often held back not only by unemployment and distressed areas but because opportunities for growth are not fully exploited. Effective metropolitan governance is called for if a functional region as a whole is to reach its full potential.

In 1999, the OECD, responding to a need to study and spread innovative territorial development strategies and governance in a more systematic way, created the Territorial Development Policy Committee (TDPC) and its Working Party on Urban Areas (WPUA), as a unique forum for international exchange and debate. Among the activities the committee has developed are a series of case studies on metropolitan regions that follow a standard methodology and common conceptual framework. This allows countries to share their experiences, and is intended to produce a synthesis that will formulate and diffuse horizontal policy recommendations.

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- **Germany:** Malte Bornkamm, Deputy Head of Division, European Regional Policy, Federal Ministry of Economics and Technology (BMWi);
- **Korea:** Nam Geon Cho, Transport Expert, Korea Research Institute for Human Settlements (KRIHS); and
- **United Kingdom:** Keith Thorpe, OBE, Head of Urban Policy Unit, Department for Communities and Local Government.

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Table of contents

Acronyms and abbreviations 11

Basic statistics of the Gauteng city-region 15

Assessment and recommendations 17

Chapter 1 **A growing but polarised city-region** 29

Introduction 30
1.1. The demographic and historical context of the Gauteng city-region 32
1.2. Socio-economic and environmental trends in the Gauteng city-region 44
1.3. Multiple dimensions of inequality 77
Notes 111
Bibliography 117

Chapter 2 **Addressing inequality and expanding economic opportunity** 127

2.1. Synopsis of economic development and spatial strategies in Gauteng 129
2.2. Confronting spatial inequality 133
2.3. Confronting economic inequality 158
2.4. Expanding and rescaling economic opportunity 176
Notes 191
Bibliography 199

Chapter 3 **Reforming city-region governance in Gauteng** 211

3.1. Streamlining intergovernmental relationships 214
3.2. Reforming national housing policy to confront spatial inequality 229
3.3. Harnessing financial tools to expand infrastructure and economic opportunity 229
3.4. Embedding the city-region concept in metropolitan transport and environmental policy 232
3.5. Strengthening participatory governance across the Gauteng city-region 244
Conclusion 251
Notes 254
Bibliography 261

Tables

Table 1.1. Direct backward linkages in Gauteng, 2007 60
Table 1.2. Monitoring learning achievement scores for numeracy, literacy and life skills, 1999 61
Table 1.3. Manufacturing turnover by technology class in Gauteng municipalities, 2010 64

Table 1.4. Gauteng municipal manufacturing employees by OECD technology class, 2010 65
Table 1.5. Turnover per employee per OECD manufacturing class, 2010 65
Table 1.6. Distribution of R&D by sectors: Gauteng (2009) and OECD regional average (2007) 66
Table 1.7. Total R&D expenditure and researcher full-time equivalents (FTEs) at Gauteng-based higher education institutions, 2007 and 2009 67
Table 1.8. Gauteng business expenditure on R&D by SIC code, 2008-09 68
Table 1.9. Highly important factors that hampered innovation activities of all enterprises, 2002-04 72
Table 1.10. Employment protection in OECD member and selected non-member countries, 2008 86
Table 1.11. Estimates of extreme poverty in South Africa's provinces, 1995 and 2008 94
Table 1.12. Scale of public housing provision in Gauteng and South Africa, 1994-2009 98
Table 1.13. Housing need in the Gauteng city-region, 2007 101
Table 1.14. Dwelling type by province in South Africa, 2001 and 2009 102
Table 1.15. Municipal service delivery in Gauteng, 2001 and 2007 106
Table 1.16. Walking time to train, bus and taxi access points by municipality in the Gauteng city-region, 2003 108
Table 2.1. Gauteng's Employment, Growth and Development Strategy (GEGDS) 132
Table 2.2. Transit-supportive residential density thresholds 153
Table 2.3. Types of services delivered by regional innovation agencies 179
Table 3.1. The assignment of government functions in South Africa 218
Table 3.2. Overlaps in municipal and provincial policy areas in the South African Constitution 226
Table 3.3. Function and modal divisions of the transport system in South Africa 240

Figures

Figure 1.1. Urban and rural population in South Africa 32
Figure 1.2. Trends in urbanisation by OECD country and South Africa 35
Figure 1.3. South African urban structure 36
Figure 1.4. Population density in the Gauteng city-region 39
Figure 1.5. Urban landcover in the Gauteng 39
Figure 1.6. Home-to-work commuting in Gauteng 40
Figure 1.7. Average annual population growth rate in OECD metro regions and in the Gauteng city-region, 1997-2007 41
Figure 1.8. Population density in South Africa, 2009 42
Figure 1.9. Economic density in South Africa, 2008 45
Figure 1.10. Provincial share of national GDP, 2008 45
Figure 1.11. Metropolitan GDP as a share of national economy, 2007 46
Figure 1.12. GDP annual average growth rate, 1995-2008 47
Figure 1.13. Regional contribution to national performance 48
Figure 1.14. GDP per capita annual average growth rate, 1995-2008 49
Figure 1.15. Municipal per capita GDP growth in the Gauteng city-region 49
Figure 1.16. Economic growth among OECD metro-regions 50
Figure 1.17. Decomposition of regional GDP per capita in South Africa 51
Figure 1.18. Regional disparities in South Africa, 1995-2008 52
Figure 1.19. Regional disparities at municipal level in South Africa, 1995-2008 52

Figure 1.20. Percentage of gross value-added by sector and subsector in Gauteng city-region, 2009 53
Figure 1.21. GVA annual growth rate for Gauteng and South Africa by subsector, 1995-2009 54
Figure 1.22. Sectoral GVA dynamics in Gauteng, 1995-2009 55
Figure 1.23. Growth in manufacturing wages in South Africa and other emerging economies 56
Figure 1.24. Total employment evolution in Gauteng in select sectors, 1995-2008 57
Figure 1.25. Sectoral employment dynamics in Gauteng, 1995-2008 58
Figure 1.26. Backward linkages and employment multipliers in the Gauteng city-region, 2007 59
Figure 1.27. Proportion of employed with higher education in South African provinces, 2008 61
Figure 1.28. Share of manufacturing in Gauteng by technological level, 2008 63
Figure 1.29. Provincial R&D expenditure, 2004-08 66
Figure 1.30. Patents in OECD metro-regions and in the Gauteng city-region, 2005 70
Figure 1.31. Particulate matter (PM_{10}) levels in select BRIICS cities, 2004 74
Figure 1.32. Electricity and heat output in South Africa, OECD enhanced engagement countries, OECD member countries and African countries 75
Figure 1.33. Municipal waste generation in OECD and BRIICS countries 77
Figure 1.34. Employment in South African provinces 78
Figure 1.35. Unemployment rate in South Africa and OECD member countries, 2010 79
Figure 1.36. Unemployment rates in South Africa by province, 2011 83
Figure 1.37. Unemployment rate in OECD metro-regions and in the Gauteng city-region, 2007 84
Figure 1.38. Gauteng's spatial mismatch 87
Figure 1.39. Proportion of informal employment by province, 2008 88
Figure 1.40. Intra-regional inequality in South African provinces, 1995-2008 89
Figure 1.41. Intra-regional inequality in the Gauteng city-region and a sample of OECD metro-regions, 2008 90
Figure 1.42. Interpersonal inequality in a sample of cities 91
Figure 1.43. Change in inequality in Brazil, China, India and South Africa, 1990s and 2000s 92
Figure 1.44. Urban and rural inequality in Brazil, China, India and South Africa 92
Figure 1.45. Concentrated poverty rates within Gauteng, 2003 95
Figure 1.46. Concentrated poverty rates in Gauteng and United States metropolitan areas, 2000 and 2003 95
Figure 1.47. Household income distribution by race in Gauteng, 2005 96
Figure 1.48. Location of RDP housing in job-poor neighbourhoods in Gauteng, 2008 99
Figure 1.49. Municipal housing prices in Gauteng 100
Figure 1.50. Public housing projects in Gauteng, 2008 103
Figure 1.51. Racial composition in Gauteng by median income level of residents in neighbourhood, 2005 104
Figure 1.52. Spatial distribution vs. income distribution of Black Africans in Gauteng, 2005 105
Figure 1.53. Service delivery protests in Gauteng, 2004-09 107
Figure 1.54. Transport access in Gauteng: rail, bus, taxi/minibus 108
Figure 2.1. Share of median house prices to median household income in selected cities in the OECD (Q3, 2009) 138
Figure 2.2. Proportion of household budget spent on transport in Africa 152

Figure 2.3. New and proposed development overlaid with the now rescinded Gauteng Urban Edge Delineation 154
Figure 2.4. Public social expenditure (excluding health) 166
Figure 2.5. Errors of exclusion (under-coverage) of cash transfer programmes 167
Figure 2.6. Responses to survey question, "Foreigners are taking benefits meant for South Africans" by dwelling type and education 172
Figure 3.1. Participation institutions 246
Figure 3.2. Responsibility of voters in holding local councillors accountable: South Africa and African countries, 2008 250

Acronyms and abbreviations

AFC	Automated fare collection
AIDC	Automobile Industry Development Centre
AsgiSA	Accelerated and Shared Growth Initiative for South Africa
BIS	Bus Information Services
BLA	Black Local Authorities
BRT	Bus Rapid Transit
CBD	Central business district
CBO	Community-based organisations
CBPWP	Community-Based Public Works Programme
CCMA	Commission for Conciliation, Mediation and Arbitration
CDM	Clean development mechanism
CHP	Combined heat and power
CIPRO	Companies and Intellectual Property Registrations Office
CoE	Centres of excellence
COG	Department of Co-operative Governance
COSATU	Congress of South African Trade Unions
CRA	Community Reinvestment Act
CSID	Corporate Strategy and Industrial Development Programme
DCOG	Department of Co-operative Governance
DED	Gauteng Department of Economic Development
DORA	Division of Revenue Act
DPLG	Department of Provincial and Local Government
EDA	United States Economic Development Administration
EIS	European Innovation Scorecard
EMV	Eurocard/Mastercard/Visa
EPWP	Expanded Public Works Programme
EXCO	Provincial Executive Council
FAR	Floor-area ratio
FDI	Foreign direct investment
FEDUSA	Federation of Unions of South Africa
FET	Further education and training
FNMA	Federal National Mortgage Association
FTE	Full-time equivalent

GCR	Gauteng city-region
GCRO	Gauteng City-Region Observatory
GED	General educational development
GEGDS	Gauteng Employment Growth and Development Strategy
GEM	Global Entrepreneurship Monitor
GHIS	Gauteng Household Interview Survey
GPRA	United States Government Performance and Results Act
GSDF	Gauteng Spatial Development Framework
GVA	Gross valued added
HAD	Housing Development Agency
HSRC	Human Sciences Research Council
ICT	Information and communications technology
IDO	Innovation Development Office
IDP	Integrated development plans
IGR	Intergovernmental relations
ILO	International Labour Organisation
IPC	International Patent Classification
ITS	Intelligent transport systems
IWT	Agency for Innovation through Technology
JIPSA	Joint Initiative for Priority Skills Acquisition
LDGH	Department of Local Government and Housing
LFS	Labour Force Survey
LFTEA	Less Formal Township Establishment Act
MDB	Municipal Demarcation Board
MEC	Member of the Executive Council
MFMA	Municipal Financial Management Act
MIG	Municipal Infrastructure Grants
MLA	Monitoring Learning Achievement
MMC	Members of Mayoral Committees
MTSF	Medium-Term Strategic Framework
NACTU	National Council of Trade Unions
NCOP	National Council of Provinces
NDi	National development indicators
NDoH	National Department of Housing
NDP	Neighbourhood Development Programme
NDPG	Neighbourhood Development Partnership Grant
NECSA	Nuclear Energy Corporation of South Africa
NEDLAC	National Economic Development and Labour Council
NERSA	National Energy Regulator of South Africa
NGO	Non-governmental organisations

NLTTA	National Land Transport Transition Act
NQF	National Qualification Framework
NSDI	National Spatial Data Infrastructure
NSDP	National Spatial Development Perspective
NUDF	National Urban Development Framework
OHS	October Household Survey
ONS	Office for National Statistics
PCF	Premier's Co-ordinating Forum
PGD	Provincial Growth and Development Strategies
POA	Intergovernmental Programme of Action
PSC	Public Services Commission
QLFS	Quarterly Labour Force Survey
R&D	Research and development
RDP	Reconstruction and Development Programme
SADC	South African Development Community
SALGA	South African Local Government Association
SANRAL	South African National Road Agency Limited
SAQMEC	Southern and Eastern African Consortium for Monitoring Educational Quality
SBD	Suburban business districts
SDF	Spatial Development Framework
SER	Standard employment relationship
SETA	Sectoral Training and Education Authorities
SHS	Sustainable human settlements
SMART	Safe, mixed-income, accessible, reasonably-priced, transit-oriented
SME	Small and medium-sized enterprises
SMME	Small, micro and medium enterprises
SPV	Special purpose vehicles
TES	Temporary employment services
TIMSS	Trends in International Mathematics and Science Study
TOD	Transit-oriented development
TVSD	Technical and vocational skills development
USDG	Urban Settlement Development Grant
VPADD	Voluntary, pro-active deal-driven
WIPO	World Intellectual Property Office

Basic statistics of the Gauteng city-region

Non-comparative data				
Population (2010)				11.2 million inhabitants
% of national population				22.4%
Land area				18 178 km^2 (between Berlin and New York metro-regions)
GDP per capita (USD current prices, 2008)				USD 14 906
GDP growth rate (2009)				-1.7%
Gauteng's contribution to national GDP (2009)				33.9%
Share of GDP of Africa				11%
Employment rate (Q1, 2011)				73.1%
Unemployment (narrow) (Q1, 2011)				26.9%
Share of national R&D (2008-09)				52.2%
Share of national patents (2004)				57%
Share of national trade (2009)				62.7%
Share of provincial GDP in exports (2009)				41.6%
Three largest FDI investors in Gauteng (2007)				China (26%), Germany (16%), United Kingdom (16%)
Share of working-age population (15-64) with tertiary education				15.5%
Share of national tertiary degrees conferred each year (2009)				41.7%
Share of population earning less than ZAR 283 (PPP USD 4.80) a month (2008)				6%
Racial composition	Black African 75.2%	White 18.4%	Coloured 3.7%	Indian/Asian 2.7%
Illiteracy rates by race (2008)	20.7%	2.7	6.7%	6.5%
Share of unemployed population in Gauteng	92.9%	2.8%	3.4%	1%
Percentage in informal dwellings (2009)				22.3%
Percentage in informal settlements (2009)				13.6%
HIV positive/AIDS population (2008)				11.7%
Life expectancy				51 years
Fertility rate				2.1 children
Share of national land area				1.5%
Land use				15% urban, 24% cultivated, 5% water, 50% trees/woodlands/wooded grassland/grassland, 5% degraded, bare or natural rock.[1]
Average commuting time (2000)				35 minutes
Share of private transport vehicles in South Africa				42.2%

Comparative data: ranking in *OECD Metropolitan Database*	
Average annual population growth rate (1997-2007)	2.8 times higher than OECD metro-region average
Population size (2007)	2.1 times larger than OECD metro average
Population density (2007)	15.1% below OECD metro-region average
Unemployment rate (2007)	4.3 times larger than OECD metro-region average
Per capita GDP (in PPP) (2007)	92.4% lower than OECD metro-region average
Metropolitan GDP as share of national economy (2007)	7.9 times larger than OECD metro-region average
Elderly dependency rate (2005)	70.3% lower than OECD metro-region average
Patents per million inhabitants (2004)	29.5% lower than OECD metro-region average

1. Based on 2009 land cover imagery from GeoTerraImage (GTI).

Sources: Multiple sources including the *OECD Metropolitan Database*; Statistics South Africa (2010), "Mid-year Population Estimates 2010", *Statistical Release P0302*, Statistics South Africa, Pretoria; Gauteng Provincial Treasury (2009a), *Provincial Economic Review and Outlook 2009*, Gauteng Provincial Government (Treasury), Johannesburg; Gauteng Provincial Treasury (2009b), *Socio-Economic Review and Outlook 2009*, Gauteng Provincial Government, Johannesburg; Statistics South Africa (2006), *Income and Expenditure Survey 2005-06*, Statistics South Africa, Pretoria; Statistics South Africa (2010), *Labour Force Survey*, Q4 2010, Statistics South Africa, Pretoria; Quantec EasyData; Gauteng Department of Roads and Transport (2006), *Gauteng Transport Study 2000*, Gauteng Provincial Government, Johannesburg.

Assessment and recommendations

A growing mega-region tackles the spatial challenges inherited from apartheid

The Gauteng city-region is one of the fastest growing city-regions in South Africa. The functional city-region is largely coterminous with the administrative borders of the Gauteng Province, which was created in 1994, a few months before the country's first democratic elections. Within the city-region, the population has grown particularly rapidly, thanks to in-migration. The population increased by 3.2 million residents between 1995 and 2009, at a rate of 2.6% annually, as compared with the national rate of 0.6%. In the period between 1997 and 2007, Gauteng's growth rate, more than 2.7% annually, was nearly three times the average for OECD metro-regions (0.96%). This rapid urbanisation has reinforced the spatial segregation instituted under apartheid. Meanwhile, population growth has been concentrated in a few locations and has resulted in strong spatial polarisation, urban sprawl and tracts of under-utilised land between main urban centres. This pattern of development not only reinforces existing inequalities but generates high economic and environmental costs. If properly managed, however, the city-region's potential for growth could be huge.

The economic driver of South Africa

The Gauteng city-region is not only the most urbanised but also the wealthiest province in South Africa. Gauteng accounts for 34% of national GDP. Compared to the 90 other OECD metro-regions, Gauteng ranks 14th in terms of its contribution to national GDP, i.e. above metropolitan Tokyo's share of Japan's GDP or metropolitan Paris' contribution to the French economy. While the Gauteng city-region's GDP per capita is comparable to that of Mexico City and Istanbul, the South African national average is more than a third lower than the national averages of Turkey and Mexico. Gauteng is also South Africa's engine of growth. Over the 1995-2008 period, the Gauteng city-region's economy grew at an annual average rate of 3.6%, and growth in some years, such as 2006 and 2007, exceeded 6%. For every additional 1% share of population in the province, 1.6% is added to its contribution to national growth, which implies higher productivity than in other parts of the country.

A continental leader in innovation

Gauteng, the hub of innovation in South Africa, leads the nation in research and development (R&D), accounting for 52.2% of total national expenditure on R&D in 2008-09. Gauteng's R&D as a percentage of GDP stands at 1.45%, comparing favourably with the OECD regional average of 1.58%. Within South Africa, the business

sector in Gauteng is the leading contributor to R&D (64.7%), which places it at the level of entrepreneurial Catalonia (65.0%), Ontario (62.0%) or New York state (67.1%).

In terms of patenting, the Gauteng city-region generates the majority of patents in South Africa (57% in 2004), though its level per capita ranks in the bottom quartile of OECD metro-regions. Gauteng's leading patenting sectors were machinery and equipment (171 patents), furniture (60 patents), fabricated metal products (45 patents) and chemicals (39 patents). Comparative analysis indicates that Gauteng's level of patent applications per million inhabitants stands at approximately 49 patents, placing it in the league of Leeds, Busan, Birmingham, Rome and Budapest.

Low productivity is holding back growth

Despite its high contribution to the national GDP and GDP growth, Gauteng is underperforming in terms of GDP growth per capita. This is probably the result of high population growth and the massive inward migration to the province. Its economic growth rate, at an annual average of 0.8% between 1997 and 2007, ranks close to those of Ankara and Naples (71st of 91 places). This figure is half that of the average for OECD metro-regions. South Africa's economy contracted in the economic crisis, and its growth rate fell into negative territory, from highs of more than 6% before the global financial crisis, to -1.7% in 2009. This low performance stemmed chiefly from productivity levels that did not keep in step with the growth of the labour force. Despite the benefits of migration and a growing number of workers, low productivity has been holding back further economic growth and needs to be addressed.

The persistence of unemployment and economic exclusion

Gauteng city-region's unemployment rate (26.9%, Q1 2011) is the highest among OECD metropolitan regions, although the region experienced a significant improvement in this respect during the years of strong economic growth between 2004 and late 2008. Unemployment peaked in the first quarter of 2003 at 31.9%, and then steadily declined, to 20.7% in the fourth quarter of 2008. As in many regions around the world, the financial and economic crisis drove the rate higher. The current unemployment rate of 26.9% is not out of line in South Africa, which suffers from chronic mass unemployment on a scale rarely found anywhere in the world. Although Gauteng's situation is slightly better than the South African average, the recent rise in unemployment during the crisis and the fall in real GDP indicate how vulnerable it is to external shocks. The decline of the mining sector and contracting job creation in the services sector has exacerbated the economic situation. Further statistical tests reveal that unemployment is not equally distributed across space, race and gender in the Gauteng city-region. In 2008, Sedibeng municipality suffered the highest unemployment rate (30.0%), followed by Ekurhuleni (25.8%), West Rand (22.8%), Johannesburg (20.3%), Tshwane (12.6%) and Metsweding (12.6%). Unemployment in the Gauteng city-region is also affected by a number of other factors, including gender, age, ethnicity and HIV, which has infected 11.7% of the population. The HIV-positive population in Gauteng did, however, decline by 50 000, from 1.25 million in 2004 to 1.2 million in 2008.

An alarming level of inequality – in income, race and school quality – undercuts the benefits of GDP growth

High levels of inequality have undercut the benefits of GDP growth. Inequalities within municipalities in the Gauteng city-region are among the lowest in South Africa, but are growing rapidly. The level of intra-municipal inequality is close to the average for OECD metro-regions but in the case of Gauteng, it is also accompanied by a particularly high level of extreme poverty, among approximately 6% of the population in 2008. Measured by the Gini coefficient, it registers a high degree of inequality in personal income. In a UN-HABITAT sample of 100 cities, the city of Johannesburg ranks as the most unequal. With a Gini value of 0.73, Johannesburg is vastly above the 0.4 international alert level and the rates of Mexico City (0.56), Accra (0.50) and Shanghai (0.32).

Income is unevenly distributed among the races, and Black Africans earn disproportionately low levels of income. While Black Africans make up 73.6% of Gauteng's population, 95.8% of households in the lowest income band (ZAR 0-ZAR 7 249) are Black African. In this same income band, only 2.1% of residents are white, though they make up 20.7% of Gauteng's population. For the coloured population, Gauteng's representation is 2.5%, while 1.5% is in the lowest income band. Indians/Asians comprise 2.8% of Gauteng city-region's population, and 0.5% are in the lowest income band. On the other hand, in the highest income band (ZAR 450 000+), whites are overrepresented (75.8%), with Indians/Asians at 3.0% and coloured at 10.5%. Black Africans are grossly underrepresented, making up only 10.8% of the highest-income households. Similar racial disparities were found for unemployment, poverty and educational attainment.

Findings based on a spatial analysis of poverty indicate a high, but decreasing level of economic segregation in the Gauteng city-region. Gauteng's concentrated poverty rate (i.e. the rate of poor living in high-poverty neighbourhoods) stands at 38.6%. The rates in Sedibeng (64.1%) and in Ekurhuleni (54.7%) are particularly egregious. This level of economic segregation means that Gauteng's poor must deal with lower quality schools, inadequate infrastructure and social networks with a high level of unemployment. The spatial analysis confirmed that low-income Africans disproportionately live in deprived neighbourhoods compared to low-income residents of other population groups, limiting their ability to take advantage of economic opportunities and the social networks in less disadvantaged areas. Nevertheless, a rising degree of concentration of Black Africans in high-income neighbourhoods suggests that racial desegregation is occurring.

Achievements in education despite gaps in tertiary attainment, desertion and skill mismatches

Considerable achievements have been made in increasing formal schooling and tertiary education levels in South Africa since the end of apartheid. According to the *General Household Survey* (2010), the proportion of adults lacking any formal schooling in Gauteng was almost halved between 2002 and 2010, dropping from 4.5% to 2.9%, and is much lower than the national average, which dropped from 10.9% to 7.0% over the same period. These figures suggest that the huge investment in education by the post-apartheid government has been paying off, although there are still concerns over the

quality of the education given and the results achieved. In the Gauteng city-region, 15.5% of the working-age population (15-64) has a tertiary education. While only 11.8% of Black Africans 25 years and older attained tertiary education in 2010, the proportion was some four times higher for whites, at 42.2%. Deficiencies in education and training contribute to skill mismatches.

Untapped opportunities in the manufacturing sector and the green economy…

Gauteng benefits from a diverse economy. A strong tertiarisation process has occurred: in 2008, 70.3% of total gross valued added (GVA) was derived from services, followed by manufacturing, electricity and gas, and construction (27.1%), and the primary sector (2.6%). Manufacturing has emerged as a clear opportunity for boosting employment and exports in the region since it is connected upstream to suppliers in other sectors with potential for greater multiplier effects. The Gauteng city-region could also become a green technology export centre for the South African Development Community (SADC) region. The New Growth Path policy, for example, projects the creation of 300 000 additional direct jobs by 2020 to green the economy, with 80 000 in manufacturing and the rest in construction, operations and the maintenance of new environmentally friendly infrastructure throughout South Africa. However, improvements are particularly needed in renewable energy, given that South Africa is the most coal-dependent economy in the world, with coal-driven power stations accounting for about 90% of electricity generation in the country.

... in innovation ...

The Gauteng city-region could build upon its position as South Africa's innovation hub to broaden economic development for SMEs and start-ups. Innovation in South Africa is held back by low levels of entrepreneurial activity, in comparison with both advanced and developing countries. The low level of start-up and survival of firms in South Africa, particularly SMEs is due to a combination of factors, including lack of access to commercial finance, high interest rates and under-developed skills. In particular, the highly concentrated market structure dominated by established businesses tends to be associated with lower output and employment and higher prices in the affected sectors. Applying the OECD classification of manufacturing industries based on technology, Gauteng's industry is led by medium-low tech (40.3%) and followed by low-tech (29.1%), medium-low (26.6%), and lastly, high-tech (4.1%).

...and entrepreneurship

Data on entrepreneurship suggest an environment in which new business start-ups have more difficulty surviving than in other countries. The Global Entrepreneurship Monitor (GEM) reports that 5.9% of South African adults between the ages of 18 and 64 own and manage a start-up business (less than 3.5 years old), a rate that compares poorly with that of Brazil (15.3%), Uganda (33.3%), Peru (20.9%), Algeria (16.7%), China (18.8%), and the average for low- to middle-income countries (14.8%). In terms of established business activity, i.e. the ownership and management of an established business that has survived for more than 3.5 years, South Africa ranked last out of the

54 countries surveyed, with an established business rate of only 1.4%. The average for all GEM countries is 7.7%, almost six times the rate for South Africa. The Gauteng Provincial Government and municipalities have developed programmes of financial and non-financial support for SMEs, including most notably the Gauteng Enterprise Propeller, but further innovation in government assistance is needed to address barriers to entry.

In spite of a dramatic delivery of public housing, a persistent housing backlog amplifies inequality and spatial disparities

Gauteng should be acknowledged for its dramatic delivery of public housing after the collapse of apartheid. Between 1994-95 and 2002-03, almost 1 million housing subsidies were approved in the city-region, and a total of 340 331 public housing units were built under the Reconstruction and Development Programme (RDP). The 797 000 RDP dwellings constructed over a 15-year period is a significant achievement, representing 27% of all housing delivery in the country for this period.

However, the housing backlog in the city-region is increasing by over 50 000 units per year. The failure of Gauteng's formal market to provide affordable housing has increased the housing backlog. The low level of housing affordability in Gauteng is striking. Compared to other large cities in the OECD, indicators suggest that Gauteng's homeowners pay an extremely high cost for housing relative to their income. The results of an analysis using the median multiple (the ratio of median house price to the median household income in a city) established that individuals in the Gauteng city-region would need 23 times their annual salary to buy a home.

The Gauteng city-region is marked by high levels of subsidised housing in peripheral "job-poor" zones and a dysfunctional secondary housing market. No subsidies are given to low-income residents to rent in moderate-income neighbourhoods, as is common throughout OECD member countries. This has resulted in a degree of "ghettoisation" that has trapped communities in sub-optimal employment circuits and reinforced the spatial mismatch between employment and residences. Furthermore, in the secondary housing market, high access barriers to urban land markets and low turnover rates in former African township areas and low-income neighbourhoods are typical. In the last decade, starting with the Breaking New Ground national housing strategy of 2004, policies have moved from the "one plot, one house" model of public housing and taken a more differentiated and multi-faceted approach.

Given the aforementioned challenges, South Africa could consider introducing a rent subsidy voucher programme to give recipients the freedom to choose the kinds of housing and the locations that best meet their needs. This would provide a rent subsidy, but would not cover the capital costs of home construction or purchasing. This tool could help Gauteng confront its high levels of neighbourhood poverty and economic segregation, while catalysing the development of a construction sector attuned to moderate-income housing. The experience of the housing voucher programme in the United States shows that, when given the choice, residents move to lower poverty, less segregated neighbourhoods. Voucher programmes are not panaceas, however, and complementary programmes would be needed to maximise their effects, e.g. assistance/counselling to help recipients identify rental opportunities, extensive landlord outreach to expand rental options available to voucher recipients, and inter-municipal collaboration on the voucher programme.

With few affordable options, residents have entered the informal housing market *en masse*. Gauteng has a large percentage of households living in informal or traditional dwellings (22.3% in 2009), slightly less than the South African national average of 23.7%. Informal settlements are spreading throughout the Gauteng city-region, compounding the challenge of providing capital upgrades in a cost-efficient manner and urban development along planned economic nodes. Data suggest that a new spatial geography of informality is emerging, with smaller informal settlements of less than 3 000 households.

Public transit capacity and affordability are not keeping pace with the population in a polycentric region

A groundswell of infrastructure programmes testifies to the government's realisation that the lack of a polycentric metropolitan transport system has limited inter-firm linkages, agglomeration economies and intra-regional trade. Numerous projects have been launched to bind the region together through additional bypasses, rail links and road improvements. The most notable projects include Gautrain and Johannesburg's new Bus Rapid Transit (BRT) programme. These efforts are promising in their potential to strengthen network effects between Tshwane, Johannesburg, Ekurhuleni and other areas in Gauteng. A more tightly connected system could optimise local supply chains, which often spill over multiple districts. Likewise, such a system can better confront the socio-spatial segregation.

Data confirms that the Gauteng city-region still struggles with considerable service backlogs inherited from the apartheid era. Public transport access is very low, which reduces mobility and raises the cost of transport. Comparing transport affordability in African cities, i.e. the proportion of household budget spent on transport, the Gauteng city-region ranks as the least affordable city. Currently, typical residents in Gauteng spend 21% of their monthly income on transport, significantly above rates in Lagos, Nairobi and Dar es Salaam. In Gauteng, 54.2% of citizens do not live within walking distance of a train station and 43.7% do not live within walking distance of a bus station. Only 9.5% of the population use rail to commute to work, in contrast to the much higher rates for Cape Town (17.0%) or Seoul (32.5%). Equally important, commuting data shows that the commuting burden falls on residents in public housing projects, which tend to be located in peripheral locations in Gauteng. Nevertheless, analysis indicates improvements in travel times in low- and middle- income areas and positive trends in the provision of services in the Gauteng city-region.

Urban models suggest that infrastructure and transport are in need of adapting to the city-region's polycentric structure. Flows have increased across the Gauteng city-region, particularly between the centres of Johannesburg, Tshwane and Ekurhuleni. Another smaller flow occurs into Johannesburg from various points on the West Rand, most notably from Krugersdorp and surrounding areas in Mogale City, and to a lesser extent in from Randfontein, Westonaria and Merafong City. There are also increasing flows of freight and commuter traffic between the core cities in Gauteng and outlying cities such as Rustenburg, which is growing rapidly as one of the world's most important sources of platinum group metals. The construction of the Gautrain system is expected to increase intra-metropolitan commuting, especially along the Johannesburg-Tshwane corridor, but feeder networks are needed to respond to the Gauteng city-region's polycentricity.

Mounting environmental challenges with public health impacts from waste and air pollution

Inadequate water provision, rising water contamination (including the result of acid mine drainage) and low levels of recycling compromise the environmental quality of the Gauteng city-region. The cost of potable water provision and sewage treatment is increased by water contamination and unlawful water abstraction. An analysis of environmental indicators suggests negative implications for local health and human capital. Upper respiratory problems related to air quality have resulted in estimated expenditures of ZAR 280 million per year in Johannesburg. Air pollution from vehicle emissions and domestic fuel combustion is a key contributor to respiratory hospitalisations and leukaemia cases in the Gauteng city-region. In Gauteng, particulate matter (PM) levels pose a particular threat, as they frequently exceed national and international air-quality standards. Particulate matter is more harmful to human health than most other forms of air pollution and is linked to deaths from cardiovascular disease, respiratory disease and lung cancer. In Johannesburg, PM_{10} concentrations across the city frequently exceed national air-quality standards.

Promising opportunities in recycling and waste-to-energy processing

Though a large share of waste still goes to landfills in Gauteng, elevating the region's greenhouse gas emissions, current projects for recycling show potential. Only 2% of the city of Johannesburg's waste is currently recycled or recovered in buy-back centres, material recovery facilities and drop-off centres. These landfills represent a missed opportunity to dispose of waste more cost-effectively through recycling and waste-to-energy processing. The potential can be seen in the Waterval region of northern Johannesburg, where the city has initiated a major sort-and-recycle pilot project, using independent small-scale contractors. In another example, the PET Plastic Recycling (PETCO) initiative in Gauteng recycled approximately 22% of PET (polyethelene terephthalate) beverage bottle sales from 2000-07, while creating approximately 10 000 jobs.

Confronting economic inequality

To ensure that growth benefits Gauteng's residents, specific measures to confront economic inequality could be prioritised and expanded. However, given the dominance of the informal economy in several neighbourhoods and its potential to absorb residents who cannot find jobs in the regulated sector, economic policies could better support multiple livelihood strategies. Given the projected growth of the population, particularly in informal settlements, programmes that aim to reduce economic inequality could also be improved by including a specific focus on unemployed youth. Specific recommendations include:

- Improving education and apprenticeship programmes: upgrade apprenticeship training, improve the relevance of training in public institutions, and spearhead a province-level campaign to attract and retain teachers, perhaps by offering wage

premiums and loyalty bonuses; expand co-operation with private sector-led apprenticeships.

- Raising employment through improved labour market policies: consider financing a pilot project to introduce cash transfers to create income-generating activity, provide support for efforts under way to achieve better "job matching".
- Providing support to the working poor in the informal economy: develop a jobs creation model for workers in the informal economy; better tailor labour market interventions to a labour force that is mobile between the informal and formal categories of employment.
- Improving analysis of unemployment in South Africa to better inform employment policy: the methodology of the South African Census could be improved to reflect discouraged workers, reservation wages, survival strategies and several other issues.
- Integrating immigrants into the Gauteng city-region economy: conduct a robust evaluation of immigrant settlement and employment patterns in Gauteng and undertake an exhaustive audit of the integration services that are provided.
- Improving labour market security for all workers: approve additional measures to regulate the spread of labour broking in the Gauteng city-region, and ensure better monitoring and reporting to improve occupational health and safety in and around the workplace.

Confronting spatial inequality by improving housing affordability and mobility

Building more inclusive neighbourhoods will mean expanding current programmes and investing in upgrading infrastructure and urban renewal in low-income areas, as well as improving mobility, housing affordability and a rescaling of local economic development programmes. After the introduction of the Gautrain and Johannesburg's Bus Rapid Transit programme (Rea Vaya), low-income neighbourhoods stand to gain from the creation of inter-firm linkages. Changes in regulations and public transport development are crucial to enhance mobility within the region, which now presents a major impediment to the efficient functioning of the labour market and contributes to the high unemployment and search costs in the city-region. Specific recommendations include:

- Increasing the supply of modest-cost housing: incubate a larger non-profit housing development community, encourage homebuilders and building materials manufacturers to provide home credit for the bottom of the income pyramid, pursue existing policy innovations with a human settlement approach to public housing by promoting inclusionary housing and exploring options for rental subsidies.
- Improving mobility by enhanced transport-oriented development and growth management: develop mechanisms to encourage drivers to switch to public transport (especially Gautrain and Rea Vaya); support broader experimentation with transit-oriented development, given its potential to raise density and land values around transport hubs; institute a unified fare system; encourage multi-story houses (apartments) as a tool of densification.

Reform national human settlement policy to confront spatial inequality

The imperatives of the spatial inequality faced in the Gauteng city-region dictate immediate action. As one of the most spatially unequal city-regions in the world, it could more effectively implement an integrated approach to urban management, including the co-ordination of major policy arenas such as public transport, environment and land use. Upgrading low-income and informal settlements would benefit from increased private-sector participation and citizen engagement. Concurrent mandates in land management, where the jurisdiction of provincial and municipal governments overlap, could be resolved. Setting aside well-located public land for low-income housing is essential for achieving human settlement policy goals.

Expanding economic opportunity at the city-region level

More initiatives are needed to improve the regional innovation system and lower the cost of doing business in Gauteng. Given Gauteng's dominance in patenting within South Africa and its share of the national services sector, a range of policies could be introduced to capitalise on Gauteng's dynamism. Specific recommendations include:

- Positioning economic development policy in a city-region framework: inter-firm linkages among industrial districts need to be better understood and strengthened through additional value-chain approaches.
- Improving productivity growth: expanding tertiary and vocational education; enhancing firms' technological capacity.
- Expanding Gauteng's green growth: position the Gauteng city-region to lead the creation of new green growth sectors (such as renewable energy, clean tech and clean production processes) in Africa and beyond; expand the solar energy sector.
- Developing innovation in Gauteng: expand experimentation with clusters in Gauteng, which are limited in number at present and confined to the manufacturing sector; build an extensive electronic database on patents and make it publicly accessible; develop a system to enhance and monitor progress in the development of a regional innovation system.
- Building mega-infrastructure for a mega-region: upgrade transport facilities by applying intelligent transport systems to increase the efficiency of the network; expand city-region broadband; improve inter-modal connections across public and private transport providers; address current and future bulk infrastructure needs.

Enhancing the effectiveness of governance

Foster intergovernmental collaboration

Intergovernmental collaboration carries the potential to advance a cross-cutting regional approach for the Gauteng city-region. If executed efficiently, a "whole of government" approach could help realise the goal of the National Spatial Development Perspective (2006) to "bring about synergy and complementarities in terms of the spatial effects of government action, with a view to maximising the overall social and economic returns on government development spending". The current sectoral focus of major policy arenas such as public transport, environment and land use, and economic development could be more effectively balanced with a ''territorial" approach, where the various levels of governance work together to maximise economic competitiveness. Such initiatives as the Gauteng Spatial Development Framework (GSDF), which identifies a spatial vision and attempts to integrate the forward planning of all sectors that impact spatial development, merit further support. Policies and funding regimes impacting spatial planning are governed by several different national ministries, with objectives that sometimes conflict. Specific recommendations include:

- Maintain the strategic importance of municipalities' integrated development plans in providing a demand-driven vision based on a deliberative process that cuts across sectoral departments, civil society and the private sector.
- Develop a more robust and empirically grounded understanding of the causal drivers of misalignment in intergovernmental relations and of ways to correct it.
- Continue co-ordination of the Gauteng Provincial Government's Employment, Growth and Development Strategy (GEGDS) with provincial policies, especially the Gauteng Spatial Development Framework (GSDF). Widen the policy debate to include a discussion on how the GEGDS can connect to or complement economic planning instruments available to municipalities as well as the integrated development plans.

Harness financial tools to expand infrastructure and economic opportunity

The post-apartheid package of reform created a sub-national institutional framework, but funding remains a challenge. Only limited financing instruments are available to fund the infrastructure projects that would benefit economic development in Gauteng. Recommendations include "smart financing" mechanisms that support revenue generation and densification; setting up an "infrastructure barometer" to develop a fine-grained, independent understanding of the city-region's network infrastructure systems, and a reform of the intergovernmental grant system to provide additional public funding for infrastructure development.

Embed the city-region concept in metropolitan transport and environmental policy

Metropolitan co-ordination is essential in the Gauteng city-region to ensure that sectoral policies are coherent, or at least not contradictory, in a functional metropolitan area that spills over multiple jurisdictions. Advancing the city-region vision will require: *i)* political commitment and consensus behind the notion of a metropolitan approach to policy; and *ii)* new forms of "light" co-operation, such as platforms, associations or strategic planning partnerships. Policy makers could target two critical areas:

- **Metropolitan transport:** co-ordinate all public transit fare systems in the city-region and use the Gautrain system as a platform to build co-operation in the city-region.
- **Environmental policy making and data collection:** encourage inter-municipal co-operation on waste collection and disposal, develop an intergovernmental approach to climate change action planning and strengthen regional co-operation on environmental data collection and management, particularly in assessing natural resource constraints and metabolic flows.

Strengthening participatory governance across the Gauteng city-region

Private sector and civil society groups are needed to tackle the challenges that the Gauteng city-region faces. Good governance depends on an active citizenry, which is essential for effective accountability. Citizen participation is encouraged in the integrated development plans (IDPs) and on the ward-based committees. The South African Government has recognised the shortcomings of these committees, and the Department of Co-operative Governance (DCOG) is refining guidelines to invigorate the ward system, which are to be issued in 2011. Given the large size of many wards, they are often not a viable forum for intensive democratic engagement. The following recommendations take such factors into account:

- Additional programmes could be developed to promote citizen engagement during upgrading activities given Gauteng's large housing deficits. This could enhance project feasibility and open channels for communication.
- Experiment with alternative instruments for engaging the public, such as participatory budgeting.

Chapter 1
A growing but polarised city-region

This chapter provides a profile of the Gauteng city-region's leading economic and demographic trends and offers an analytical framework for policy recommendations. The chapter begins with a definition of the city-region and then offers a critical assessment of its economic performance, innovation potential and environmental constraints. Considerable achievements in public service delivery and education are highlighted. The chapter also explores the legacy of apartheid spatial patterns on mobility, local economic development and land use patterns. The question of adequate housing receives particular attention, given its potential as a catalyst of economic development and a primary vehicle for socio-economic integration. Trends in population growth, provincial R&D expenditure, employment, patenting levels, air quality, poverty, household income distribution and transport access are reviewed. For a comparative analysis sensitive to the global nature of the economy, key indicators are benchmarked with the 90 OECD metro-regions of more than 1.5 million inhabitants that are included in the OECD Metropolitan Database.

Introduction

South Africa's economy has undergone radical changes since the fall of apartheid and the first democratic elections in April 1994. Growth performance has improved thanks to a better macroeconomic policy framework. Prudent fiscal, trade and monetary policy stabilisation programmes have normalised the economic and investment environment. As a result, the national economy has fared relatively well, with a healthy national budget and relatively low inflation and interest rates since 2000. Flows of foreign direct investment (FDI) have been instrumental in building up capital, increasing by almost tenfold (from USD 9.2 billion in 1990 to USD 87.8 billion in 2006) (OECD, 2009a). Productivity gains also explain consistent growth in South Africa; growth rates in labour productivity in the manufacturing sector more than doubled, from less than 2% per year between 1976 and 1980 to around 4.5% since 1986 (Aghion et al., 2008). Thanks to this strong economic performance, remarkable progress has been made in alleviating poverty and increasing personal income levels.

While growth has increased steadily both in real and per capita terms, South Africa's economy has not, however, performed as well as initially expected. Real gross domestic product (GDP) grew by 3.8% per year from 1995 to 2007, while GDP per capita increased by 1.2% during the same period.[1] Growth in GDP has consistently outpaced population growth since 1994. Real GDP grew by 56.4% between 1995 and 2007, while the total population grew by 18.7%. This resulted in GDP per capita growth during the same period of 31.8%. However, growth performance was not sufficient either to offer enough employment opportunities to absorb the young and growing population or to close the aggregate income gap with OECD member countries. Job creation and productivity growth have remained too low to underpin sustained and rapid growth in GDP per capita. Extreme and persistent low employment is complicated by other economic and social problems, such as inadequate education and poor health, which especially affect Black African youth. Finally, economic growth has not been equitably distributed throughout the population, and the per capita figures do not accurately reflect the well-being of the poorest segments of the population. While there has been some improvement in measured poverty over the post-apartheid period, inequality has worsened. With a 2004 Gini coefficient of 0.70, South Africa's inequality is more than double that of the OECD average (0.31) and is higher than the most unequal country in the OECD, Mexico (0.47).[2]

South Africa experienced a sharp deceleration of growth during the global economic crisis. GDP was more than 5% in 2007 but fell into negative territory, -1.8%, in 2009. In light of this downturn, relaxing constraints on economic growth would seem to be in order, while ensuring a wider distribution of growth yields. As highlighted in the *OECD Economic Survey of South Africa* (2010a), much effort should be made to expand the export-led sector, making better use of South Africa's resources to increase investment levels. South Africa has been moving towards a very unusual economic structure, in which the contribution of services is considerably higher than in emerging-market economies and arguably more resembles the structure of developed economies (Fedderke, 2010). Value-added in primary activities fell from 4.5% in 1990 to 3.2% in 2007 as a proportion of the total. Similarly, secondary activities' proportion of value added fell from 36.8% to 29% in the same period (OECD, 2009a). Services are becoming the core activity in South Africa. One important consequence is that job creation has shifted from unskilled labour-intensive agriculture and mining to relatively less unskilled

labour-intensive services and skill-intensive financial services. Too few manufacturing jobs have been created to compensate for the loss in the primary sector. Other important reasons for the failure to absorb labour in sufficient quantities include a declining share of output for tradables and weak export performance.

The effects of refining macroeconomic policy and implementing structural reforms to improve the functioning of labour markets will inevitably be felt in the Gauteng city-region, which contributes over one-third of national GDP and half of national exports. Encompassing a series of connected cities including the major metropolitan areas of Johannesburg, Tshwane and Ekurhuleni and many small and medium-sized towns, it has around 11 million inhabitants (roughly 22% of South Africa's total population) and several sectors that drive national economic growth, innovation and education. This has made the province a magnet for domestic and international migrants. Gauteng's exports, however, are heavily related to natural resources, and manufacturing exports remain a challenge. Gold and platinum mining remain economically important, along with energy, and iron and steel production. Advanced manufacturing is underdeveloped and the relative lack of university-linked technological innovation makes it difficult to move up the value chain. Second, deficiencies in the education system, patterns of spatial development and transport mobility have left inequality in Gauteng deeply entrenched. The richest centre, the city of Johannesburg, is itself considered the most unequal city in a global sample of 100 cities, with a Gini coefficient of 0.73 (UN-HABITAT, 2008). However, inequality is lower if measured at the Gauteng city-region level, standing at 0.64 in 2008 (Gauteng Provincial Government, 2010). Serious spatial and skill mismatches may hold back employment and growth. Finally, strong negative externalities of uncontrolled urbanisation, as well as an economic structure heavily based on resources extraction and fossil fuels, have compromised environmental quality in the city-region.

Keeping in mind the goal of a refined economic, environmental and governance strategy, this chapter provides a profile of the Gauteng city-region's leading trends and offers an analytical framework for future policy recommendations. After defining the city-region and critically assessing its economic performance, skills and innovation potential, as well as environmental constraints, the chapter reviews the inequalities that throw doubts on the sustainability of the current model. Next, the state of the formal and informal labour markets is discussed. Given the importance of apartheid spatial patterns, the spatial mismatch hypothesis is explored and put in historical context. Particular attention is paid to the state of housing, public service delivery, infrastructure and interconnectivity between the municipalities within the city-region. For a comparative analysis sensitive to the global nature of the economy, key indicators will be benchmarked with the 90 OECD metro-regions of more than 1.5 million inhabitants that are included in the *OECD Metropolitan Database*.

Throughout this Review, the argument is made that an a-spatial approach to the great challenges facing the Gauteng city-region is inappropriate. Gauteng's spatial pattern not only reinforces extreme inequalities, but also generates high economic and environmental costs. This underscores the arguments made in the "National Spatial Development Perspective 2006", a policy document that interpreted the spatial realities and implications for government intervention. The Review shares its argument that "[s]patial marginalisation from economic opportunities and social amenities continues to be a significant feature of the space economy and must be addressed in order to reduce poverty and inequality and to ensure shared growth" (Presidency of the Republic of South Africa, 2007).

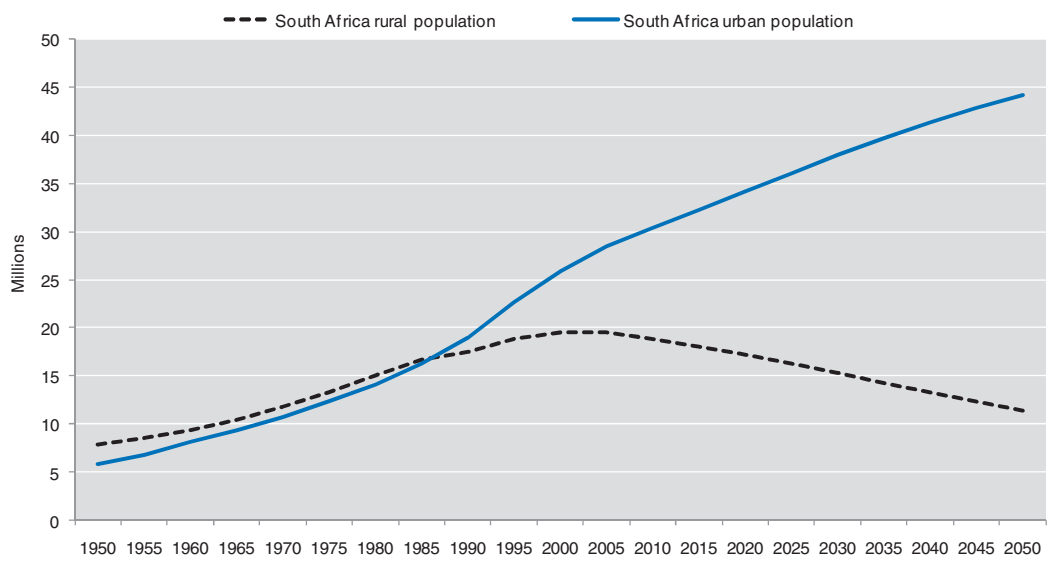
1.1. The demographic and historical context of the Gauteng city-region

The emergence of a mega city-region in an urbanising country

In a context of slowing population growth, South Africa has seen heavy migration to the cities. Its total population growth was elevated until the late 1970s, fuelled mainly by fertility rates at 5.65, more than double the OECD average (2.7 in 1970). Fertility rates decreased to 2.7 in 2006, and total population growth rates fell from 2.6% in 1994 to 0.6% in 2007 (OECD, 2009b). However, the urban population trends are somewhat different. Urban areas have been experiencing a net population gain at the expense of rural areas. The number of people located in urban settlements in South Africa has been growing over the past 60 years. In 2000, rural population numbers reached a peak, and have been waning since then. UN population data projections show that this process is likely to continue at least until 2050, while the rural population shrinks (Figure 1.1).

Figure 1.1. **Urban and rural population in South Africa**

Absolute population numbers



Source: OECD calculations based on data from the *UN Population Database* (2009).

Rather than an exclusively rural-to-urban migration, population trends show circular migration and the development of a rural-urban interface. Often, rural migration "first takes place to the nearest large town or city, or to a 'stand' along a major regional road to tap into the buying power of passing traffic and to gain a foothold in the urban, more cash-based economy, while still retaining a link to a rural economy" (Presidency of South Africa, 2007). Subsequently, migrants may plan moves to larger cities. If successful, they may acquire employment and transfer remittances to their kin in rural areas. In less successful cases, they leave for a city and return home dependent on the care of family members (Box 1.1).

Box 1.1. **"Tenuous urbanisation" and rural-urban linkages**

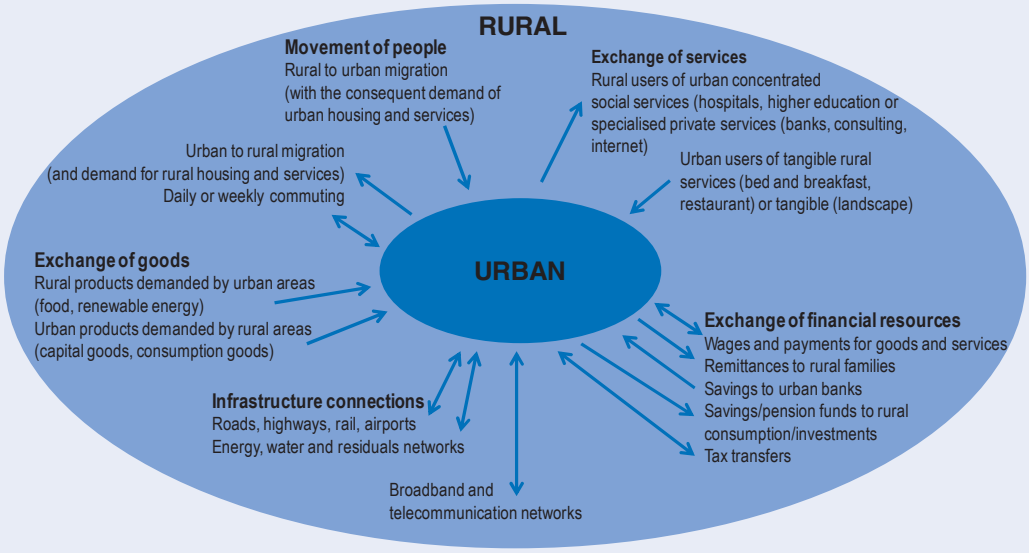
Rural and urban areas tend to develop along a continuum, interacting in spaces as well as in functions. Rural areas in close proximity to urban areas can provide easy access for nearby urban residents to environmental and recreational goods. On the other hand, in many countries, a large part of the rural territory is within easy reach of urban workers, who commute daily to work from a rural residence. These flows of people between rural and urban areas are just one component of a more complex set of functional interactions. Other relevant forms of linkages are exchanges in commodities (and other industrial linkages generated by inter-linkages between sectors, i.e. urban processing of rural raw materials), financial flows, shared or competitive use of amenities, environmental goods (land, water) and public services. Statistics South Africa (2006) suggests that "dynamic ties … keep the rural areas linked to the cities, both the former homeland areas and formal agricultural areas. … The ties between urban dwellers and the rural population may ensure the sustained existence of rural settlements, despite poverty and out-migration".

Trends in household behaviour in Gauteng show signs of "tenuous urbanisation" (City of Johannesburg, 2006). One such sign is the significant number of locked but unoccupied shacks in informal settlements surveyed across Gauteng in 2005. The City suggests that the locked structures may belong to circular migrants, who for the most part live in one or other rural area, or to families that have other accommodation in backyard dwellings or inner-city flats. Both groups may be trying to hedge their bets by keeping a structure in an informal settlement in case other options fail. The phenomenon is not insignificant. Up to 30% of the structures in Johannesburg's informal settlements appear to have no households resident on a full-time basis (City of Johannesburg, 2006, cited in Charlton, 2010).

The question of Gauteng's position in a rural-urban continuum has not been adequately researched in South Africa. Additional research is merited, especially on the question of the linkages between rural evictions and the growth of the Gauteng city-region. Indeed, one report found that some 2.4 million people were displaced from farms between 1994 and the end of 2004, of whom 942 303 were evicted. These numbers were higher than in the 1984-93 period, when 737 114 Black Africans were evicted from farms, and a total of 1.8 million were displaced (Social Surveys and Nkuzi Development Association, 2005). Other research indicates a declining number of farm units, an increase in the size of farms, and an amalgamation of plots into private game reserves and game farms, which may contribute to metropolitan concentration (Mabin, 2011).

Movement between urban and rural populations includes rural-to-urban migration, urban-to-rural migration and commuting. Service delivery is an important consideration in discussions of the inter-connectedness of rural and urban areas. It includes the exchange of services (rural users of services and public goods concentrated in urban areas, and urban users of services and public goods in rural areas), the exchange of goods (rural products demanded in urban areas and urban products demanded in rural areas), the exchange of financial resources (wages and payments for exchange of goods and services, remittances and savings/pension funds sent to rural areas, rural savings in urban banks and tax transfers), and the infrastructure that connects rural and urban areas (roads, highways, rail, airports, energy, water, broadband and telecommunication connections, etc.) (see figure below). Public service delivery strategies must take better account of the cascading effects of policy decisions that link rural and urban regions (OECD, 2010). People, food, energy, water, landscape and biodiversity are only a few of the assets rural areas can use to compete in national and international markets and rebalance the urban-rural relationship. Further study of these elements within the context of South Africa would be useful.

Box 1.1. **"Tenuous urbanisation" and rural-urban linkages** *(cont'd)*

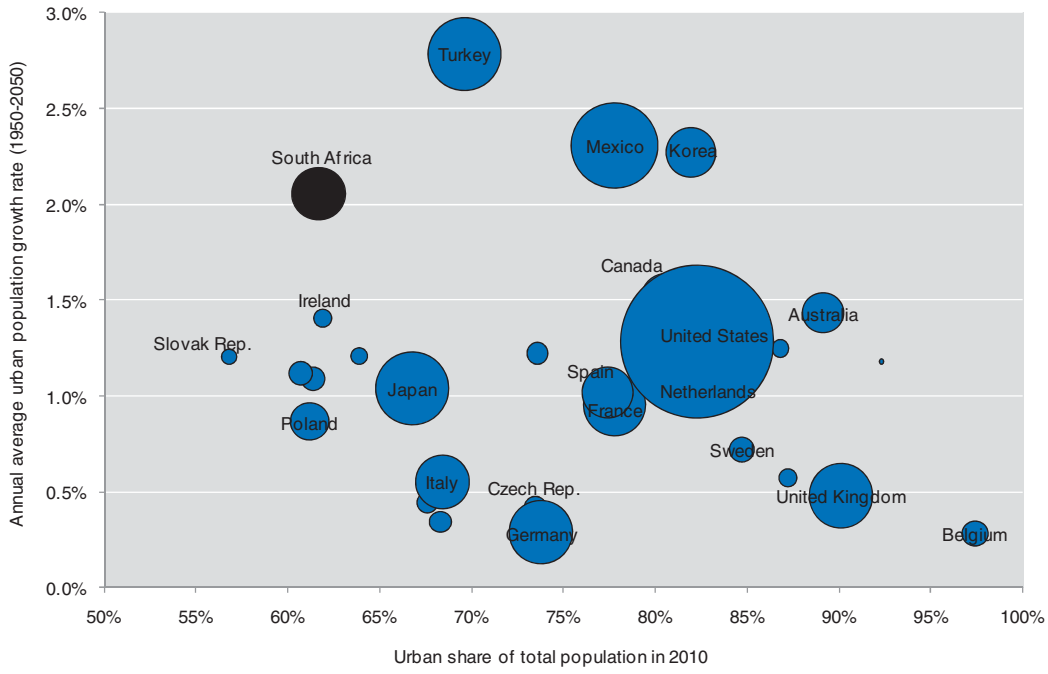


Sources: Charlton, S. (2010), "Inclusion Through Housing: Limitations and Alternatives in Johannesburg", *Urban Forum*, 21(1): 1-19; City of Johannesburg (2006), *Growth and Development Strategy,* City of Johannesburg; Mabin, A. (2011), "Transformation of the Land Question? A Reflection on 'Preparing to Negotiate the Land Question' 21 Years Later", *Transformation* 75; OECD (2010), *OECD Rural Policy Reviews: Strategies to Improve Rural Service Delivery*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264083967-en*; Social Surveys and Nkuzi Development Association (2005), *Still Searching for Security: The Reality of Farm Dweller Evictions in South Africa*, Johannesburg, *http://nkuzi.org.za/images/stories/evictions_Survey.pdf*; Statistics South Africa (2006), "Migration and Urbanisation in South Africa", Report no. 03-04-02, Statistics South Africa, Pretoria, *www.statssa.gov.za/publications/Report-03-04-02/Report-03-04-02.pdf.*

It is projected that by 2030, rural areas in South Africa will lose 5 million people. In other words, compared to 2000, forecasts indicate that South Africa's rural population will be halved by 2050.[3] Conversely, urban dwellers will steadily increase and population in urban centres will almost double by 2050. If UN datasets and forecasts are taken into account, urban population growth between 1950 and 2050 in South Africa is projected to be similar to the high-population-growth countries in the OECD, such as Mexico, Korea or Turkey (Figure 1.2). Growth rates for the urban population are thus projected to be four times higher than the rates for total population growth has been in recent years.

Figure 1.2. **Trends in urbanisation by OECD country and South Africa**

Urban population and growth (1950-2050)

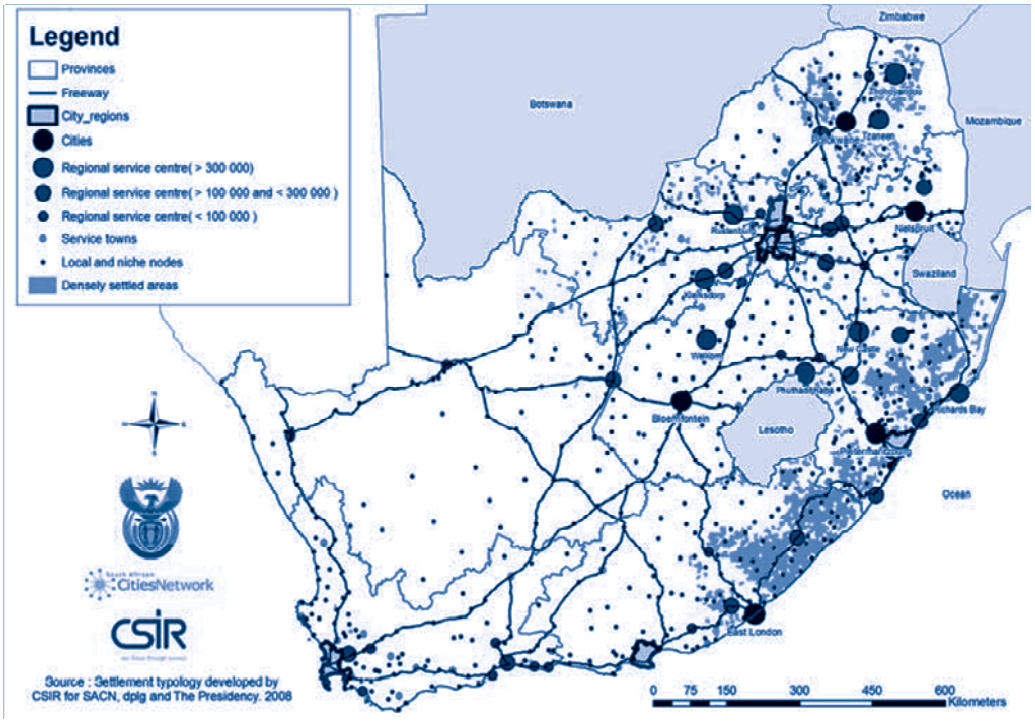


Note: Bubble size represents population forecast to 2050 according to the *UN Population Database*.

Source: OECD calculations based on *UN Population Database* (2009).

South Africa's functional urban areas have yet to be satisfactorily defined. Among the limiting factors are the lack of a methodology and the paucity of relevant data. Dense (and often large) settlements were created in rural areas through processes of resettlement from African freehold land and displacement from commercial farms in areas defined for white occupation. The 2003 National Spatial Development Perspective admitted that "[o]ne of the key insights of the NSDP is that the categories 'urban' and 'rural' as used in South Africa have little meaning." The Municipal Demarcation Board (MDB) has identified eight metropolitan municipalities in South Africa, namely those of Johannesburg, eThekwini (Durban), Cape Town, Tshwane, Ekurhukeni, Nelson Mandela Bay , and, introduced in 2011, Mangaung and Buffalo City. The eight metropolitan municipalities in South Africa are part of what has been identified as the country's functional urban areas (Figure 1.3). According to the "National Spatial Development Perspective 2006", these 26 functional urban areas produce 96% of the total national gross value added (GVA). Nevertheless, these functional areas are defined according to criteria that are often subjective or qualitative, which differs from the OECD's definition, which is based on density and commuting areas (Box 1.2).

Figure 1.3. **South African urban structure**



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: CSIR, Built Environment and EconRise (2008),"A National Overview of Spatial Trends and Settlement Characteristics", South African Cities Network (SACN),the Department of Provincial and Local Government (DPLG), and the Presidency, *http://stepsa.org/resources/shared-documents/summary-overview-national-spatial-trends-jan09-pdf*.

Box 1.2. **The demarcation of metropolitan municipalities in South Africa**

The Municipal Demarcation Board (MDB) has been required by the Local Government Municipal Demarcation Act No. 27. of 1998 to determine all municipal boundaries throughout South Africa, among other responsibilities. This act determines that an area must be declared a metropolitan area (which grants it exclusive authority for executive and legislative purposes) in the case that area is:

- a conurbation featuring: *i)* areas of high population density; *ii)* an intense movement of people, goods and services; *iii)* extensive development; and *iv)* multiple business districts and industrial areas;
- a centre of economic activity with a complex and diverse economy;
- a single area for which integrated development planning is desirable; and
- having strong interdependent social and economic linkages among its units.

Source: Cameron, R. (2006), "Local Government Boundary Reorganisation", in U. Pillay, R. Tomlinson and J. du Toit (eds.), *Democracy and Delivery: Urban Policy in South Africa*, HRSC Press, Tshwane, South Africa.

Although defining the extent and limits of the Gauteng city-region is not an easy task, it is possible to say, from several sources including the OECD methodology based on commuting data and density, that the functional city-region is largely coterminous with the administrative borders of the Gauteng Province. The Gauteng Province, which is the most densely populated province in South Africa, is characterised by a series of connected cities, such as Johannesburg and Tshwane and small towns functioning as a single, integrated urban region (Box 1.3 and Figure 1.4). Nevertheless, the OECD methodology is limited in excluding wider economic linkages that transcend labour force commuting. Some linkages are self-evident – the oil from coal produced at Sasolburg is primarily exported north to Gauteng rather than south to the provincial capital, Bloemfontein. Rustenburg is a fast-growing population centre close to Gauteng, with regular transport and economic links. The Mpumalanga mines and power stations (fired by nearby coal mines) export primarily to Gauteng. Moreover, the demarcation of Gauteng Province sliced off all areas to the north of Tshwane. Many of these dense populations are in former homelands or "*bantustans*" established under apartheid to corral black citizens in economically unviable areas. This forced the black residents to migrate to cities to sell their labour, although they had no residential rights in those cities. Many are more closely linked to the Gauteng city-region, to which they commute daily, than to outlying towns nearer to their homes.[4] Finally, the OECD methodology does not employ satellite imagery, which has been used to show the urban structure and land-cover in Gauteng (Figure 1.5).[5]"

Box 1.3. **Defining the Gauteng city-region**

The OECD has been using a definition of a metropolitan region that tried to capture functional economic areas based on large building blocks, such as TL3 regions.[1] However, where possible, the OECD definition has been applied to cities using small building blocks. In this regard, municipalities have been selected as territorial units of analysis. In order to define the metropolitan areas among OECD member and non-member countries, the OECD has established a multi-criteria approach that involves two main steps: *i)* the definition of a core area, based on the population density of small building blocks; *ii)* the identification of a grouping of contiguous small building blocks that capture the area with significant commuting to the core (OECD, 2009).

i) Regarding the definition of the core area, a density threshold has not been set up, due to the high-density differentials across the country. The city of Johannesburg has been considered as the core area, since it is the municipality with the highest population density in the country. In 2009, the City of Johannesburg Metropolitan Municipality registered a density of 2 362 inhabitants per square kilometre, which is far higher than the average at national level (91 inhabitants per square kilometre) as well as the average for the Province of Gauteng (507 inhabitants per square kilometre). In the Province of Gauteng, only the Ekurhuleni Metropolitan Municipality, the City of Tshwane Metropolitan Municipality, as well as the Emfuleni Local Municipality (1 427, 1 082 and 680 inhabitants per square kilometre respectively) have a density higher than the provincial average.

Box 1.3. **Defining the Gauteng city-region** *(cont'd)*

ii) A self-contained labour market area is defined as a zone in which the bulk of the resident population also works. Commuting data from the *Gauteng Travel Survey* (2004) were used in order to identify the group of municipalities that should be added to the functional area. A commuting rate was calculated computing the ratio between employment at the place of work and employment at the place of residence. A threshold of self-containment has been established at 10%. Thus, if the commuting rate of the core region identified in the previous steps is below the fixed threshold, it is considered to be self-contained. Conversely, if the commuting rate is above the threshold, then the metropolitan area has significant labour force exchanges with other regions. The aggregation of neighbouring regions has been continued until the threshold of self-containment is achieved.

According to the OECD definition of a metropolitan area, the proposed boundaries of the Gauteng city-region include almost the whole of Gauteng Province. The municipality of Randfontein is not included as part of the functional area, possibly because the analysis of this territory was missing some values. Moreover, and following the methodology proposed by the OECD (2009), the functional area should include areas surrounded by municipalities which are part of the functional system and thus, Randfontein should be included as part of the functional area (Figure 1.4).

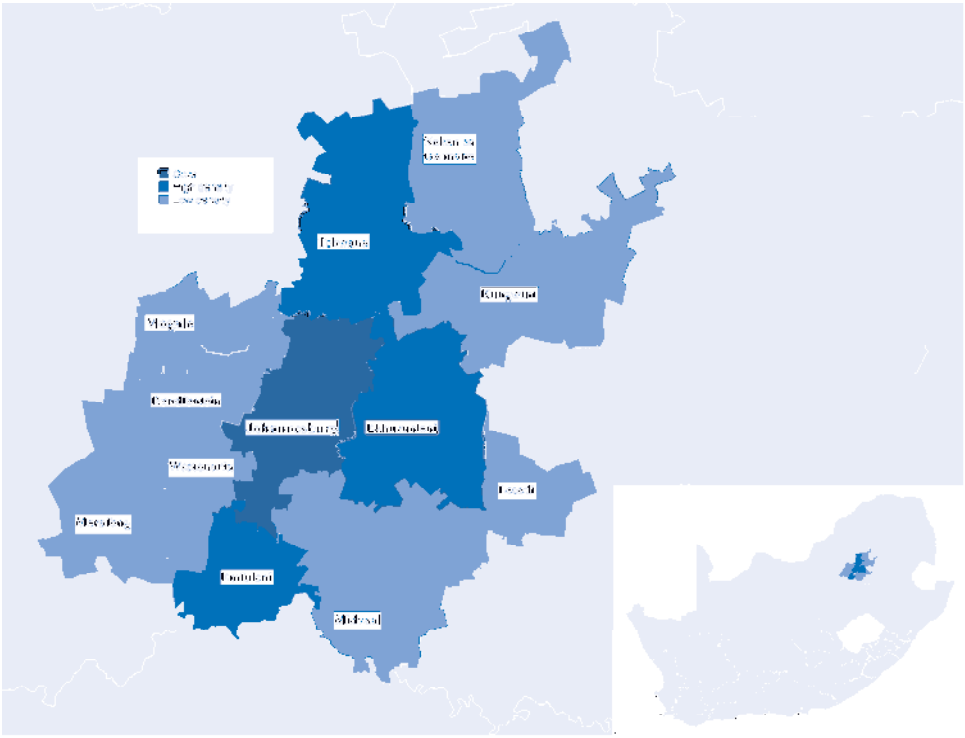
Overall, the most significant flows across the province are into the centres of Johannesburg and Tshwane and between the centres of Johannesburg, Tshwane and Ekurhuleni. Another key yet smaller flow is into Johannesburg from various points on the West Rand, most notably from Krugersdorp and surrounding areas in Mogale City, and to a lesser extent from Randfontein, Westonaria and Merafong City.[2] There are also increasing flows of freight and commuter traffic between the core cities in Gauteng and outlying cities such as Rustenburg, which is growing rapidly as one of the world's most important sources of platinum group metals. The commuting is contained within the Gauteng Province: only 1% of all trips in the area originated from or ended in zones outside the province (Gauteng Department of Roads and Transport, 2006).

1. There are other commuting dynamics at play. While there is a noticeable flow from the cluster of nodes historically known as the Vaal Triangle – Vereeniging, Vanderbijlpark and Sasolburg – towards Johannesburg, the internal connections in this area are more significant. Particularly noticeable is the commuting from the Vaal townships of Sharpeville and Sebokeng into the industrial areas of Vereeniging and Vanderbijlpark. There is also commuting into the core from outlying parts of the province, and also from across the provincial boundary, but these connections are far less significant than those in and between the central areas of Gauteng.

2. The classification is based on two territorial levels. The higher level (territorial level 2 – TL2) consists of 335 large regions, while the lower level (territorial level 3 – TL3) is composed of 1 681 small regions. All the regions are defined within national borders and in most the cases correspond to administrative regions. Each TL3 region is contained within a TL2 region (except in Germany and the United States) (OECD, 2009).

Sources: Gauteng Department of Roads and Transport (2006), *Gauteng Transport Study 2000*, Gauteng Provincial Government, Johannesburg; OECD (2009), *Regions at a Glance 2009*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/reg_glance-2009-en*.

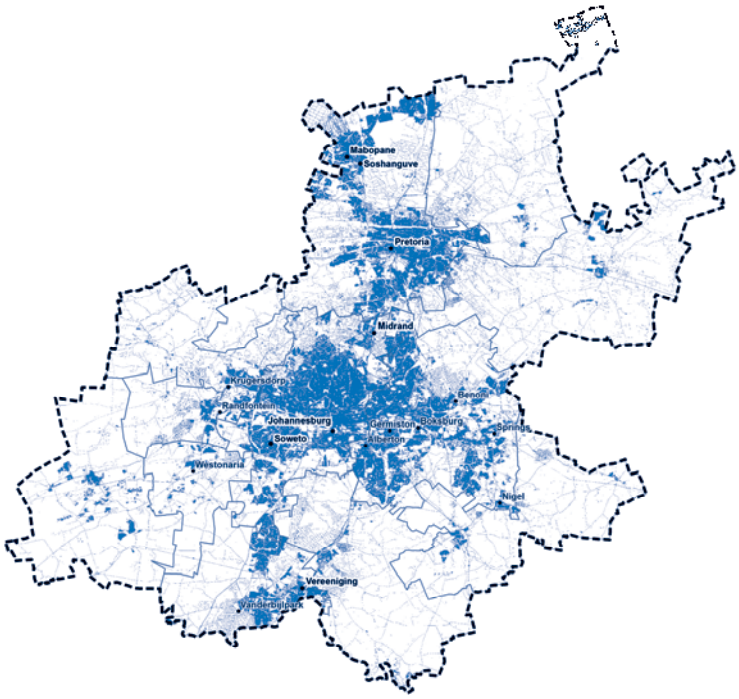
Figure 1.4. **Population density in the Gauteng city-region**



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD based on Quantec data.[6]

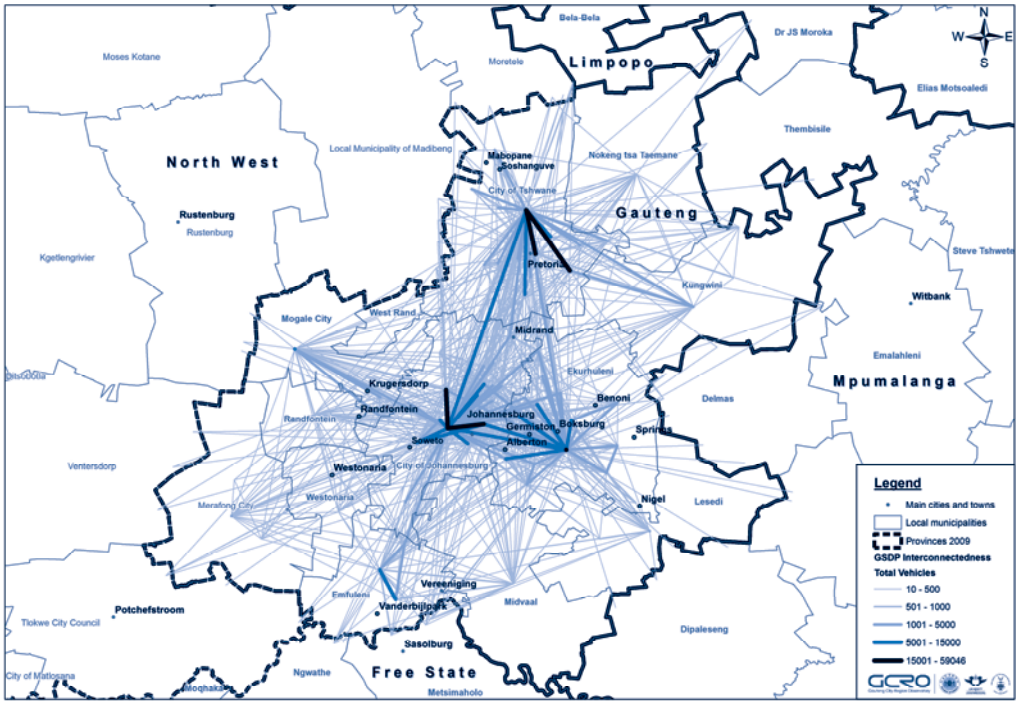
Figure 1.5. **Urban land-cover in the Gauteng city-region**



Source: Gauteng Provincial Landcover (10m) © GeoTerraImage – 2009.

Gauteng accommodates an intense flow of intra-metropolitan commuting. This creates a complex multi-nodal structure in which neither of the two major centres, Johannesburg or Tshwane, dominate or have their own self-contained labour market. There are three major foci in Gauteng: *i)* the central area of Johannesburg, including the old Johannesburg Central Business District (CBD) and the area in and around the new edge-city central business district of Sandton; *ii)* the Pretoria city centre in the municipality of Tshwane; and *iii)* a cluster of nodes in the municipality of Ekurhuleni – Germiston, Kempton Park, Alberton, Boksburg and Benoni – roughly centred on Oliver Tambo International Airport, which receive flows from smaller nodes such as Springs and Nigel and the major townships of Katlehong, Thokoza and Vosloorus (Figure 1.6).

Figure 1.6. **Home-to-work commuting in Gauteng**



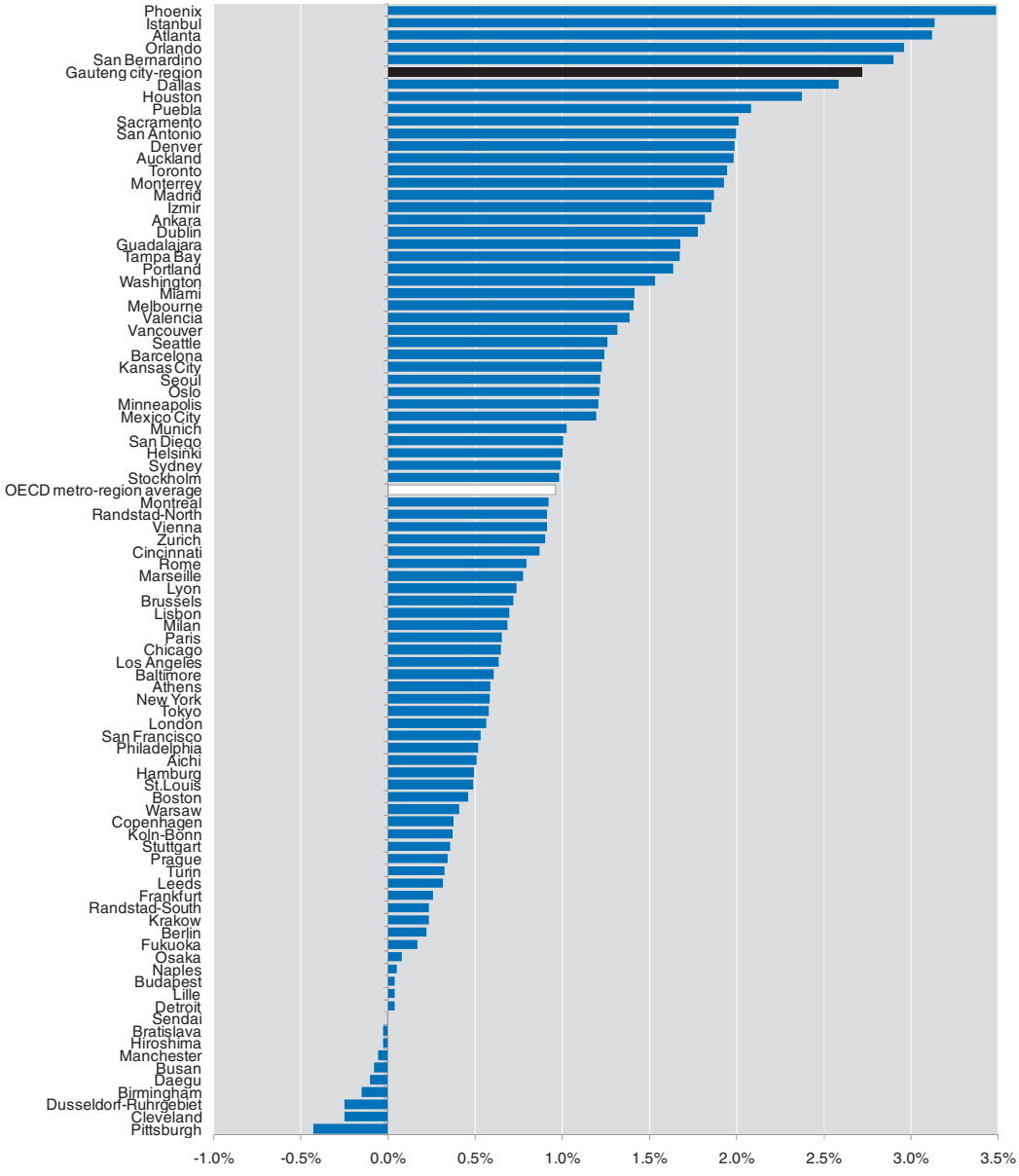
Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map. The Gauteng city-region has recently seen a new demarcation of some municipal boundaries for the local government elections in May 2011. With these boundary changes, the District Municipality of Metsweding, and its local municipalities of Kungwini and Nokeng tsa Taemane, ceased to exist, and its area was incorporated largely into Tshwane, with a small portion merged into Ekurhuleni. Since the bulk of the data collection for this Review occurred during 2010, the analysis here refers to the separate municipalities that existed at the time.

Source: Gauteng City-Region Observatory (2010), "Background Report for OECD Gauteng Territorial Review", 25 October version, based on source data from the *Gauteng Spatial Development Perspective 2007*.[7]

With a population of about 11 million inhabitants (22% of the total population of the country), Gauteng has been one of the fastest-growing city-regions in South Africa and has consistently absorbed the highest numbers of domestic migrants. The population has been growing rapidly, faster than that of the country as a whole increasing by 3.2 million between 1995 and 2009, i.e. 2.6% annually *vs*. 0.6% at the national level. As compared to the 90 OECD metro-regions, the Gauteng city-region features as having one of the most

dynamic population growth rates: more than 2.7% per year between 1997 and 2007, against 0.96% for the OECD average (Figure 1.7). This population increase is due largely to the high level of in-migration. This is not a new phenomenon; Gauteng has always been an area of heavy in-migration.[8] Official estimates suggest that the population increased by 13.6% between 2001 and 2007, and this is surely an underestimate. In 2007, the *Community Survey* found that only 58% of Gauteng residents were born in the province (Statistics South Africa, 2008). Gauteng received the most migrants in South Africa, followed by the Western Cape.[9]

Figure 1.7. **Average annual population growth rate in OECD metro regions and in the Gauteng city-region, 1997-2007**



Note: Data period varies depending of the location of the metropolitan region. Belgium, Germany, Netherlands, Poland (2000-07); Denmark (2006-07); Turkey (1997-2006).

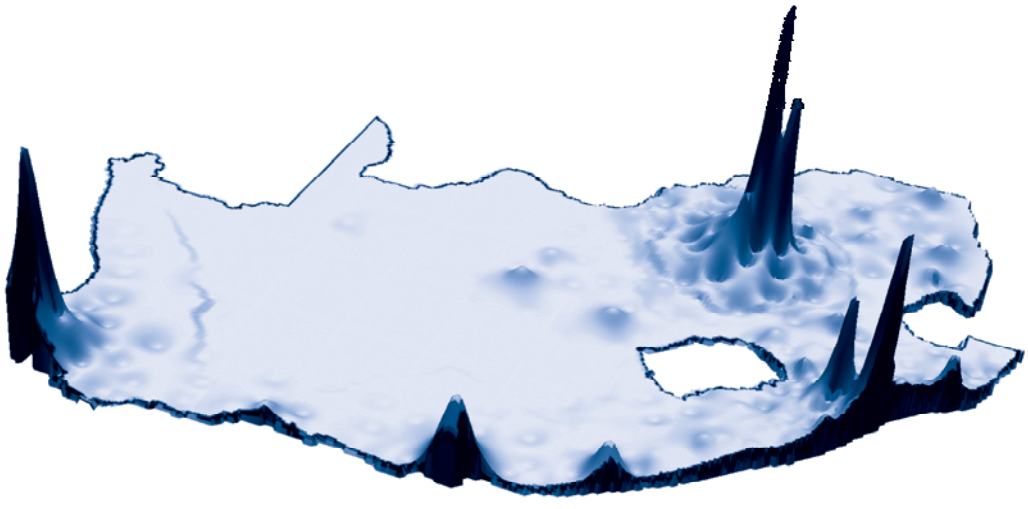
Source: *OECD Metropolitan Database* (2010).

As Gauteng's economy has grown, it has attracted the greatest number of foreigners in South Africa. Data in this area are notoriously weak and unreliable, and the figures given here should be regarded as indicative at best. The 2007 *Community Survey* found that Gauteng included 578 387 migrants born outside South Africa, although information on their countries of origin is not available from the released findings. Across South Africa, the survey found 1 268 324 non-South African migrants, indicating that Gauteng is the home of nearly half (45.6%) of migrants from outside the country's borders. Gauteng is a major attractor for international migrants, especially from the African continent, and increasingly from Pakistan, Bangladesh and China. Though a skills profile of immigrants has not been undertaken, anecdotal evidence suggests that a range of skills and talents are offered to Gauteng's economy by immigrants. The picture of a city of heavy in-migration – even if for many it is only a "transit station" – is likely to be an important, and perhaps the most important, factor influencing how Gauteng is perceived as an international location for business and development.[10]

Urbanisation trends in South Africa and in Gauteng have also been accompanied by increasing concentration in a few locations (Figure 1.8). A handful of very dense urban areas in South Africa are increasingly accounting for a greater share of population. For instance, the Johannesburg Metropolitan Municipality accounted in 2009 for the highest density in South Africa, with 2 362 inhabitants per square kilometre, followed by eThekwini (1 547 inhabitants per square kilometre). The Cape Town Metropolitan Municipality is the third city in terms of density, followed by the cities of Tshwane and Ekurhuleni – both in Gauteng, and both with a density higher than 1 000 inhabitants per square kilometre. Within the Gauteng city-region, population growth is concentrated in only a few municipalities. The city-region includes three municipalities with very large populations, and ranges from the tiny West Rand District Management Area, which accounts for only 0.03% of the city-region's population, to Johannesburg, which includes more than one-third. Across municipalities growth rates ranged widely. While Johannesburg and Kungwini grew annually by 3.1%, Westonaria grew annually by only 0.2% and Merafong and Lesedi by 0.8%.

Figure 1.8. **Population density in South Africa, 2009**

Population per square kilometre



Source: OECD calculations based on Quantec data.

An urban form shaped by history

The Gauteng city-region has considerable spatial challenges, some inherited from apartheid and some amplified by current trends supporting urban sprawl. Under apartheid laws, a highly unequal and fragmented urban form was created, and efforts over several decades to build a more spatially integrated metropolis have been frustrated. Urban sprawl and a discontinuous urban form with interspersed brownfields and unbuildable land prevail. Today, the poorer African townships are still located far from centres of economic opportunity and urban amenities.

The policies of apartheid distorted property markets, instituting an inefficient spatial structure with high density levels in the periphery and low overall levels of density. The apartheid policy of locating Africans in decentralised dormitory "townships" extended Gauteng's urban form farther than if the cities' property markets had functioned normally and workers had been permitted to cluster closer to nodes of employment. A series of laws encouraged the growth of residential areas of two types: those exclusively owned by whites and those inhabited by the victims of apartheid (Mabin, 2007). "Grand apartheid", intent on separating the races on a large scale by forcing them to live in separate places defined by race, removed many black South Africans from cities and sent them to largely rural homelands (*bantustans*). Within the Gauteng city-region, this ultimately created a discontinuous urban pattern and an expanded urban footprint. These measures created unusual settlement patterns, in the form of high-density clusters on the Gauteng city-region's northern edge. In the *bantustan* of Bophuthatswana and the homeland of KwaNdebele, around Tshwane, an array of discontinuous and disconnected "villages" was laid out. Many of these were on an initial urban grid pattern, without transit connections, which then bled off into more rural forms with small agricultural plots.

Though the Gauteng city-region is known for the corridor connecting Johannesburg and Tshwane, it is a polycentric metropolis, as distinct from the classic land use model of monocentric development documented in urban economics. Its polycentric structure was initially due to the discoveries of gold along a broad axis running east and west known as the Witwatersrand[11] reef, which spread mining and, later manufacturing, outside Johannesburg. The growth of coal-mining in the east, and the emergence of smaller industrial centres such as Vereeniging-Vanderbijlpark, Sasolburg, Benoni and Nigel, all of which in one way or another connect into mining-supply chains, led to a metropolitan region with a polycentric spatial structure. Germiston, located directly to the southeast of Johannesburg, emerged as the largest railway junction of South Africa, further reinforcing a multi-polar model.

Mono-functional zoning laws enacted during apartheid exacerbated urban sprawl and excessive commuting times. Historically, African townships had no commercial zoning, since the Native Urban Areas Act was intended to ensure that the Black African population funded its own urban development through municipal monopolies on retail and brewing. A series of zoning laws enacted during apartheid instituted a division between commercial, residential and office areas throughout Gauteng that was originally stipulated in mono-functional zoning regulations from the 1930s. Only in the 1980s did city authorities begin to encourage mixed-use zoning. These laws in essence helped create a polycentric cluster of commercial property nodes, a number of which are recognisable as city-centres in their own right, separated by a virtually continuous low-density sprawl, and interspersed with patches of high-density mono-functional townships into which poor, ethnically identified populations were forcibly moved. By preventing mixed-use

zoning, the apartheid reforms resulted in higher commuting times in areas without sufficient public transit.

Strict apartheid control measures prevented non-whites from entering cities and created a legacy of massive under-investment in public transport and higher commuting costs for the poor. Laws such as the Group Areas Act of 1950 and the Population Registration Act of 1950 introduced strict "influx control" measures that prevented people from entering the city unless they had a pass.[12] The scant public transport to non-white areas isolated a large part of the population and reduced mobility. A fairly comprehensive passenger rail network was introduced to transport African workers to their places of employment during apartheid, but the province's passenger rail network, along with the national rail-freight network, began to decline in the 1970s. Without adequate public transport, the population in non-white areas shifted to minibus taxis. In 1975, 50% of lower income commuters used rail to get to work, and only 5% used taxis, but by the early 2000s, this split had been reversed: only 15% of lower income commuters used rail, and 53% used taxis.[13] The taxi industry was "one of the largest privately owned public transport systems in the world" (City of Johannesburg, 2006b). The consequent lack of a unified fare system and the higher costs of privatised public transit raised the commuting costs for the inhabitants of poorer neighbourhoods (see discussion on transport below).

Apartheid's suppression of township economies left a legacy of job-poor, capital-deprived neighbourhoods. Townships were deliberately configured without, or with little space for, economic activity. Master planning and "spatial engineering" under apartheid stripped non-white areas of their financial capital, denying them the right to live in central areas and to own businesses and property. Infrastructure, especially the provision of electricity, was also deliberately limited in the townships. At the same time, strict control on the inflow of "African" and "coloured" people was enforced, linked to a series of legal and financial instruments that, in practical terms, suppressed the economic development of townships by obliging non-white communities to shop in white central business district (CBD) areas.

Gauteng's low-density, polycentric form is further complicated by mine-dumps that have hindered post-apartheid spatial integration. Strips of mining land polluted by industrial cyanide and other chemicals historically used to extract gold from ore-bearing rock have limited expansion and/or redevelopment. Spatially, these brownfields have created a dividing line between the wealthier northern part of the city-region and the poorer south, where townships such as Soweto and large informal settlements such as Orange Farm are located. In the eastern municipality of Ekurhuleni, old coal mining reaches have also limited spatial reintegration of the city-region.

1.2. Socio-economic and environmental trends in the Gauteng city-region

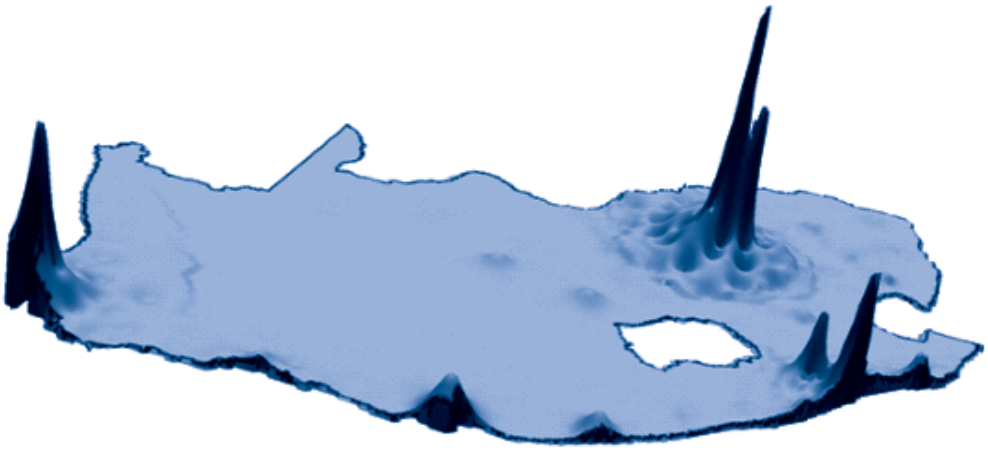
Gauteng: a driver of national growth constrained by subpar productivity levels

Gauteng is not only the most urbanised but also the wealthiest province in South Africa. Spatial lumpiness is characteristic of economic activity in South Africa (Figure 1.9). Economic concentration in the Gauteng city-region is disproportionate to its population size. This trend is common in OECD member countries where urbanisation and economic concentration are generally associated with higher income and productivity levels (OECD, 2006). Generally, agglomeration economies in large urban centres result

in higher productivity that allows firms to pay higher wages, in turn attracting yet more workers and producing a centripetal effect. In South Africa, the Gauteng Province had the highest per capita GVA (ZAR 67 000) in 2008, followed by Western Cape (ZAR 57 000), while the national average stood at ZAR 42 000. With relatively higher GVA figures, Gauteng Province has the largest share of national GDP (33.9%) far ahead of the next in line, KwaZulu-Natal, which includes the metropolitan area of eThekwini, around Durban (Figure 1.10). When compared to the other 90 OECD metro-regions, Gauteng ranks 14th in terms of its contribution to national GDP (Figure 1.11). Gauteng's economic importance for South Africa is similar to Auckland's to New Zealand and is even larger than that of Tokyo, London and Paris in their respective countries. The Gauteng city-region's GDP per capita is comparable to that of Mexico City and Istanbul, but the South African national average is more than a third lower than the national averages of Turkey and Mexico.

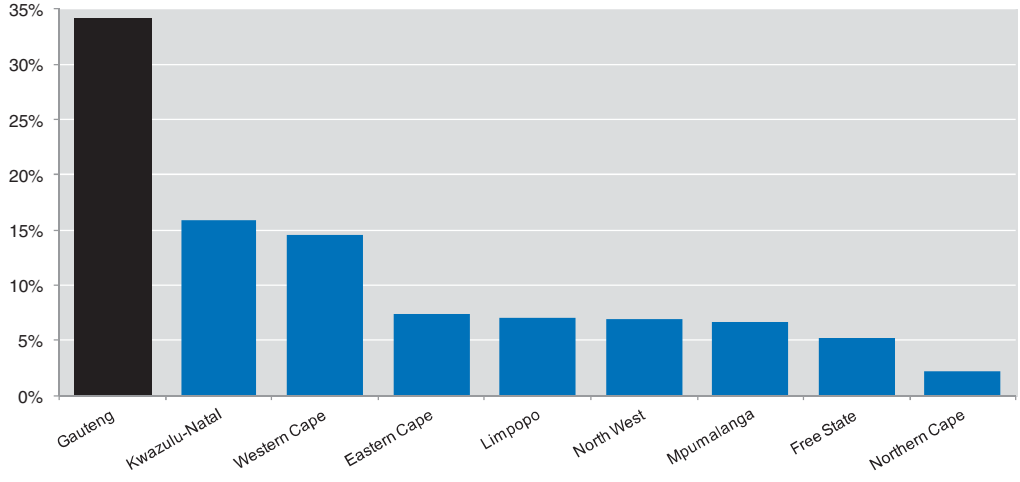
Figure 1.9. **Economic density in South Africa, 2008**

GVA per square kilometre



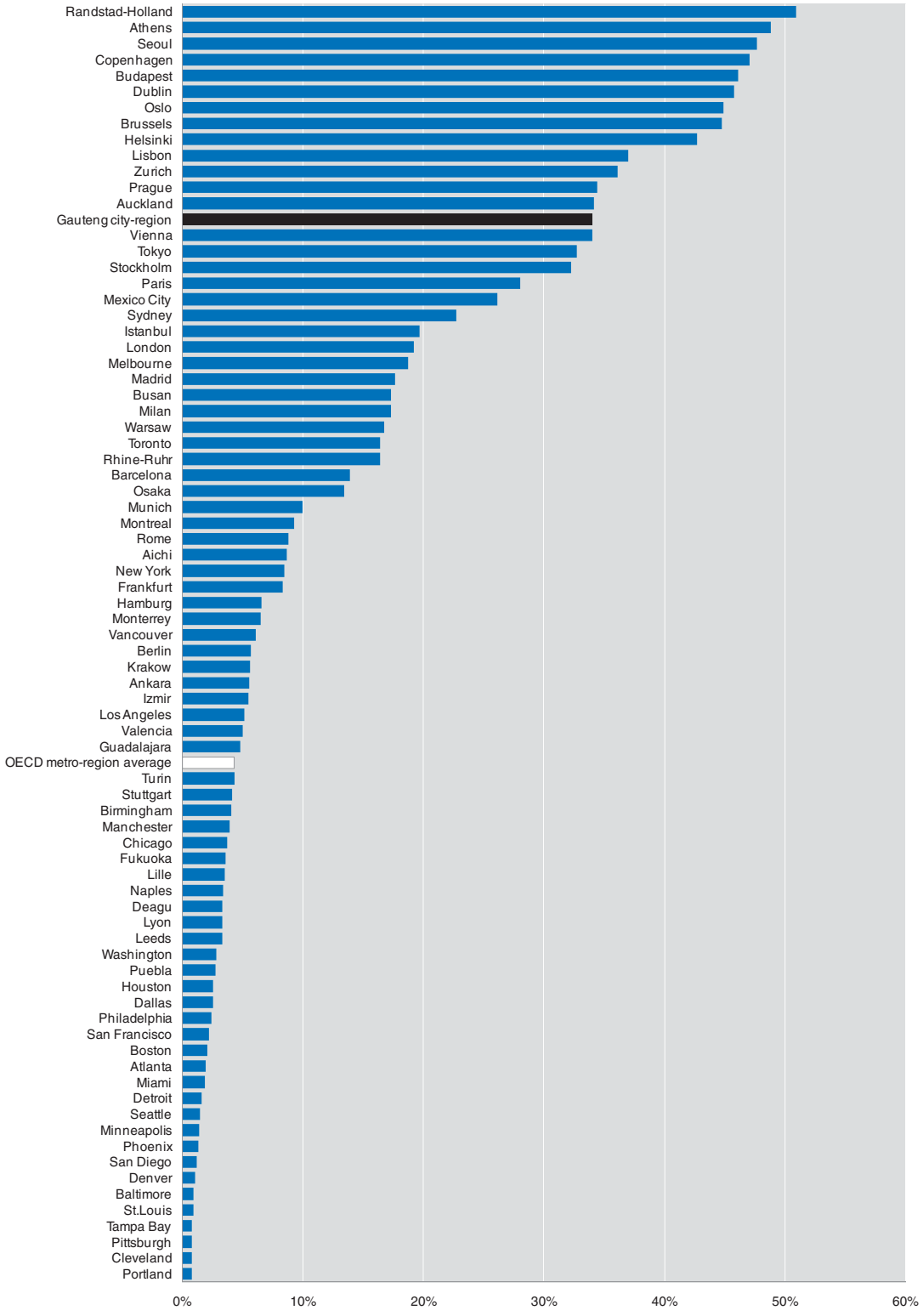
Source: OECD calculations based on data from Quantec.

Figure 1.10. **Provincial share of national GDP, 2008**



Source: OECD calculations based on data from Quantec.

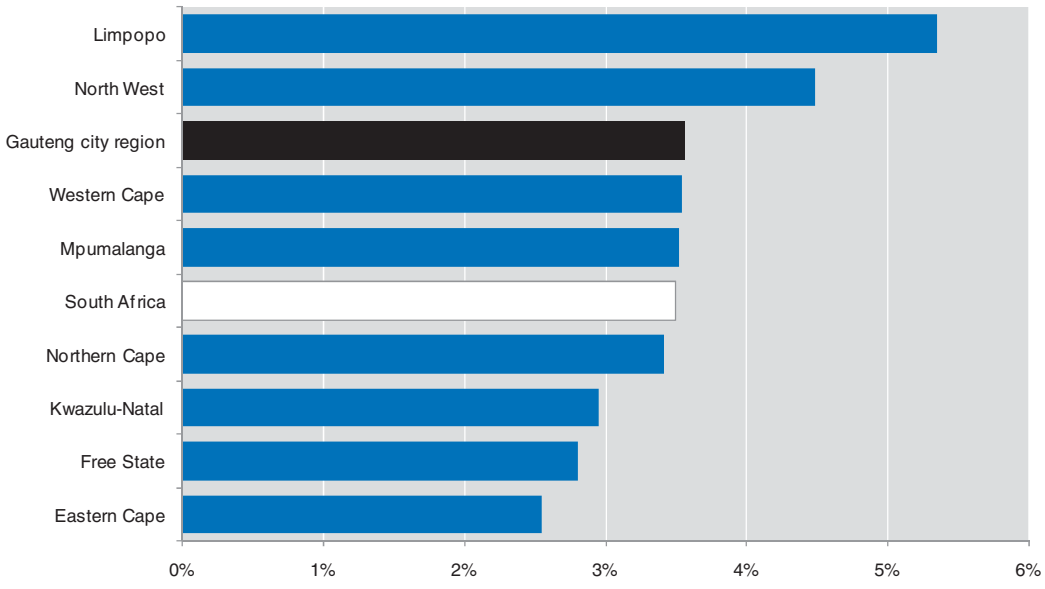
Figure 1.11. **Metropolitan GDP as a share of national economy, 2007**



Source: *OECD Metropolitan Database* (2010).

Gauteng is South Africa's engine of growth. Many OECD metro-regions are drivers of national growth, and often national rates and those for the metro-regions are similar. The Gauteng city-region is no exception. Its GDP grew at an annual average rate of 3.6% over the 1995-2008 period, with growth in some years, such as 2006 and 2007, exceeding 6%. The 1995-2008 average of 3.6% is slightly above the national average of 3.5% (Figure 1.12). The province contributed more than one-third of national economic growth between 1995 and 2008. Gauteng's contribution to national growth exceeds its population share. In terms of a ratio between a province's contribution to national growth and its share of national population, Gauteng comes in first in the country (Figure 1.13), at 1.6. This means that for every 1% of the province's population share, 1.6% is added to its contribution to national growth. Agglomeration economies, such as linkages among suppliers and buyers, the pooled labour market and knowledge spill-overs, probably make Gauteng's residents more productive than other South Africans. However, it is possible that productive linkages with other provinces have made growth possible in Gauteng. At the same time, Gauteng's performance is dependent not only on productivity but on a growing labour market. Between 1995 and 2008, productivity continued to drive GDP per capita in the province, but its contribution to performance declined, while its contribution to expansion in the labour force increased (see Figure 1.17).

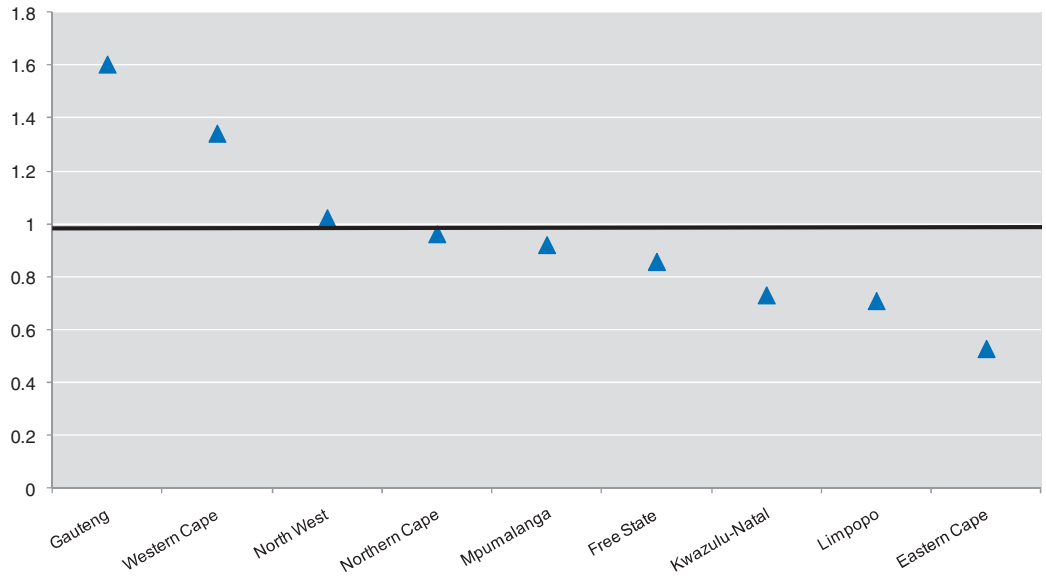
Figure 1.12. **GDP annual average growth rate, 1995-2008**



Source: OECD calculations based on Quantec data.

Figure 1.13. **Regional contribution to national performance**

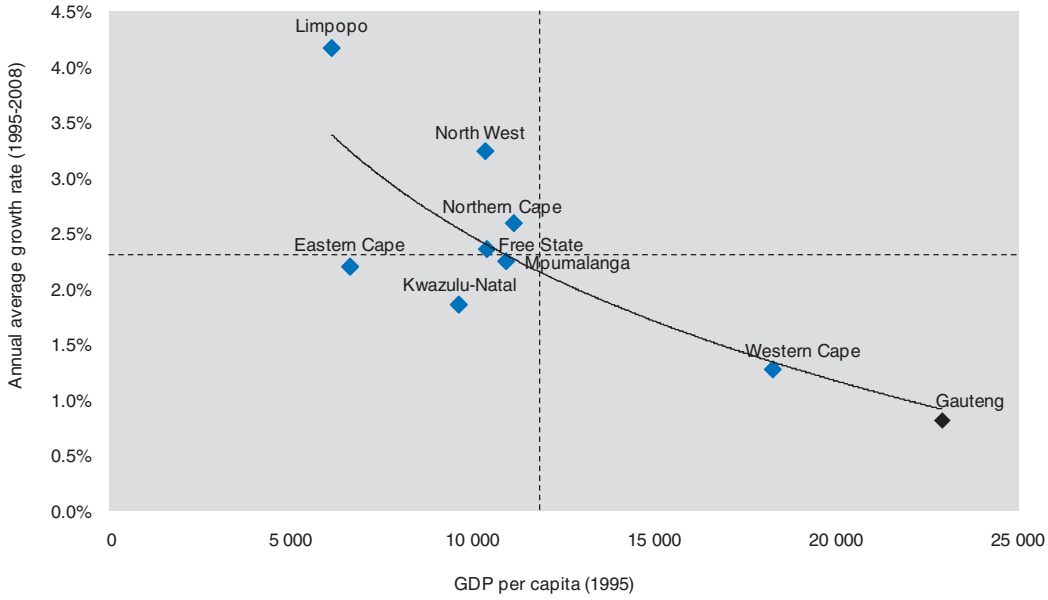
Ratio of regional contribution to national growth and regional share of national population



Source: OECD calculations based on data from Quantec.

However, Gauteng's economic growth still needs to improve by addressing lingering productivity levels and valorising the input of migration in the labour force. Although Gauteng's contribution to national growth is the most important and it performs well in terms of GDP, it shows the lowest average annual growth rate (0.8%) in terms of per capita GDP of any of South Africa's provinces between 1995 and 2008 (Figure 1.14). The low figures, however, are probably affected by its population growth and its ability to absorb a large number of domestic and international migrants. Gauteng's unimpressive performance for this indicator is a result of sluggish growth in some of the city-region's municipalities. Except for West Rand, Lesedi and Nokeng tsa Taemane, all municipalities in the city-region are growing at lower than average levels (Figure 1.15). Compared with OECD metro-regions, Gauteng is also underperforming in terms of per capita GDP growth. Growing annually at an average of 0.8% between 1997 and 2007, the Gauteng city-region's growth rate is close to that of Ankara and Naples, ranking 71 out of 91 (Figure 1.16). This is half the average for OECD metro-regions. In the case of Gauteng, the low economic growth stems chiefly from low productivity between 1995 and 2008, which did not increase in proportion with the growth of the labour force (Figure 1.17). Falling productivity impinges on per capita GDP growth rates, and the expanding labour force has not been able to compensate for a loss in productivity. Although migration and its growing labour force are assets, Gauteng's productivity needs to be addressed.

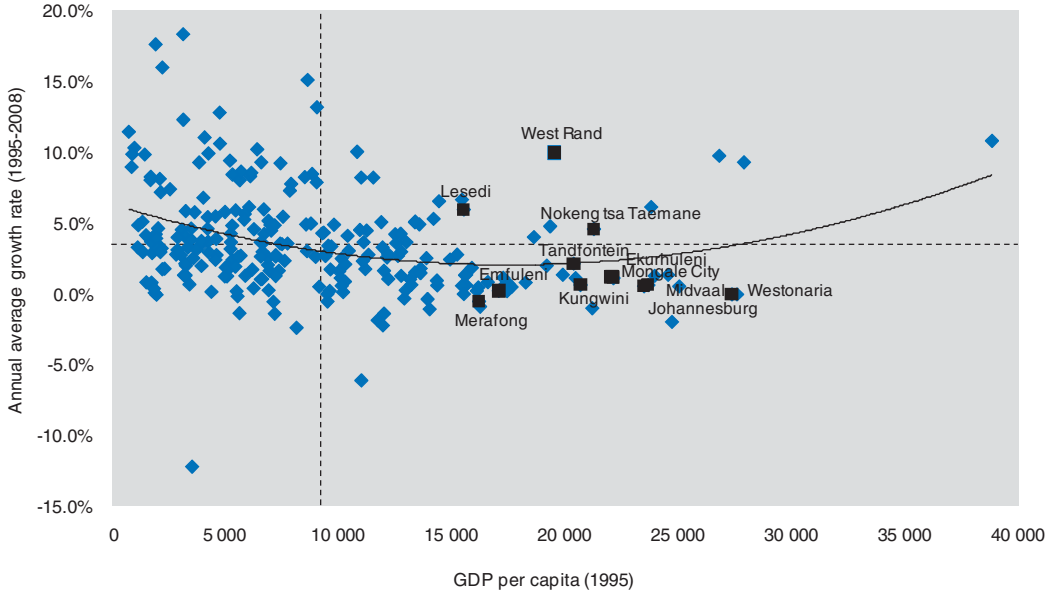
Figure 1.14. **GDP per capita annual average growth rate, 1995-2008**



Source: OECD calculations based on Quantec data.

Figure 1.15. **Municipal per capita GDP growth in the Gauteng city-region**

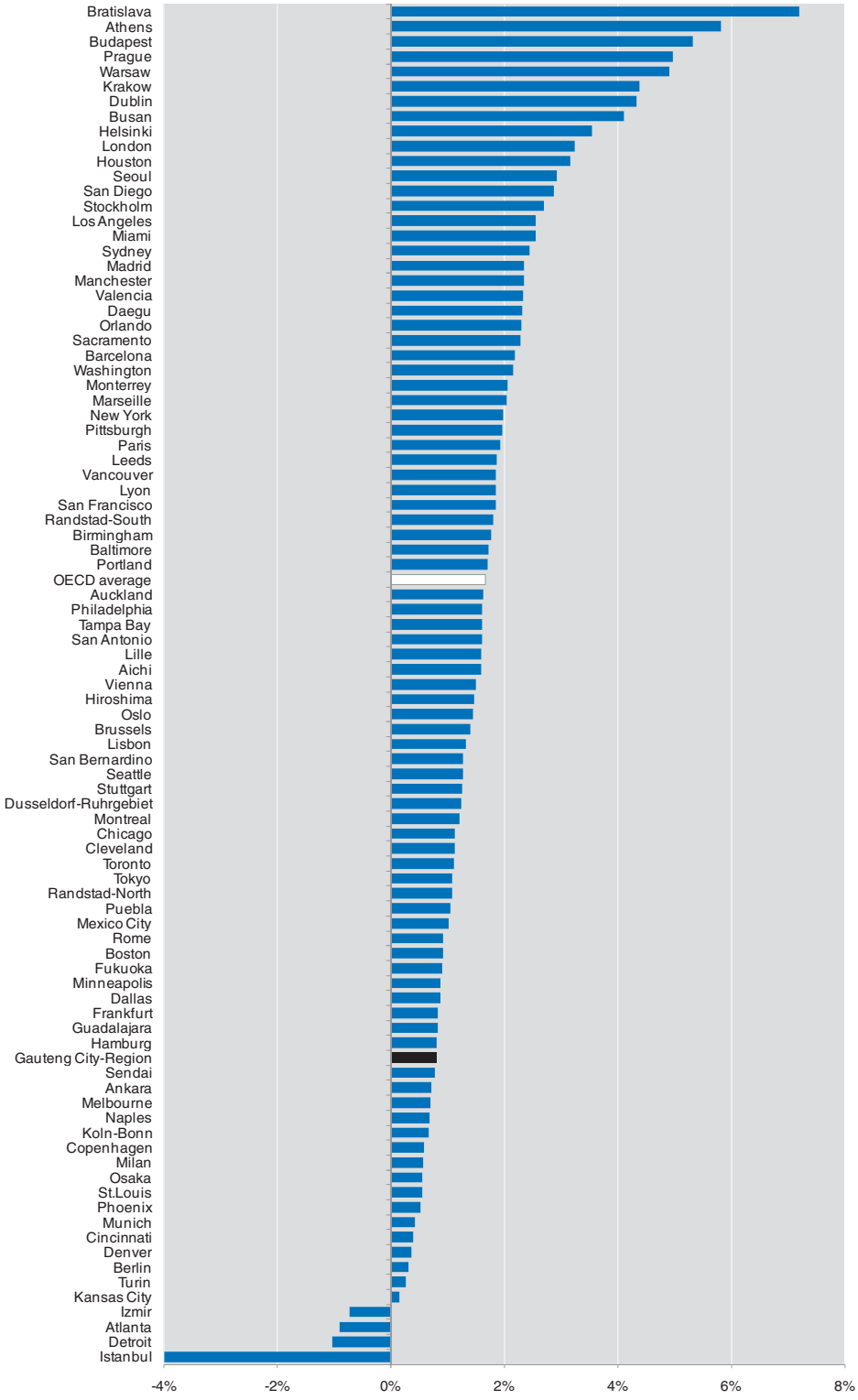
Average annual growth rates between 1995 and 2008



Source: OECD calculations based on Quantec data.

Figure 1.16. **Economic growth among OECD metro-regions**

Average annual growth rates for GDP per capita values (1997-2007)

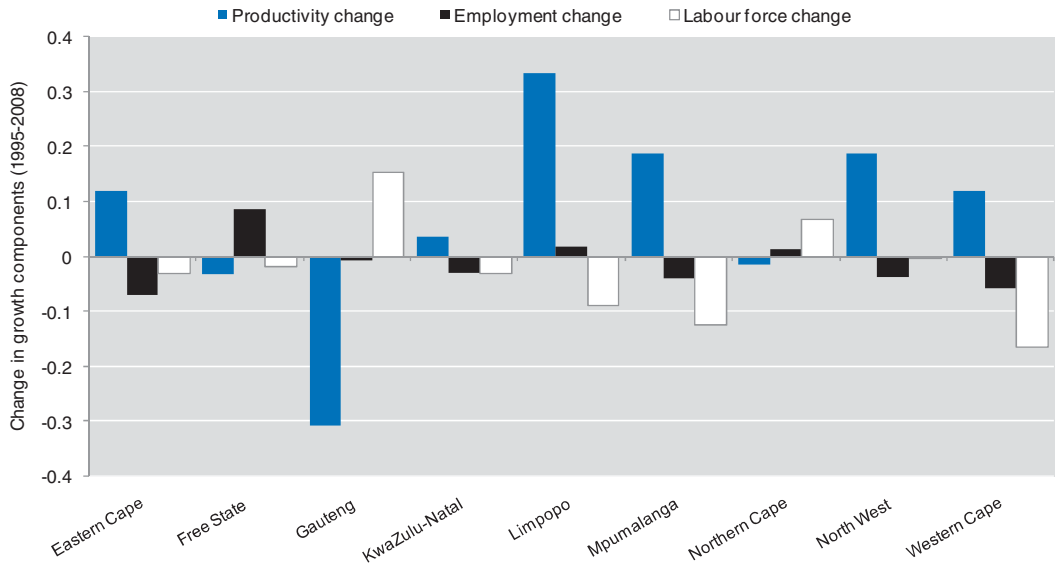


Note: Data for Gauteng refers to 1995-2008.

Source: *OECD Metropolitan Database* (2010) and Quantec.

Figure 1.17. **Decomposition of regional GDP per capita in South Africa**

Change in values for GDP per capita components (1995-2008)



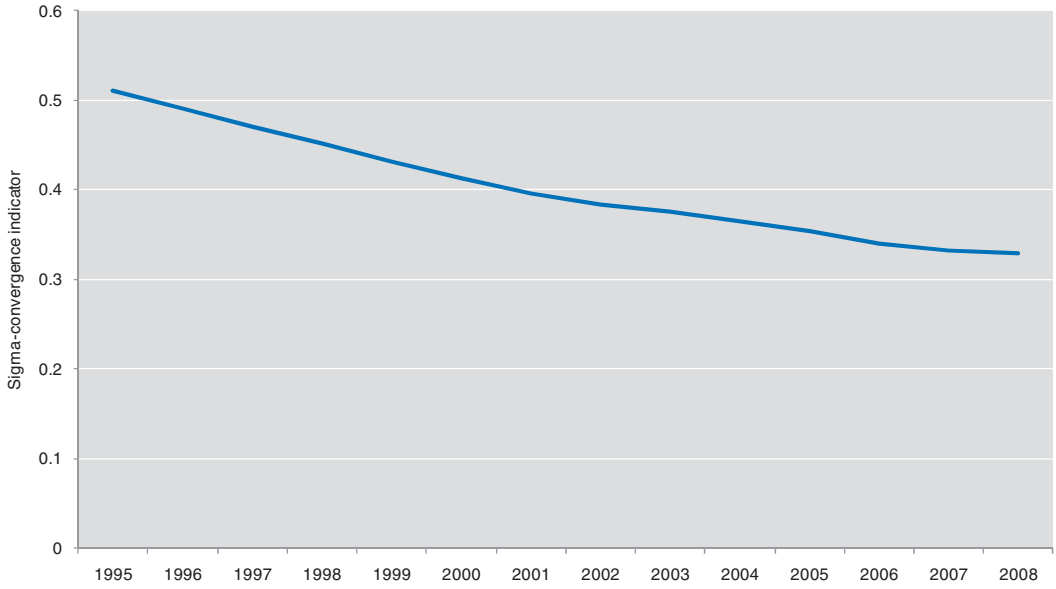
Notes: Decomposition is based on the equivalence between per capita GDP and three of its components: productivity, employment rate and participation rates. The change in values for components refers to the change between 1995 and 2008 for each province and each component. Decomposition is based on log values of the quotient of regional in respect to national figures for each variable.

Source: OECD calculations based on data from Quantec.

However, it is likely that low per capita GDP growth performance in Gauteng is also part of a pattern of regional convergence in South Africa. Regional disparities in Gauteng were in fact reduced over the 1995-2008 period. A traditional measure of territorial inequality is the Sigma-convergence indicator, which, as applied to South Africa, shows that the gap between South Africa's richest province (Gauteng) and its poorest (Limpopo) has narrowed from 0.51 to 0.33 over that 13-year period (Figure 1.18).[14] While disparities among provinces have consistently been falling, those among municipalities nationwide have been increasing, perhaps as a result of further concentration in urban centres outside Gauteng and the Western Cape (Figure 1.19). A similar trend of increasing concentration and falling disparities can be found in OECD member countries such as Belgium and Spain. Both countries have shown a decrease in disparities since 1980 (OECD, 2009a) while their concentration indicator has kept growing (OECD, forthcoming). A possible explanation of this effect is that while people may be continuing to concentrate in large and medium-sized cities and thus increase urbanisation, congestion costs as a part of centrifugal forces in the main economic centres might be resulting in a relatively better performance of medium-sized cities.

Figure 1.18. **Regional disparities in South Africa, 1995-2008**

Sigma-convergence indicator for provincial per capita GDP values

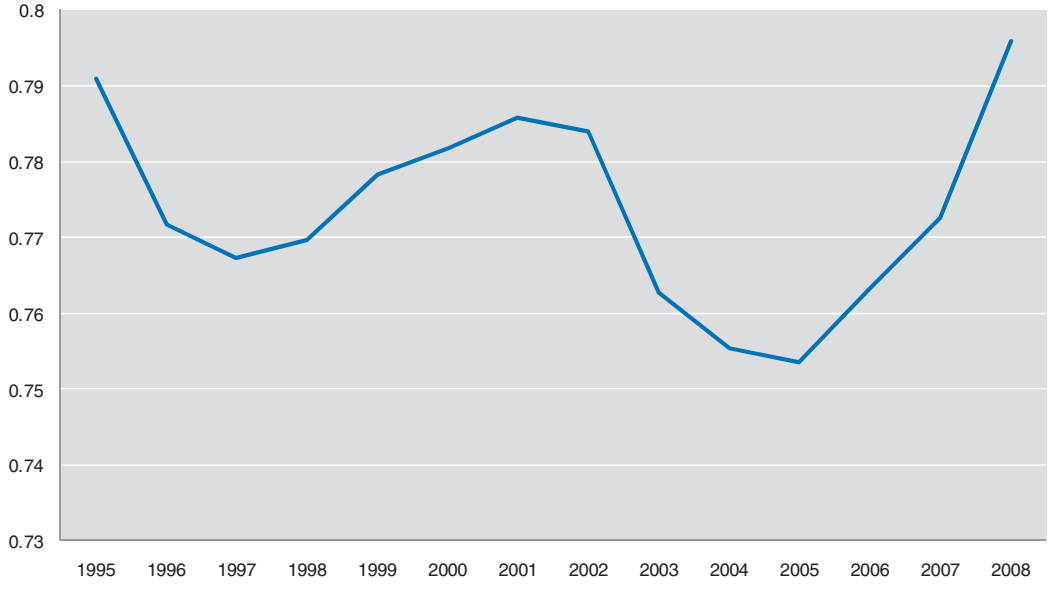


Note: The Sigma-convergence indicator is calculated using a standard deviation of logged values for the regions in a country.

Source: OECD calculations based on data from Quantec.

Figure 1.19. **Regional disparities at municipal level in South Africa, 1995-2008**

Sigma-convergence indicators using per capita GDP values at municipal level



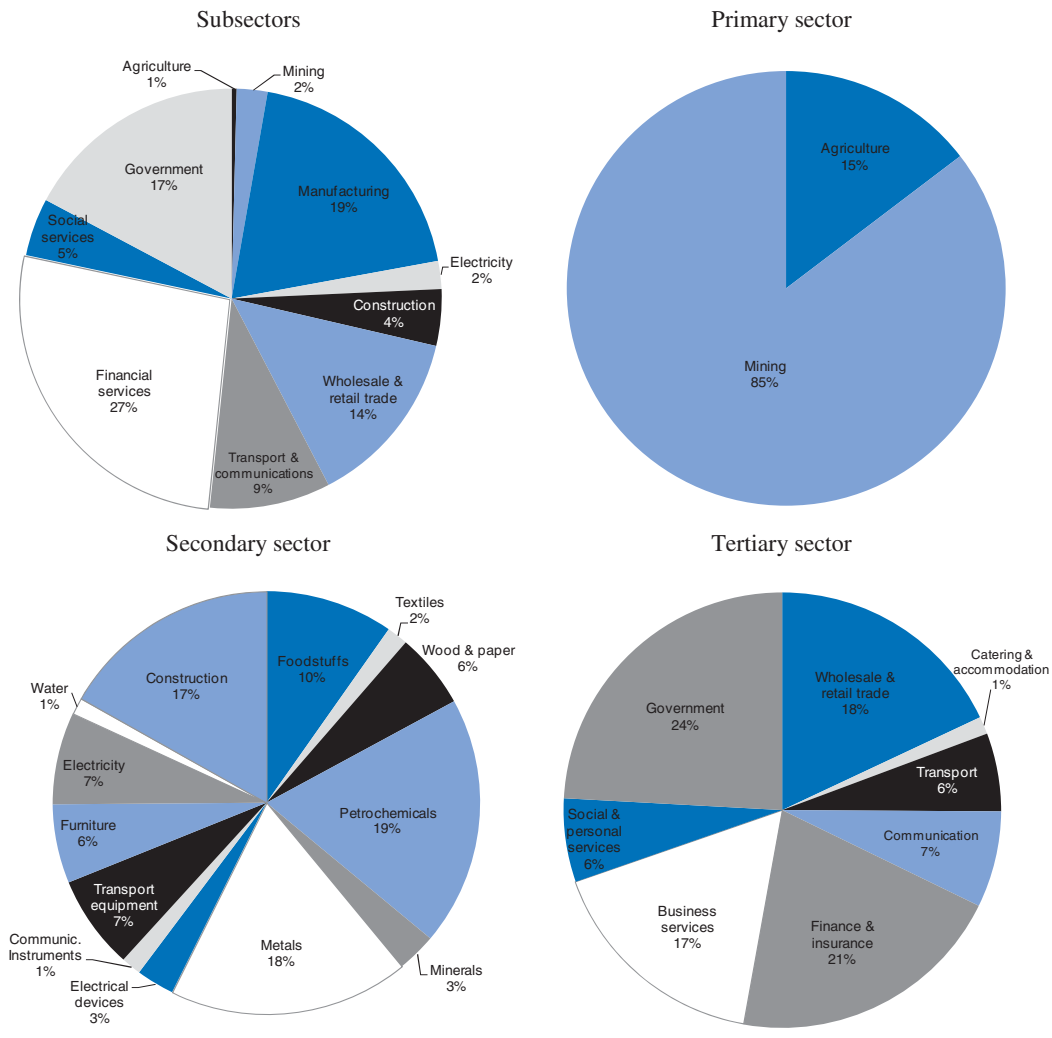
Note: The Sigma-convergence indicator is calculated using a standard deviation of logged values for the regions in a country.

Source: OECD calculations based on data from Quantec.

A diversifying economic structure concentrated in three cities

South Africa has undergone a dramatic structural change. Although Gauteng grew because it was one of the world's most important gold-mining centres, the tertiary sector now dominates the metropolitan economy, contributing 70% of GVA in 2009. The secondary sector contributed 25.3% in the same year, with construction in particular growing quickly, albeit off a small base. The relative growth of the tertiary sector has been accompanied by a steady decline in the weight of the primary sector. In 2009, mining and agriculture represented just over 3% of Gauteng's gross value-added (Figure 1.20). In the same period, almost 20% of GVA was in manufacturing, while financial services represented 27%. As the share of the economy going to finance and businesses services grew between 1995 and 2009, mining and agriculture have been relative losers over this period.

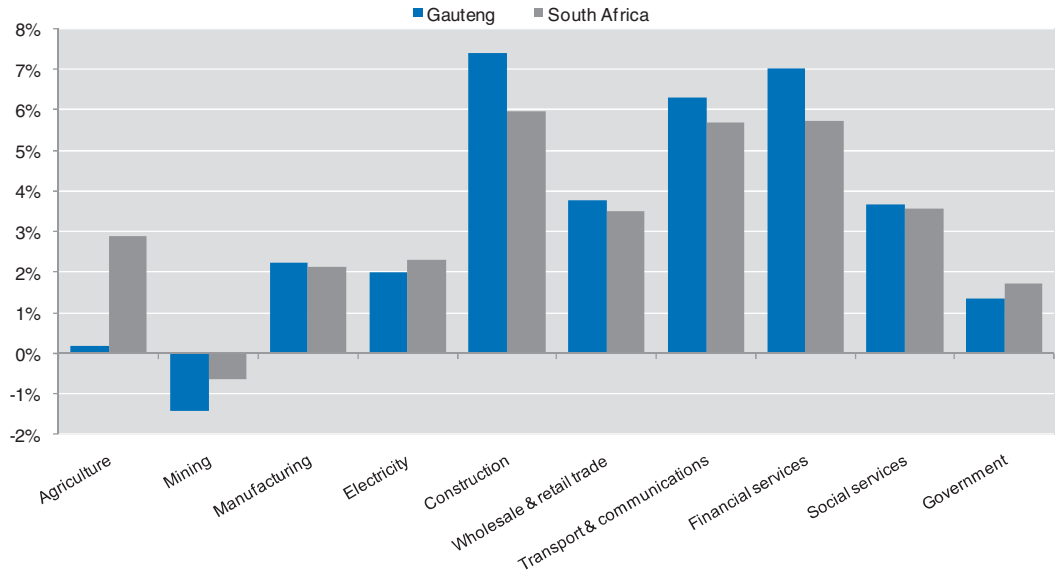
Figure 1.20. **Percentage of gross value-added by sector and subsector in Gauteng city-region, 2009**



Source: OECD calculations based on data from Quantec (2010).

Mining has radically declined in South Africa and Gauteng. While in 1990, gold represented 31% of South Africa's exports, by 2010 this had declined to 7%. Likewise, the number of gold miners declined from 481 178 to 159 745 over the same period. South Africa's share of world gold production has also fallen precipitously, from 67.7% in 1970 to 7.7% in 2009 (Nicol and Leger, forthcoming). Within Gauteng, the gross value added of mining fell at an average of 1.5% per year from 1995 to 2009, while GVA for agriculture remained stalled (Figure 1.21). Even while some subsectors such as manufacturing, electricity and government continue to grow in absolute terms, their expansion lags behind construction, as well as financial and business services. In fact, Gauteng has a higher than national-level GVA growth rate in all subsectors except for mining, agriculture, electricity and government.

Figure 1.21. **GVA annual growth rate for Gauteng and South Africa by subsector, 1995-2009**



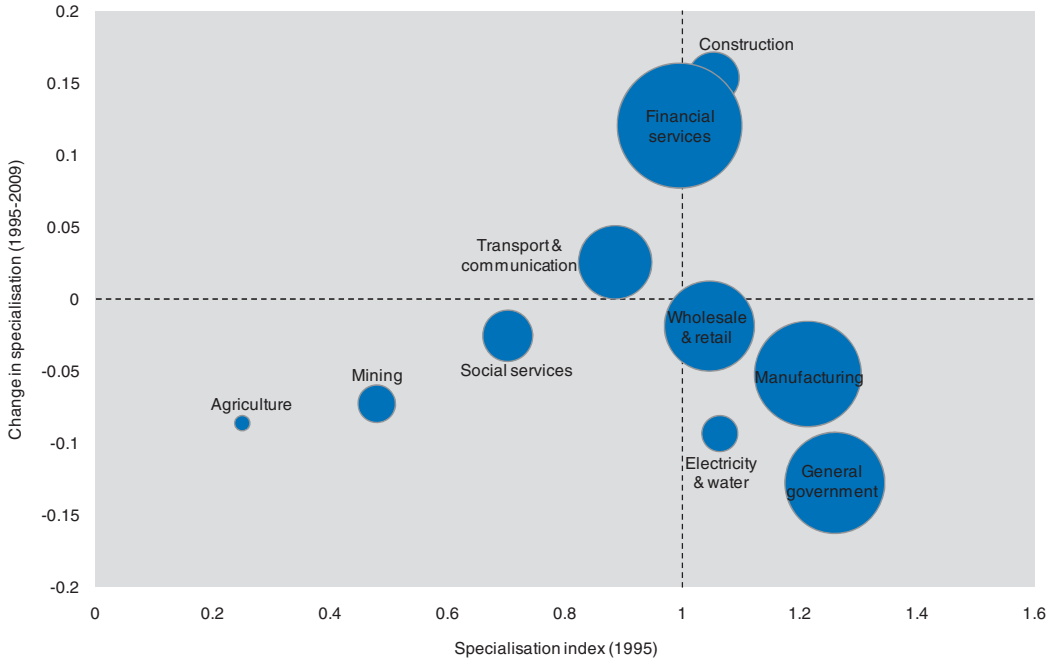
Source: OECD calculations based on data from Quantec (2010).

Such structural change has been fuelled by falling relative prices in manufacturing and international competition on tradables. As relative prices in manufacturing fell around 30% between 1970 and 2004, so did profits, and consequently incentives for firms to further invest in manufacturing. After the new democratic government took office and tariff barriers and trade embargoes were lifted, international competition intensified, leading to import competition and a decline in market shares by local companies.[15] As a result, manufacturing has increasingly been geared towards more capital-intensive activities, in which less unskilled and semi-skilled employment is needed. Consequently, in terms of employment, South Africa seems to have de-industrialised prematurely (Rodrik, 2006), and this has led to a dramatic change in its economic structure. By 2009, services contributed to 65.8% of GVA, followed by manufacturing (15.1%), and agriculture, forestry and mining (12.8%) (Figure 1.22). According to Golub (2000), South Africa's wage costs were competitive internationally but higher than most developing countries with which it competes for FDI and which are major exporters. By 1998, South Africa's wages stood at around one-fifth of those in Germany, Japan, the United Kingdom and the United States. Contrastingly, they were almost three times those in Indonesia, four times those in India and almost 50% higher than in Malaysia and Mexico (Golub, 2000). Although South Africa's wages are not growing as much as those

in other emerging economies, such as China, they are still accelerating more than in Mexico (Figure 1.23). High wages relative to competitors might have produced two non-mutually exclusive effects. First, they may deter investors from setting up operations in South Africa. Second, high wages might force companies to undertake capital deepening. As a result, workers may be required to attain upgraded skills that may not only push wages up but will require less workers. Alternatively, South Africa may not have de-industrialised prematurely, as Rodrik (2006) argues, but might have jumped a previous phase in industrialisation based on labour-intensive processes that help boost employment.

Figure 1.22. **Sectoral GVA dynamics in Gauteng, 1995-2009**

Change in GVA specialisation by sub-sector



Note: Bubble size denotes subsector size in terms of GVA. Specialisation is measured as $(lijt/Ljt)/(lit/Lt)$ where l is employment, i is industry, j is region and t is time. Thus, specialisation is the outcome of measuring employment shares in one industry i in region j compared to national industrial shares as a proportion of total national employment. Changes in specialisation refer to the percentage change in the value of specialisation in 2006 compared to that in 2000.

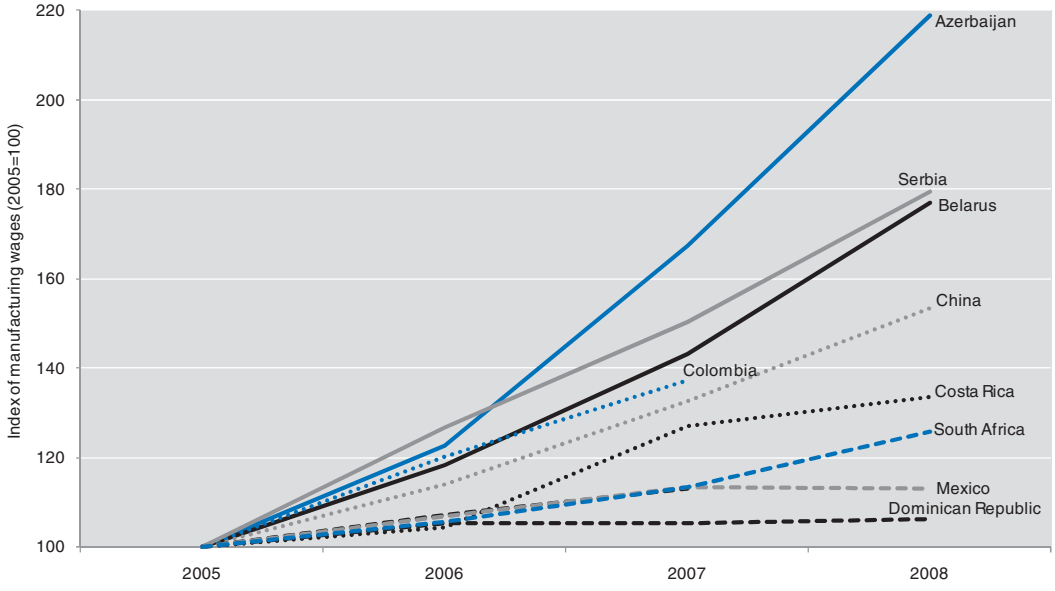
Source: OECD calculations based on data from Quantec.

However, the industrial shift has also brought about some diversification in the regional economy. Though the trade restrictions imposed during apartheid seem to have favoured a bias towards capital-intensive primary and manufactured commodities, the South African economy has slowly diversified and become less dependent on primary commodities. Diversification came rather late. In the early 1990s there was some re-orientation of South Africa's export basket, which created opportunities for further structural transformation (Hausmann and Klinger, 2006). After apartheid was dismantled, South Africa developed a comparative advantage in various iron and steel products, textile-related products, non-metallic mineral manufactures, specialised machinery,

organic chemicals, articles of pulp and paper, vegetables and fruits, petroleum products, metalliferous ores and metal scrap, oils and light perfume materials, and leather materials (OECD, 2008c). South Africa, however, has managed to create an economy where the structure of resource-based production is much more deeply embedded. Mining companies, for example, are active in creating new manufacturing technology and are supported by a vast number of companies in the services sector. In this sense, the South African resource-based economy appears to have more in common with earlier stages of the Scandinavian model of resource-intensive industrialisation than with Latin American and especially other African models (OECD, 2008c).

Figure 1.23. **Growth in manufacturing wages in South Africa and other emerging economies**

Manufacturing wages index (2005=100)

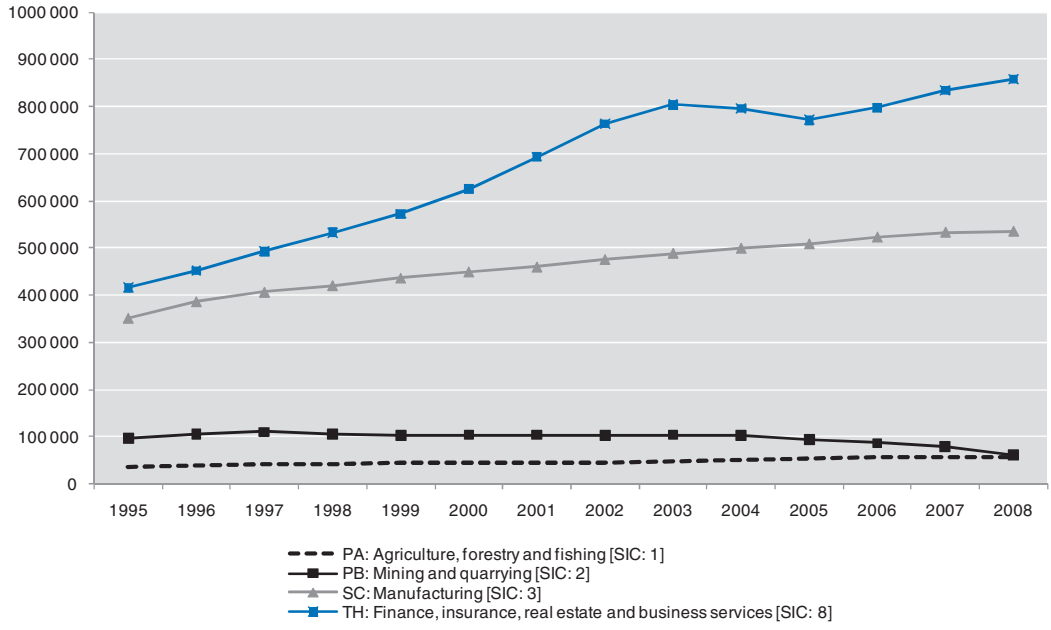


Source: International Labor Organization (2011).

This more diverse regional economy has at the same time become more concentrated in three municipalities within Gauteng. Johannesburg has contributed the most in all sectors, followed by Tshwane and Ekurhuleni. Economic output is overwhelmingly concentrated in these three metro-regions: in 2007, 88.6% of GVA resided in the three metropolitan municipalities, with its largest portion contributed by the city of Johannesburg, at 38.5%. The concentration level is up from 84.6% in 1995, illustrating a further agglomeration of productive capacity in the city-region's core. The city of Johannesburg contributed most in all of the sectors, with its tertiary sector making the largest contribution to the provincial economy at 50%. This is related to the fact that Johannesburg hosts the head offices of most of the major financial institutions, including the country's four main commercial banks. Ekurhuleni's largest contribution was in the secondary sector (driven by manufacturing) at 26.2% of the Gauteng city-region total. While Tshwane contributed 28.8% of the overall provincial tertiary sector, West Rand dominated in the primary sector because the district was historically the centre of mining in the province. Exports from the province are also concentrated in the city of Johannesburg and Ekurhuleni, which together made up more than 80% of total provincial exports for the period 1995-2008 (Gauteng Provincial Government, 2010).

Gauteng is consolidating its specialisation in financial services but its employment seems to be growing at a slower pace than national rates. Despite the fact that Gauteng is the financial centre of the country and employment in that sector is booming, the city-region is becoming less specialised in those activities because the activity is also thriving elsewhere in the country and Gauteng has increased its economic diversity. Nevertheless, provincial employment numbers in financial services doubled between 1996 and 2008, with particularly intense growth rates up to 2003. While there were an additional 442 084 jobs in financial services in 2008, other sectors contracted, most notably mining and quarrying which lost 36 756 jobs between 1996 and 2008 (Figure 1.24).

Figure 1.24. **Total employment evolution in Gauteng in select sectors, 1995-2008**



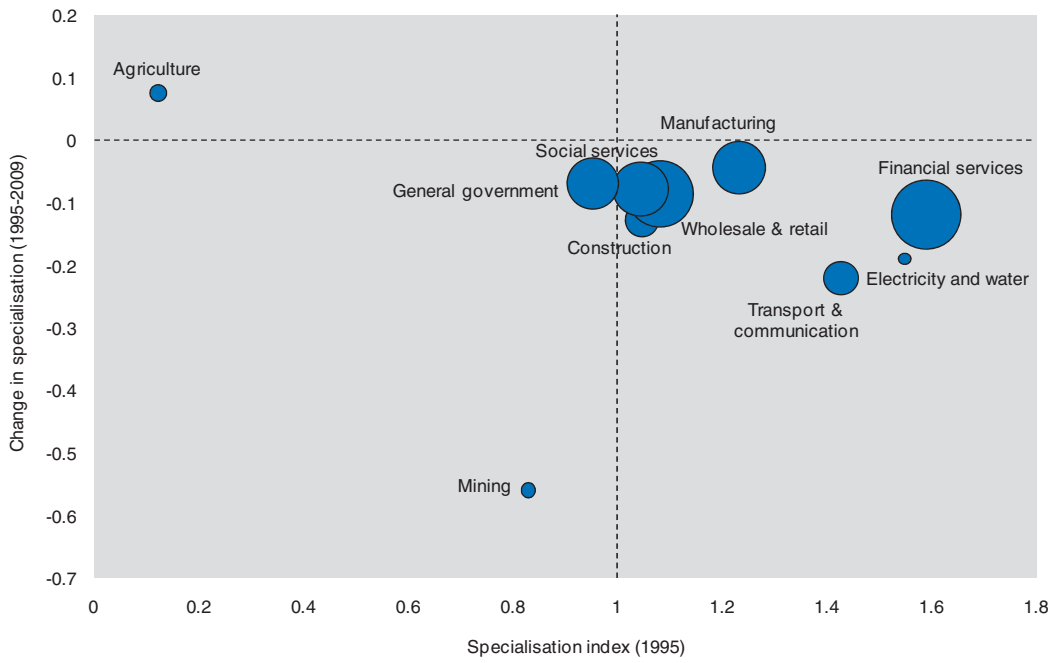
Source: OECD calculations based on data from Quantec.

Manufacturing employment has only recently grown and remains a key opportunity to boost employment, skills and equity in the province. In terms of GVA, Gauteng has been specialising in construction, financial services and transport (Figure 1.25). Other sectors have seen a decline in GVA specialisation indices, most notably in manufacturing, mining and government. Similarly, specialisation based on employment seems to be lagging behind growth at national level in almost all sectors (Figure 1.25). As specialisation indicators are measured in proportion to the national level, the fact that employment specialisation in almost all sectors has been slightly declining in Gauteng may signal the opening of new manufacturing and financial services centres elsewhere in South Africa. Manufacturing is an opportunity for Gauteng, as it can absorb labour supply, and the employment it provides given the technological level in the province could provide income for semi-skilled and unskilled workers. As jobs bring higher incomes, it becomes an equity-promoting tool for the unemployed and at the same time enhances skills through on-the-job training. Construction used to be an economic specialisation of Gauteng, but employment in the sector has grown less rapidly than national rates. A similar process has taken place in wholesale and trade. Specialisation changes in terms of both GVA and employment may well signal faster growth elsewhere

in the country. However, it may also signal a structural change in terms of the industrial processes being located in Gauteng. As every process becomes relatively more capital intensive, the use of unskilled and semi-skilled workers drops and thus specialisation indices fall. Such a change may also entail a spatial restructuring of the national economy, in which labour-intensive processes that yield greater job creation figures and boost employment-based specialisation indices relocate in less developed regions. Conversely, capital-intensive activities are being hosted in and around large metropolitan areas. As a result, employment absorption shrinks.

Figure 1.25. **Sectoral employment dynamics in Gauteng, 1995-2008**

Change in employment specialisation by sub-sector



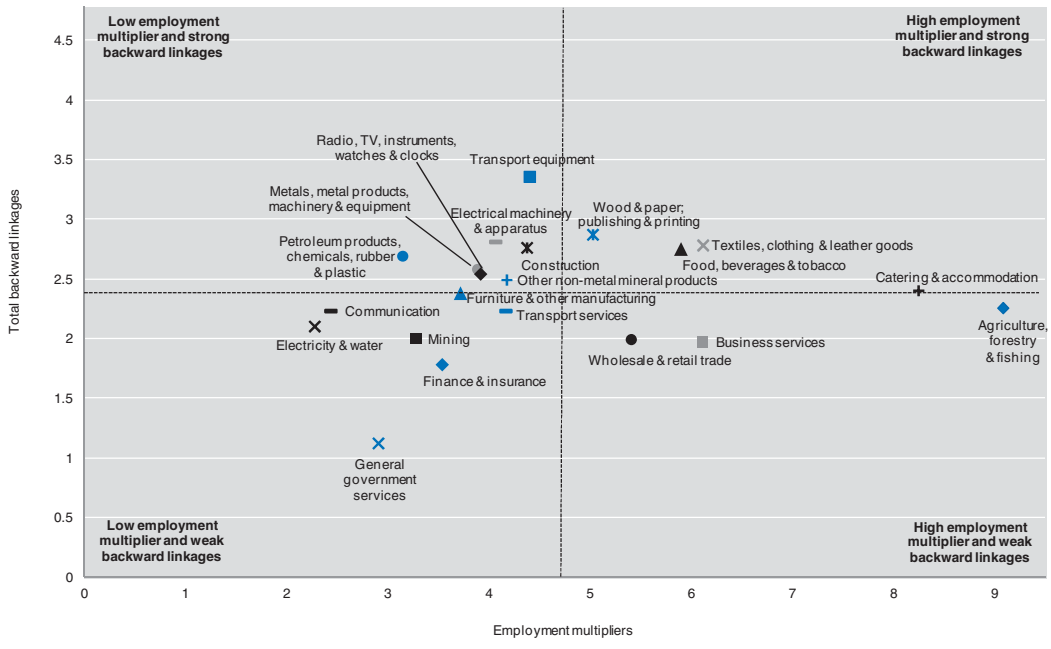
Note: Bubble size denotes subsector size in terms of employment. Specialisation is measured as (*Lijt*/*Ljt*)/(*Lit*/*Lt*) where *L* is employment, *i* is industry, *j* is region and *t* is time. Thus, specialisation is the outcome of measuring employment shares in one industry *i* in region *j* compared to national industrial shares as a proportion of total national employment. Changes in specialisation refer to the percentage change in the value of specialisation in 2006 compared to that in 2000.

Source: OECD calculations based on data from Quantec.

In addition to manufacturing, agriculture, services and construction can also contribute to job creation. According to the Corporate Strategy and Industrial Development Programme (CSID) study (2010), a ZAR 1 million increase in final demand for community, social and other personal services would generate 11 new jobs in activities that provide inputs for such services. This is followed by agriculture (9.08); catering and accommodation (8.25); textiles (6.12); business services (6.11); food, beverages and tobacco (5.90); and wholesale and retail trade (5.41). However, CSID (2010) notes that caution is warranted when interpreting these figures. An analysis of the institutional environment is needed taking account of factors that can limit the expansion of sectors owing to upstream restrictions and the lack of sensitivity to spatial factors, i.e. issues of transport and infrastructure.

The manufacturing sector has the largest backward linkages in the Gauteng economy and thus the potential for greater multiplier effects. Manufacturing, more than any other sector, is connected upstream to suppliers and thus facilitates a high number of backward linkages. For instance, an increase in manufacturing output will generate varying degrees of demand from the input of different sectors for use in their production processes. Sectors depend more on manufacturing demand for inputs than services. For example, value chain analysis suggests that a 1% increase in manufacturing's final demand for inputs stimulates the tertiary sector's intermediate output by 16.46%. Likewise, a 1% increase in manufacturing's final demand for inputs is correlated with a 35.86% increase in the intermediate output of the manufacturing sector itself and a 12.95% increase in intermediate output from the mining sector (Table 1.1). Accordingly, manufacturing has been referred to as "the centre of growth generation within the Gauteng economy" (CSID, 2010). It can also have effects in boosting exports and absorbing unskilled workers from agriculture and social services. Within the manufacturing sector, six sectors have both high employment absorption and high stimulatory power with respect to output, given their capital intensity. These high employment absorption/high output sectors include: transport equipment; wood and paper; publishing and printing; textiles, clothing and leather; food, beverages and tobacco; and other non-metal minerals (Figure 1.26).

Figure 1.26. **Backward linkages and employment multipliers in the Gauteng city-region, 2007**



Source: Corporate Strategy and Industrial Development Programme (2010), "The Development of an Industrial Policy for Gauteng Province", School of Economics and Business Sciences, University of the Witwatersrand, Johannesburg, preliminary report.

Table 1.1. **Direct backward linkages in Gauteng, 2007 (%)**

	Agriculture	Mining	Manufacturing	Electricity, gas, water	Construction	Tertiary
Agriculture	3.06	0.02	6.56	0.03	0.01	0.10
Mining	0.89	0.51	12.95	15.50	6.08	0.25
Manufacturing	29.39	14.53	35.86	7.31	0.29	10.81
Electricity, gas, water	0.98	2.46	1.22	15.49	0.29	0.90
Construction	0.26	0.31	0.00	3.17	18.25	0.95
Tertiary	16.35	24.32	16.46	9.37	13.42	31.38

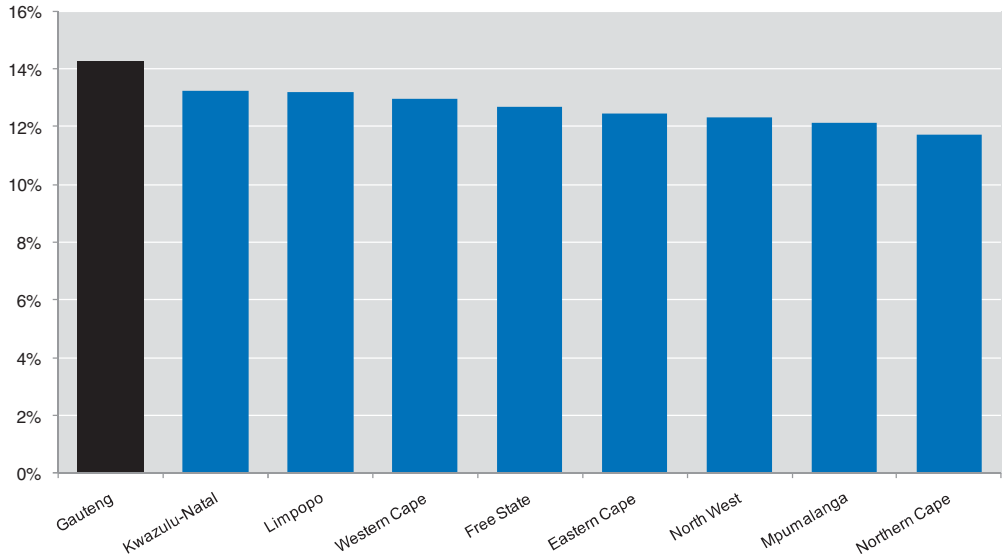
Source: Corporate Strategy and Industrial Development Programme (2010), "The Development of an Industrial Policy for Gauteng Province", School of Economics and Business Sciences, University of the Witwatersrand, Johannesburg, preliminary report.

Progress achieved and remaining gaps in education

Gauteng has increased its share of the number of adults with formal schooling and tertiary education and is the South African province with the highest share of high-skilled workers. High-skilled workers[16] in Gauteng represent 14% of all employed workers (Figure 1.27). This proportion rose in the period 2000-09 from 14.7% to 19.4%. According to the *General Household Survey* (2010), the proportion of adults lacking any formal schooling in Gauteng almost halved between 2002 and 2010, dropping from 4.5% to 2.9%. This is much lower than the national average, which dropped from 10.9% to 7.0% over the same period.[17] These figures suggest that the huge investment in education by the post-apartheid government has been paying off, although concern remains as to the quality of the education and the results achieved. Those who have completed schooling rose from 22.3% of the population aged 25 and over in Gauteng in 2000 to 30.7% in 2010. This compares with 25.4% of the national population 25 and over in 2010, according to the *Labour Force Survey* (2010).[18]

However, from an international perspective, South Africa is still far from OECD standards and ranks relatively low by comparison with successful emerging economies. Three international learning achievement assessments, namely, the Monitoring Learning Achievement (MLA) project, Trends in International Mathematics and Science Study (TIMSS) and the Southern and Eastern African Consortium for Monitoring Educational Quality (SAQMEC), indicate that South African children performed exceptionally poorly by comparison with those of the other countries that participated.[19] The MLA project was conducted in several African countries in 1999 and measured the competencies of Grade 4 learners in numeracy, literacy and life skills. Of the 12 participating countries, South Africa scored the lowest average in numeracy, the 5th lowest in literacy and the 3rd lowest in life skills (Table 1.2) (OECD, 2008c).

Figure 1.27. **Proportion of employed with higher education in South African provinces, 2008**



Source: OECD calculations based on data from Quantec.

Table 1.2. **Monitoring learning achievement scores for numeracy, literacy and life skills, 1999 (%)**

	Numeracy average	Literacy average	Life skills average
Botswana	51.0	48.0	56.0
Madagascar	43.7	54.7	72.1
Malawi	43.0	35.0	77.0
Mali	43.6	51.8	56.9
Mauritius	58.5	61.0	58.0
Morocco	56.4	67.6	62.3
Niger	37.3	41.1	44.7
Senegal	39.7	48.9	45.7
South Africa	30.2	48.1	47.1
Tunisia	60.4	77.9	74.7
Uganda	49.3	58.7	66.8
Zambia	36.0	43.0	51.0

Source: Chinapah, V. (2000), *With Africa for Africa: Towards Quality Education for All*, Human Sciences Research Council, Pretoria; Strauss, J. and M. Burger (2000), *Monitoring Learning Achievement Project*, Department of Education, Pretoria, cited in OECD (2008), *OECD Reviews of National Policies for Education: South Africa 2008*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264053526-en*.

Gauteng's relatively poor performance compared to similar economies lies in a polarisation of educational opportunities. Only 11.8% of Black Africans 25 years and older attained tertiary education in 2010, while for whites, the proportion was some four times higher, at 42.2%. While 61% of Gauteng's Black Africans had some secondary schooling or had actually completed secondary education in 2004, the best hope one-third of them could have was to complete primary schooling. The problem is most acute in the Metsweding municipality, where around one-third of the population aged 20 and over had either no formal schooling or incomplete primary education. Desertion after completing primary education also undermines educational attainment. Only between 4.2% of students (Tshwane) and 7.4% (West Rand) completed primary and did not attain further

education in 2001. In Gauteng, 11.2% of the population over 20 had some primary education, but did not complete primary school (Statistics South Africa, 2006, based on *Statistics South Africa, Population Census 2001*).

The problem in Gauteng is not only insufficient tertiary education, polarised opportunities for higher education and the absence of or incomplete primary schooling, but also the skills mismatch in the labour market. Deficiencies in education and training contribute to this problem. As in many other countries, years of education and the probability of being unemployed are highly correlated in South Africa, but the discrepancy between employment probabilities for those at the lower and upper ends of the skill distributions is particularly large. A common thesis is that in a world of skill-biased growth, South Africa has failed to improve education and training sufficiently to allow the skills of the labour force to keep pace with demand. At the same time, Gauteng residents are probably not equipping themselves with the skills demanded in the marketplace. According to the Gauteng Provincial Government (2009a), in 2008, almost 30% of the demand for skills in South Africa was in mining, construction and engineering, and only 12% of degrees in Gauteng were in those fields (Statistics South Africa, 2006). In contrast, demand for banking and finance skills dropped between 2005 and 2008 from 16% to 12%, but Gauteng students still favour business and management degrees (which account for 23.3% of all provincial degrees). The greatest increase in demand was experienced in IT and telecommunications, rising from 4% to 17% of skills demand over the same period (Gauteng Provincial Government, 2009a). Yet, only 8% of all provincial degrees are related to IT (Statistics South Africa, 2006). Nevertheless, the gaps in high-level skills do not take into account skills that will address the high unemployment rate that the country and the province faces, such as welding, plumbing, building, etc. Data are not currently available to show skills by occupation, especially in medium- to low-skilled jobs.

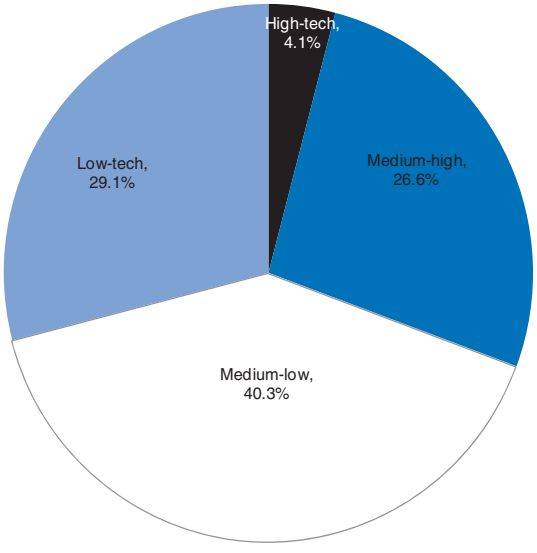
Africa's manufacturing and innovation hub despite low entrepreneurship and SME activity

Mining and natural resources' contribution to South Africa's GDP has dropped in the past two decades, but the Gauteng city-region has developed assets in manufacturing and a large services sector that require research and development (R&D) and innovation in its broadest sense. This section will first review the city-region's diverse asset base in manufacturing and innovation capacity. In light of its need to create and exploit new products, processes and services in order to become a competitive, socially cohesive, global player (Gauteng Provincial Government, 2009c), the second part of the section will present a number of deficiencies of its innovation and R&D systems. Gauteng's technological structure does not appear to be moving fast enough towards forms of production that are knowledge intensive, raise productivity and generate higher income. This is exacerbated by low levels of entrepreneurship by comparison with both advanced and developing countries. South Africa's National Research and Development Strategy (Government of the Republic of South Africa, 2002) identified key weaknesses in the national innovation system, all of which apply to Gauteng. These include: *i)* the need to maintain a super-critical R&D community, in support of strategic needs and to generate national absorptive capacity; *ii)* a failure to renew human resources for science and technology, as the predominantly white male research community is ageing and not being replaced in sufficient numbers; and *iii)* declining investments in formal R&D by South African companies.

Gauteng's manufacturing assets

The Gauteng city-region has a manufacturing profile of medium-high, medium-low, and low-tech industries, without much capacity for high-tech. Applying the OECD classification of manufacturing industries based on technology, Gauteng's industry is led by medium-low tech (ZAR 33.06 billion or 40.3% of total) and followed by low-tech (ZAR 23.8 billion or 29.1%), medium-high (ZAR 21.8 billion or 26.6%), and lastly, high-tech (ZAR 3.3 billion or 4.1%) (Figure 1.28). At 41%, Ekurhuleni has the highest manufacturing turnover overall (ZAR 33.4 billion) as well as the highest medium-high tech (ZAR 10.6 billion) which represents 48% of that technological segment. Located in the centre-west part of the province, Ekurhuleni also accounts for 46% of all medium-low tech (ZAR 15.3 billion) manufacturing turnover in the Gauteng region and ranks second in high-tech (26%) (Table 1.3). With 35% of the provincial total, the Johannesburg municipal area has Gauteng's second-largest turnover in manufacturing, but with nearly half of all turnover in the high-tech segment, it has become the greatest high-tech concentration in the province (ZAR 1.6 billion). Paradoxically, Johannesburg also has the largest share of low-tech manufacturing (ZAR 1.4 billion or 48%) in the province. Tshwane has ZAR 740 million in high-tech manufacturing turnover, comparable with Ekurhuleni's ZAR 885 million. Tshwane, however, has roughly only one-third of total manufacturing turnover of either Johannesburg or Ekurhuleni. Four municipalities have between ZAR 25 million and ZAR 45 million in high-tech turnover (Emfuleni, Kungwini, Midvaal and Mogale City), while five municipalities register no high-tech manufacture at all (Lesedi, Merafong, Nokeng tsa Taemane, Randfontein and Westonaria). High-tech manufacturing only generates 4.1% of the total turnover in Gauteng (Figure 1.28).[20]

Figure 1.28. **Share of manufacturing in Gauteng by technological level, 2008**



Source: OECD based on AfriGIS and Matrix Marketing Bizmaps/Prospector Database & CeSTII, compiled in Rumbelow, J. et al. (2010), "Background Report on Innovative Capacity and R&D for Gauteng Region OECD Territorial Review", mimeo.

Table 1.3. **Manufacturing turnover by technology class in Gauteng municipalities, 2010**

(% share)

	Manufacturing technology class (OECD)			
	High-tech	Medium-high	Medium-low-tech	Low-tech
Ekurhuleni	2.56	31.64	45.68	20.12
Emfuleni	1.06	17.55	61.52	19.87
Johannesburg	5.65	24.32	30.40	39.64
Kungwini	3.65	9.49	42.34	44.53
Lesedi	0.00	20.27	35.14	44.59
Merafong City	0.00	55.36	35.71	8.93
Midvaal	3.36	18.28	60.82	17.54
Mogale City	0.82	21.35	55.34	22.50
Nokeng tsa Taemane	0.00	4.76	52.38	42.86
Randfontein	0.00	18.22	49.80	31.98
Tshwane	7.11	23.16	37.15	32.58
Westonaria	0.00	16.00	60.00	24.00

Source: AfriGIS and Matrix Marketing Bizmaps/Prospector Database & CeSTII (May 2010 release), compiled in Rumbelow, J. et al. (2010), "Background Report on Innovative Capacity and R&D for Gauteng Region OECD Territorial Review", mimeo.

In terms of employment generation, data suggests relative manufacturing strength in generating turnover per employee in medium-low-tech manufacturing industries.[21] High-tech manufacture supplies only 4.29% of manufacturing jobs in Gauteng, while medium-high (33.63%), medium-low (29.57%) and low-tech (32.51%) supply the lion's share of the 844 000 manufacturing jobs. No Gauteng municipality draws the majority of its manufacturing employees from high-tech manufacturing (as per the OECD definition of high-tech) (Table 1.4). Interestingly, medium-low-technology manufacturing generates substantially more turnover per employee (ZAR 133 000) than any other OECD manufacturing technology class. In fact, all other tech classes are below the average (ZAR 97 000). Gauteng has relative manufacturing strength in generating turnover per employee in medium-low-tech manufacturing (Table 1.5). This particularly includes the following industries: rubber and plastics products, coke and refined petroleum products, other non-metallic mineral products, and basic metals and fabricated metals products.

Table 1.4. **Gauteng municipal manufacturing employees by OECD technology class, 2010**

	Manufacturing technology class (OECD)				
	High-tech	Medium-high	Medium-low	Low-tech	All manufacture
Ekurhuleni	14 098	47 712	99 469	128 041	289 320
Emfuleni	84	1 648	2 580	23 834	28 146
Johannesburg	17 271	193 707	85 192	83 345	379 515
Kungwini	87	1 104	567	2 102	3 860
Lesedi	0	593	267	370	1 230
Merafong City	0	95	531	362	988
Midvaal	116	1 579	1 115	5 253	8 063
Mogale City	91	3 376	3 124	10 283	16 874
Nokeng tsa Taemane	0	104	5	161	270
Randfontein	0	5 780	1 286	2 710	9,776
Tshwane	4 416	27 948	55 225	17 184	104 773
Westonaria	0	80	70	597	747
Total	36 163 (4.29%)	283 726 (33.63%)	249 431 (29.57%)	274 242 (32.51%)	843 562 (100.00%)

Source: AfriGIS and Matrix Marketing Bizmaps/Prospector Database & CeSTII (May 2010 release), compiled in Rumbelow, J. et al. (2010), "Background Report on Innovative Capacity and R&D for Gauteng Region OECD Territorial Review", mimeo.

Table 1.5. **Turnover per employee per OECD manufacturing class, 2010**

Manufacturing technology class (OECD)				
High-tech	Medium-high	Medium-low	Low-tech	Manufacturing average
92 220	76 869	132 562	86 912	97 260

Source: AfriGIS and Matrix Marketing Bizmaps/Prospector Database & CeSTII (May 2010 release), compiled in Rumbelow, J. et al. (2010), "Background Report on Innovative Capacity and R&D for Gauteng Region OECD Territorial Review", mimeo.

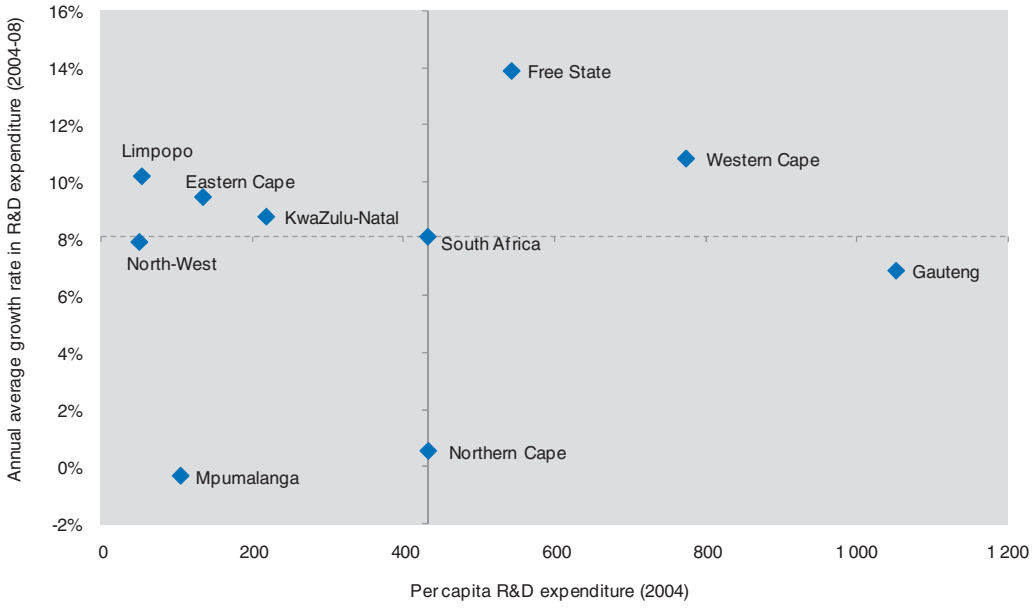
Gauteng's R&D profile

Although Gauteng is South Africa's innovation hub, recent growth in R&D expenditure shows a slowdown compared to the national level. The Gauteng city-region is South Africa's leader in R&D, accounting for 52.2% (ZAR 11 billion) of the total national R&D expenditure in 2008-09.[22] Trends are also positive in growth of R&D expenditure, though they are slightly behind the national rates. On average, Gauteng's real annual growth rates stood at 6.8%, slightly lower than the 8.1% achieved nationally from 2004-08 (Figure 1.29). In 2008, Gauteng's R&D as a percentage of GDP rose from 1.42% to 1.45%, which compares with the OECD regional average of 1.58%, a figure nonetheless below the 3% target set by the European Union in the Lisbon Agenda.

Within South Africa, considerable R&D infrastructure is concentrated in Gauteng, though the contribution from higher education is low when compared to OECD regions. In 2008-09, Gauteng was the province with the highest per capita R&D expenditure. At ZAR 1 051, Gauteng's per capita expenditure in R&D was more than double the South African average (ZAR 432), far above the next in line, the Western Cape (ZAR 773) (for Science, Technology and Innovation Indicators, 2010 National R&D Survey). In 2009, the business sector[23] in Gauteng was the leading contributor to R&D (64.9%), followed by science councils (18.1%), higher education (13.4%), government (2.4%), and the not-for-profit sector (1.1%) (Table 1.6). The large share of R&D provided by businesses places Gauteng in the category of entrepreneurial Catalonia (65.0%),

Ontario (62.0%) or New York state (67.1%). Between 2008 and 2009, business services that included engineering services drew the largest share of R&D (ZAR 892 million or 39.2%) in the high-tech services sector, with computer and related services (26.6%) and financial services (23.7%) following thereafter. Gauteng's infrastructure includes eight universities, nine science councils and considerable private sector infrastructure.[24]

Figure 1.29. **Provincial R&D expenditure, 2004-08**



Source: Centre for Science, Technology and Innovation Indicators (2004), *South African National Survey of Research and Experimental Development (R&D), 2001/02*, Department of Science and Technology of South Africa, Pretoria; Centre for Science, Technology and Innovation Indicators (2010), *South African National Survey of Research and Experimental Development (R&D), 2008/2009*, Department of Science and Technology of South Africa, Pretoria; Statistics South Africa (2004), "Mid-year Population Estimates", GDP, Statistics South Africa, Pretoria.

Table 1.6. **Distribution of R&D by sectors: Gauteng (2009) and OECD regional average (2007)**

	Business enterprise	Government and science councils	Higher education	Not-for-profit
Gauteng	64.9%	20.5%	13.4%	1.1%
OECD regional average	59.4%	14.4%	24.8%	1.3%

Note: Government contribution includes Gauteng's science councils. These include nine statutory bodies: the Africa Institute of South Africa, the Council for Minerals Technology (Mintek), the Agricultural Research Council (ARC), the Human Sciences Research Council, the National Research Foundation, the Medical Research Council (MRC), the Council for Geoscience, the South African Bureau of Standards and the Centre for Scientific and Industrial Research. Science council R&D infrastructure is made up predominantly of the CSIR (1 071.4 FTE researchers in 2008-09), the ARC (111.6), the MRC (99.6), Mintek (69.2) and the Council for Geoscience (54.4) sharing the majority of full-time-equivalent researchers in 2008-09.

Source: Department of Science and Technology of South Africa (2010), *South African National Survey of Research and Experimental Development (R&D) 2008/9*, Human Sciences Research Council, Pretoria. Conducted by the Centre for Science, Technology and Innovation Indicators (CeSTII) within Human Sciences Research Council (HSRC), compiled in Rumbelow, J. et al. (2010), "Background Report on Innovative Capacity and R&D for Gauteng Region OECD Territorial Review", mimeo.

Gauteng is a centre of higher-level education in the country, and higher education R&D infrastructure is concentrated at the University of Pretoria, the University of the Witwatersrand, the University of South Africa, and the University of Johannesburg.[25] The University of Witwatersrand and the University of Pretoria are the two leaders in terms of full-time researchers and total R&D expenditure (Table 1.7). Gauteng's universities attract a considerable number of students from within South Africa and from other African countries. After migrating to South Africa for their studies, many students stay on afterwards. Overall, Gauteng provides over 40% of tertiary education in South Africa.

Table 1.7. **Total R&D expenditure and researcher full-time equivalents (FTEs) at Gauteng-based higher education institutions, 2007 and 2009**

Universities	Student enrolment	Total R&D expenditure (ZAR)		Researcher FTE only	
	2009	2009	2007	2009	2007
University of Pretoria	57 409	551 344 000	333 265 000	360.1	540.02
University of the Witwatersrand	28 204	616 702 000	534 984 000	263.8	248.0
University of Johannesburg	55 700	128 455 000	148 781 000	147.3	150.2
University of South Africa	250 000	146 730 000	131 405 000	235.2	259.1
Tshwane University of Technology	60 000	55 076 000	74 439 000	70.5	91.5
Vaal University of Technology	17 000	19 113 000	16 128 000	29.0	22.0
Monash University (private)	59 925	13 358 000	9 210 000	21.2	20.4
Total	528 328	1 530 778 000	1 248 212 000	1 127.1	1 151.6
Other[1]		73 066 730	77 582 060	64.4	96.6

Notes: Not including postdoctoral and PhD students. Researchers do not include technicians and other personnel directly supporting R&D.

1. Denotes collective R&D of other HEIs in Gauteng, where institutions are not predominantly Gauteng-based. Provincial R&D expenditure is used to approximate FTEs in the category "Other". 2. This FTE outlier is revised to 360.4 FTEs when contributing to the total and can be ascribed to a change in the survey respondent at the institution and where the following year measurement was correct.

Source: Department of Science and Technology of South Africa (2010), *South African National Survey of Research and Experimental Development (R&D) 2008/9*, Human Sciences Research Council, Pretoria. Conducted by the Centre for Science, Technology and Innovation Indicators (CeSTII) within Human Sciences Research Council (HSRC), compiled in Rumbelow, J. et al. (2010), "Background Report on Innovative Capacity and R&D for Gauteng Region OECD Territorial Review", mimeo.

The expansion of innovative capacity throughout the economy would benefit from a considerable expansion of university research, given the ageing of university researchers and the limited ability of the human resource pipeline to deliver replacements for them. Though South Africa's Department of Trade and Industry has recognised the need to develop a new SME-centred mechanism in universities, non-university higher education institutes and polytechnic research institutes have played a less important role. This runs counter to the experience of many OECD member countries, where non-university centres provide hands-on training in production and business administration required to tackle the needs of small firms (OECD, 2007).

The effectiveness of the overall innovation system over the next decade will depend on the depth and diversity of innovation capabilities that are accumulated by, and deployed in, business enterprises. Over-emphasis on the public contribution to innovation should be avoided, given that the business sector has been the highest performing sector for R&D in the Gauteng city-region. Business enterprises play major roles in turning knowledge into improved livelihoods, higher incomes and public services delivered, but

also in generating the knowledge and human capital to undertake those tasks (OECD, 2007). Between 2008 and 2009, business sector R&D expenditure in Gauteng amounted to ZAR 7.1 million, 57.8% of the national business sector R&D. The highest share of business sector R&D in Gauteng (2008-09) was carried out by the electricity, gas and water supply sector (31.6%), followed by financial intermediation, real estate and business services (28.4%). Manufacturing came in third (25.6%) (Table 1.8).

Table 1.8. **Gauteng business expenditure on R&D by SIC code, 2008-09**

SIC classification	ZAR (thousands)	%
10000 Agriculture, hunting, forestry and fishing	33 518	0.5
20000 Mining and quarrying	361 209	5.1
30000 Manufacturing	1 828 150	25.6
Manufacture of food products, beverages and tobacco products	71 948	1.0
Manufacture of textiles, clothing and leather goods	1 134	0.0
Manufacture of wood and products of wood and cork, except furniture Manufacture of articles of straw and plaiting materials Manufacture of paper and paper products Manufacture of publishing, printing and reproduction of recorded material	58 012	0.8
Manufacture of refined petroleum, coke and nuclear fuel Manufacture of chemicals and chemical products (including pharmaceuticals) Manufacture of rubber and plastic products	581 146	8.1
Manufacture of non-metallic mineral products	102 288	1.4
Manufacture of basic metals, fabricated metal products, machinery and equipment Manufacture of office, accounting and computing machinery	138 754	1.9
Manufacture of electrical machinery and apparatus	145 995	2.0
Manufacture of radio, television and communication equipment and apparatus Manufacture of medical, precision and optical instruments, watches and clocks	228 241	3.2
Manufacture of transport equipment	444 079	6.2
Manufacture of furniture, recycling, manufacturing not elsewhere classified	56 555	0.8
40000 Electricity, gas and water supply	2 252 374	31.6
50000 Construction	2 746	0.0
60000 Wholesale and retail	92 148	1.3
70000 Transport, storage and communication	367 810	5.2
80000 Financial intermediation, real estate and business services	2 023 904	28.4
90000 Community, social and personal services	169 551	2.4
Total	7 131 411	100.0

Note: In data collected for this table, a single firm can assign its R&D to several industrial codes according to the R&D performed.

Source: Department of Science and Technology of South Africa (2010), *South African National Survey of Research and Experimental Development (R&D) 2008/9*, Human Sciences Research Council, Pretoria. Conducted by the Centre for Science, Technology and Innovation Indicators (CeSTII) within Human Sciences Research Council (HSRC), compiled in Rumbelow, J. et al. (2010), "Background Report on Innovative Capacity and R&D for Gauteng Region OECD Territorial Review", mimeo.

Though businesses' contribution to R&D is high in Gauteng, the innovative activity of business enterprises does not rest solely on R&D. Various kinds of design, engineering and associated management activities are critically important, and in many firms, it is these resources alone that support innovation and form the base from which more formally organised R&D emerges. Business enterprises are important as creators of human capital for the innovation system, not simply as employers of human resources.

An important locus for the creation of such human resources is in association with imports of technology for large projects and foreign direct investment (FDI).[26]

Though the bulk of R&D is performed by the business sector, public R&D is substantial in Gauteng and includes higher education, national and provincial government departments, public research institutions, museums and science councils. In 2008-09, the total R&D expenditure by the science councils in South Africa amounted to ZAR 3.13 billion, and the portion spent in Gauteng amounted to 61.2% of the national total. The science councils had a total of 1 476.2 researcher FTEs, which is a higher number than the figure recorded for FTE researchers in Gauteng's universities (1 126.5). Though total R&D expenditure in Gauteng's universities rose by 22.7% between 2007 and 2009,[27] the number of FTEs in Gauteng increased only marginally (2.2%) over the same period when compared to the 34.9% increase in FTEs at science councils (Centre for Science, Technology and Innovation, 2010). Recent initiatives point to collaboration between science councils and universities through the establishment of centres of excellence (CoE) based in Gauteng universities (Box 1.4).

Box 1.4. **Centres of excellence in Gauteng: collaboration between universities and public science councils**

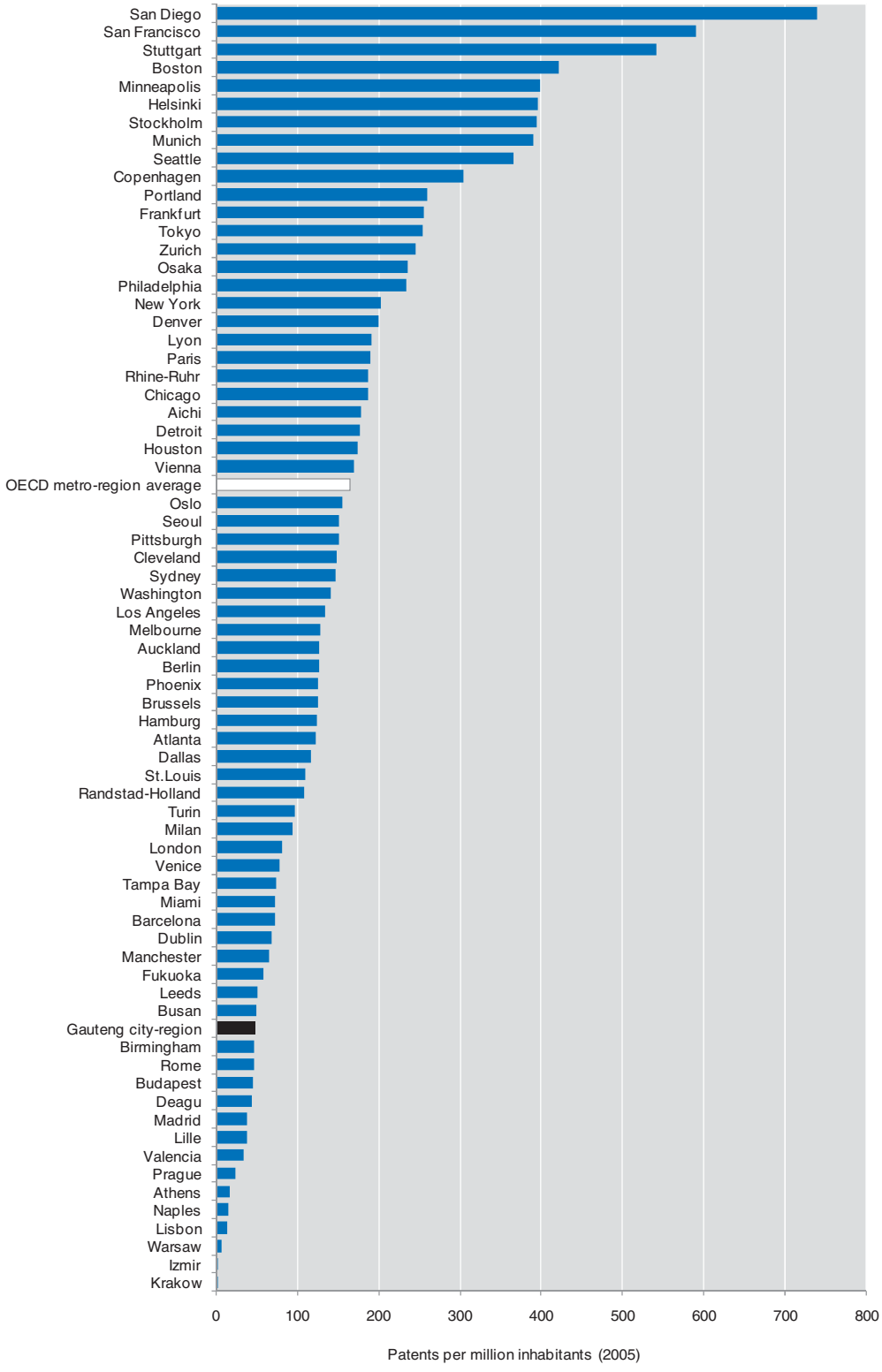
The Department of Science and Technology/National Research Foundation (DST/NRF) Centre of Excellence in Strong Materials (CoE-SM) is a major South African Research Network hosted by the University of the Witwatersrand, in partnership with the Nelson Mandela Metropolitan University, the Universities of Johannesburg, KwaZulu-Natal and Limpopo, the Council for Minerals Technology (Mintek) and the Nuclear Energy Corporation of South Africa (NECSA). The focus of this initiative is to enable researchers to collaborate across disciplines on long-term projects that are locally relevant and internationally competitive. There are more than 30 researchers and over 80 postgraduate students active in the centre from a number of disciplines, including physics, chemistry, ceramics, metallurgy, chemical and mechanical engineering. The focus of the centre is on propulsion, aerostructures, platforms to stimulate the development of breakthrough technologies and concepts enabling step changes in aviation.

The Centre of Excellence in Tree Health Biotechnology (CTHB) at the Forestry and Agricultural Biotechnology Institute (FABI) represents one of seven designated science centres supported by the DST/NRF. CTHB research concentrates on the health of native trees, particularly those in forests, and it has both a national and international perspective. A core focus is to provide the highest possible quality of postgraduate education in fields such as plant pathology, entomology, biochemistry, genetics, molecular biology, biotechnology and ecology.

Source: Gauteng City-Region Observatory (2010), "Background Report for OECD Gauteng Territorial Review", 25 October version.

As a result of the investment in R&D, the Gauteng city-region generated the majority of patents in South Africa (57% in 2004), although it ranks in the bottom quartile of OECD metro-regions. Gauteng's leading patenting sectors were machinery and equipment (171 patents), furniture (60 patents), fabricated metal products (45 patents) and chemicals (39 patents). Gauteng's level of patent applications per million inhabitants stands at approximately 49 patents, placing it in the league of Leeds, Busan, Birmingham, Rome and Budapest (Figure 1.30).

Figure 1.30. **Patents in OECD metro-regions and in the Gauteng city-region, 2005**



Source: *OECD Metropolitan Database*. Data for the Gauteng city-region derives from Lorentzen, J. (2007), "Regional and Local Innovation Systems", unpublished study for the National Advisory Council on Innovation.

Obstacles to innovation in the Gauteng city-region

Given Gauteng's dual position as the innovation hub of South Africa and the host of the largest concentration of informal settlements and impoverished residents in South Africa, the innovation system could better meet the needs of low-income earners. Additional attention could be focused on the needs of small and medium-sized enterprises (SMEs), especially those in low-income and migrant communities. Overall, the innovation system has not adequately addressed a series of items that interface with this Review, namely affordable and environmentally friendly building designs, affordable and adequate public transport, more extensive services, and improved waste management. While it is generally understood that scientific excellence in universities, alongside strong innovative activity in larger firms, is an important basis for vibrant sectors of knowledge-intensive activities operating at the technological frontier, it is less clear how Gauteng's innovation system can contribute to the aims of widespread black economic empowerment and massive expansion of employment, especially for unskilled and semi-skilled workers.

Innovation in South Africa is hampered by low levels of entrepreneurial activity, when compared to both advanced and developing countries. The low level of start-up and survival of firms, particularly SMEs, in South Africa stems from a combination of lack of access to commercial finance, high interest rates and under-developed skills. In particular, the highly concentrated market structure dominated by established businesses tends to be associated with lower output and employment and higher prices in the affected sectors. The Global Entrepreneurship Monitor (GEM), an international survey of business start-up activity, reports that South Africa's total early-stage activity rate was 5.9% in 2009. In other words, 5.9% of South African adults between the ages of 18 and 64 own and manage a start-up business (less than 3.5 years old). This rate compares poorly with Brazil (15.3%), Uganda (33.3%), Peru (20.9%), Algeria (16.7%), China (18.8%), and the average for low- to middle-income countries (14.8%). The prevalence rates for established business owner-managers are particularly disturbing. In terms of established business activity, i.e. the ownership and management of an established business that has survived for more than 3.5 years, South Africa ranked last out of the 54 countries, with an established business rate of only 1.4%. The average for all GEM countries is 7.7% while that for all efficiency-driven countries is 7.9%, almost six times the rate for South Africa (Herrington et al., 2010). Equally disturbing, this number has dropped from a rate of 2.3% in 2008, which "reconfirms that the prognosis for survival and sustainability of early-stage businesses in South Africa remains poor" (Herrington et al., 2010).

Innovation research in South Africa and Gauteng illustrates a growing, though still insufficient and highly domestic number of partnerships and inter-firm linkages. Partnerships often help companies take more significant innovation risks, for example by providing them with an initial customer or a "beta-test partner" for an innovation. The degree to which firms innovate in partnership with other companies is an indicator of the extent to which they are embedded in supply chains. In South Africa, innovators responding to the 2001 survey[28] (Oerlemans et al., 2003), had domestic company partners in only 18% of cases (compared with 26% in the European Union), but had foreign partners in 26%. This reinforces the impression that much technology is acquired from abroad. It suggests scope for increasing the number and quality of inter-firm linkages within as well as outside South Africa (OECD, 2007). The only information available for firms collaborating on the Gauteng city-region level is a sample of 65 R&D performing companies in the *National R&D Survey 2008-09*. The count of firms collaborating with South African partners on R&D indicated that pharmaceutical manufacture (7) and

business and financial services (5) had the highest number of local R&D collaborations, followed by the manufacture of food and beverage products (4). This information, however, is probably not representative of the economic complexity of the Gauteng city-region, given the low sample size.

As perceived by business leaders, the failure of firms to innovate in South Africa stems from a combination of lack of funding, qualified personnel, and a market dominated by established businesses. According to the results of the *National Innovation Survey 2002-04*, 26.2% of all enterprises indicated that developing innovative activities within their enterprises was hampered or restrained because the market was already dominated by established enterprises. The second most cited factor was a lack of funds within the enterprise (25.3%), and the third was that the costs of innovation were perceived to be too high (20.4%) (Table 1.9). The responses to the South African survey are again in some ways stereotypical: small firms are always short of money, though many South African firms may be particularly so. Small firms are normally under pressure and lack the capacity to devote time, funding and staff to urgent projects. However, the lack of capacity suggested by the "shortage of staff" responses points to a need to raise the number and proportion of innovation-capable people in the population of predominantly small firms responding (OECD, 2007).

Table 1.9. **Highly important factors that hampered innovation activities of all enterprises, 2002-04**

(% of enterprises)

	Industry (total)	Services (total)	Total*	Innovative	Non-innovative
Cost factors					
Lack of funds within the enterprise or group	26.0	24.8	25.3	29.1	21.3
Lack of finance from sources outside the enterprise	16.6	14.4	15.4	18.7	11.9
Innovation costs are too high	18.1	22.2	20.4	22.8	17.7
Knowledge factors					
Lack of qualified personnel	16.9	16.9	17.0	20.4	13.2
Lack of information or technology	8.3	1.0	4.3	3.5	5.1
Lack of information of markets	5.2	2.8	3.8	3.3	4.4
Difficulty in finding co-operation partners	11.2	5.6	8.1	4.0	12.5
Market factors					
Market dominated by established enterprises	20.5	30.7	26.2	23.2	29.3
Uncertain demand for innovative goods or services	6.5	12.6	9.9	9.5	10.3
Reasons not to innovate					
No need due to prior innovations	5.1	3.3	4.1	3.0	5.2
No need because of no demand for innovations	4.3	12.9	9.0	0.7	18.0

* The sample size was 2 627 enterprises; the results of the survey were extrapolated to the target business population of 31 456 enterprises based on the weights of 120 strata.

Source: Blankley, W. and C. Moses (2009), *Main Results of the South African Innovation Survey 2005*, HSRC Press, Cape Town.

Large firms have been more effective in accumulating knowledge resources and investing in training than South Africa's smaller firms. A recent study of manufacturing firms in South Africa's Ekurhuleni district found that, compared with small firms, "large and medium firms were much more likely to train, and more likely to use outside training providers". In South Africa, large firms are also the major players in accumulating

knowledge resources through R&D. Drawing on the latest R&D survey, Kahn (2006) has indicated that large firms account for a high proportion of business enterprise R&D: the top 12 R&D performing firms account for 58%, and the top quintile for 86%. Though a significant number of these firms are parts of the economy's resource-based nexus, many develop knowledge bases across a much wider range of technologies than those directly involved in their core production activities. They do so primarily to support the management of their key supply chain interfaces, i.e. those industries from which they purchase inputs of materials, components, assemblies, engineering and other knowledge-intensive services, and capital equipment, and also those to which they sell, or might sell, their products (Patel and Pavitt, 1997; Granstrand et al., 1997; Brusoni et al., 2001; cited in OECD, 2007). This capability stimulates inter-firm interaction in innovation and provides a basis for diversification of the firm's own production activities. Such a dynamic role appears to have been important, for instance, in the emergence of diversified structures of production around resource-based industries in countries like Finland and Sweden, and in the evolution of individual firms into different industries (OECD, 2007).

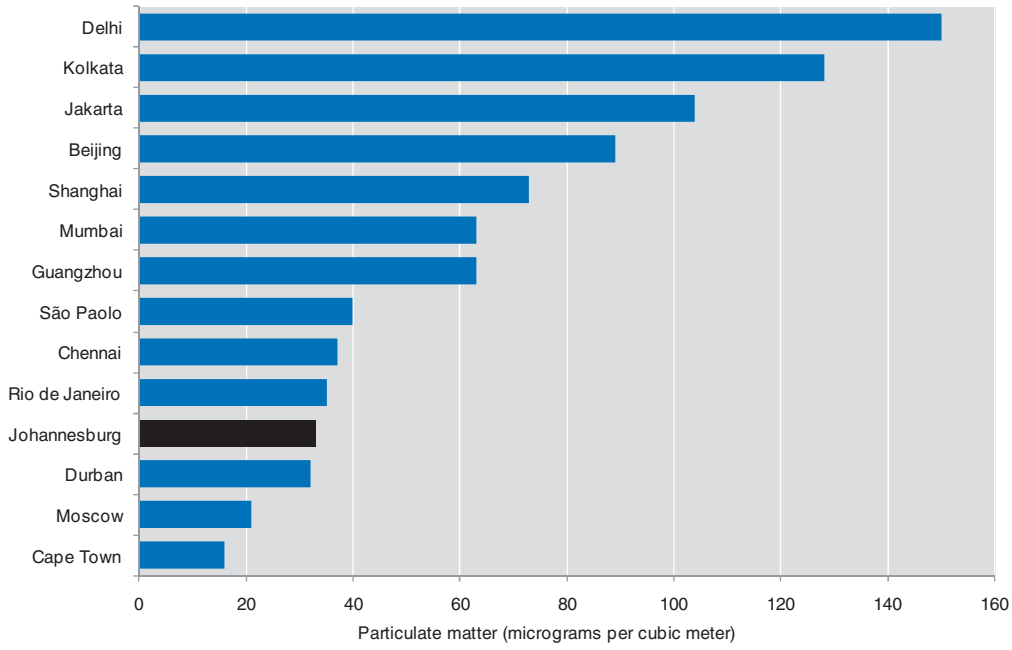
Environmental challenges to economic competitiveness

Gauteng's accelerated population growth, increasing motorisation, sprawling urban growth and legacy of mining have put immense pressure on the environment. Public service systems have struggled to meet increasing demand, resulting in water contamination in some areas, sewage overflows in others and unmanageable levels of waste going to landfills. While the vast majority of households use electricity for cooking, heating and lighting, approximately 5% of household energy usage in the city of Johannesburg is derived from coal (City of Johannesburg, 2008a). This increases greenhouse gas emissions per capita. Urban sprawl due to the fast pace of growth on the city outskirts also contributes to greenhouse gas emissions, particularly because car-related commuting accounts for over 80% of trips. Although the region has made great strides in ensuring high-quality potable water delivery and investing in public transport, four key challenges still threaten economic competitiveness and social development: *i*) air pollution; *ii*) fossil-fuel energy sources; *iii*) surface water contamination; and *iv*) waste disposal.

Air pollution limits economic competitiveness by reducing an area's attractiveness to firms and individuals and imposing high health costs. Upper respiratory problems related to air quality issues have resulted in estimated expenditures of ZAR 280 million per year in Johannesburg (City of Johannesburg, 2008a). Air pollution from vehicle emissions and domestic fuel combustion is a key contributor to respiratory hospitalisations and leukaemia cases in Gauteng (Scorgie et al., 2004 in Gauteng City-Region Observatory, 2010a; Gauteng Provincial Government, 2010). Attractiveness is associated with population growth, firm creation, higher incomes, productivity and wages. Results of an OECD computable general equilibrium model shows that by 2030, cities that could become more attractive will do so while also curbing local pollution (e.g. Ankara, Auckland, Barcelona, Krakow, Lille, Melbourne, Montreal, Monterrey and Toronto). It also highlights that some metropolitan regions risk losing economic attractiveness if their current pollution trends continue (e.g. Chicago, Los Angeles, New York, Osaka, Paris, Philadelphia, Seoul and Tokyo) (OECD, 2010b). Damage to local health also imposes economic costs.

In Gauteng, particulate matter (PM) levels pose a particular threat, as they frequently exceed national and international air quality standards. Particulate matter negatively impacts human health more than most other forms of air pollution and is linked to deaths from cardiovascular disease, respiratory disease and lung cancer (OECD, 2008a). The World Health Organization (WHO) recommends decreasing air pollution targets for particulate matter particles of 10 micrometres or less (PM_{10}), from 70 microgrammes per cubic metre (μ/m^3) to 50μ/m^3 to 30 μ/m^3, to reach the WHO guideline of 20 μ/m^3 for PM_{10} (OECD, 2008a; WHO, 2006). Even though Johannesburg had lower PM_{10} levels (as of 2005) than most major cities in India, Brazil, China and Indonesia, the levels were higher than in Cape Town and in eThekwini, and well exceed international standards in pockets of the Gauteng region (Figure 1.31). In Johannesburg PM_{10} concentrations across the city frequently exceed national air quality standards of 50 μ/m^3, reaching as high as over 400 μ/m^3 (City of Johannesburg, 2008a; Gauteng Provincial Government, 2009d). Across the province, 57% of PM_{10} emissions stem from industrial, commercial and institutional sources, with domestic fuel burning causing 20% of emissions (Spencer et al., 2010). In Soweto, domestic coal combustion has contributed to approximately 70% of the area's PM_{10} levels, and in the Vaal Triangle, it has contributed to approximately 65% of that area's PM_{10} levels in winter, when pollutants stagnate at higher levels due to temperature inversions and calm winds (Gauteng Provincial Government, 2009d; City of Johannesburg, 2008a; Annegarn et al., 1998 and Engelbrecht et al., 1998 in Gauteng City Region Observatory, 2010c; Gauteng Provincial Government, 2010).

Figure 1.31. **Particulate matter (PM_{10}) levels in select BRIICS cities, 2004**



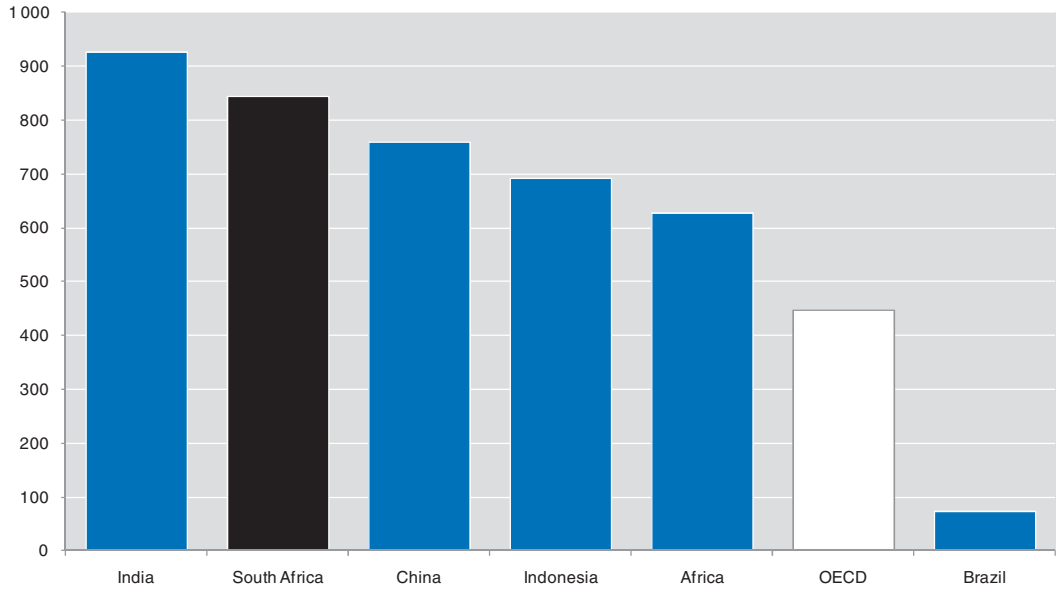
Source: Data on particulate matter concentrations are from Pandey et al. (2006), "Ambient Particulate Matter Concentration in Residential and Pollution Hotspot Areas of World Cities: New Estimates Based on the Global Model of Ambient Particulates (GMAPS)", World Bank, Washington, D.C. These data refer to 2004. Data from Cape Town were sourced from the City of Cape Town Air Quality Monitoring Laboratory and were collected from the City Hall's air monitoring station in 2007; data from Johannesburg were found in City of Johannesburg (2007), *State of the Air Report*, City of Johannesburg Environmental Management, Johannesburg and refer to the 2006 yearly average.

Heavy reliance on energy from fossil fuels in Gauteng contributes to air pollution and the costs of addressing greenhouse gas emissions. Carbon dioxide (CO_2) emissions from energy production are a growing concern for Gauteng, given the region's reliance on fossil fuels for energy production and transport. This reflects the fact that South Africa is the most coal-dependent economy in the world, with coal-driven power stations accounting for about 90% of electricity generation (OECD, 2010a). The largest source of CO_2 emissions in South Africa is electricity generation emissions from coal and oil refining to produce petroleum products, coal mining and gas extraction, and wood, coal and oil combustion for industrial and domestic purposes (Spencer et al., 2010).

Electricity and heat production are also high in CO_2 intensity, compared with most other OECD enhanced engagement countries, African countries overall and the OECD (Figure 1.32). Renewable energy sources currently represent a small share of energy production. In Johannesburg, they represented 0.2% of all energy sources for heating and cooking in 2001, and this share decreased to virtually 0% by 2007. Recently, the City of Johannesburg has committed to powering traffic lights using solar panels, which may stimulate further interest in the use of renewables (City of Johannesburg, 2008a). Likewise, the Gauteng Department of Housing and Local Government has been working with municipalities to evaluate solar heaters installed in homes.

Figure 1.32. **Electricity and heat output in South Africa, OECD enhanced engagement countries, OECD member countries and African countries**

CO_2 emissions per kilowatt/hour, 2007



Note: Data for China includes Hong Kong.

Source: *OECD Stat*.

The cost of potable water provision and sewage treatment is strained by water contamination and unlawful water abstraction in Gauteng. As of 2007, 98% of Gauteng households had access to on-site or off-site piped or tap water and only 1.3% of households did not have access to a toilet facility (Gauteng Provincial Government, 2009e). However, the existing infrastructure struggles to meet the potable

water and wastewater treatment needs of a growing population. Four main factors undermine water quality: *i)* insufficient capacity or treatment ability of many municipal wastewater treatment plants; *ii)* wastewater mixed with storm water, particularly during severe storm events; *iii)* illegal dumping of waste into sewers; and *iv)* overflowing of contaminated water in closed mines. These challenges increase the cost of water treatment and provision. One study found that increased water salinity alone cost households in the Vaal River System approximately ZAR 5 million per month in 2006 (Gauteng Provincial Government, 2009e; South Africa Department of Water Affairs and Forestry, 2007). In addition to contamination, unlawful water abstractions have also put pressure on the need to develop new water sources and upgrade post-purification bulk-supply networks. For example, the Rand Water company, which provides 75% of all bulk potable water to Gauteng municipalities, has announced the need to invest ZAR 2.5 billion over 2007-12 to meet growing water demand (Gauteng Provincial Government, 2009e).

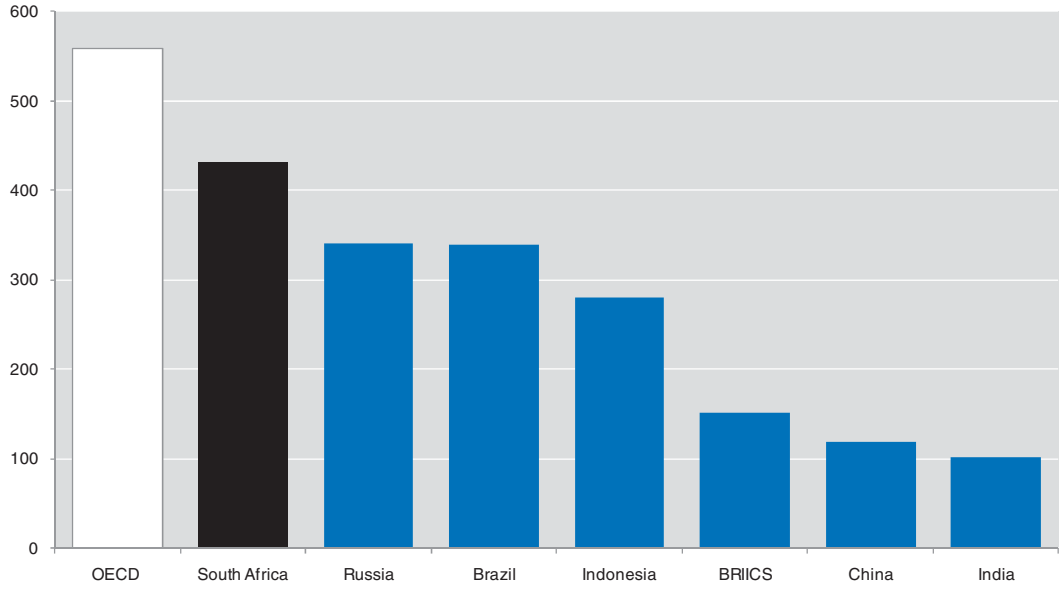
Raw sewage contamination in parts of Gauteng still imposes high human health costs. In particular, the high-density residential areas that are often located in suburban or rural areas face contamination from sewerage systems that are pushed beyond treatment capacity, poorly maintained, or used for inappropriate waste disposal (City of Johannesburg, 2008a). Most watercourses in Johannesburg have unacceptable degrees of bacterial contamination. The highest levels of the bacterium *Escherichia coli* (*E. coli*), associated with the presence of faecal matter, are found in Alexandra, Diepsloot and Soweto and the Jukskei and Klipspruit river systems (City of Johannesburg, 2008a). High levels of faecal coliform are also present in the Pienaar's, Hennops, Suikerbosrand rivers and the Vaal Dam (Gauteng Provincial Government, 2010; Gauteng City-Region Observatory, 2010c). Ingestion of *E. coli* through untreated water or food can cause diarrhoea. While the incidence of diarrhoea in children under five decreased over 1998-2001 in Gauteng, it increased nearly threefold over 2003-05 in the city of Johannesburg and in Gauteng as a whole, reaching 103.5 per 1 000 children in the city of Johannesburg and 93.9 per 1 000 children in Gauteng in 2005 (Gauteng Provincial Government, 2004; City of Johannesburg, 2008a). The health benefits of drinking water quality and sewage treatment are often greater than the costs of policy implementation, even when improvements are made where drinking water quality is already acceptable (OECD, 2008a; Gagnon, 2008; US EPA, 2006).

A large share of waste still goes to landfills in Gauteng, contributing to the region's greenhouse gas emissions. The vast majority of waste is disposed of in landfills: in Johannesburg, 384 kilogrammes per capita went to public landfills in 2007 (City of Johannesburg, 2008a). Landfills produce methane, which has a significantly greater impact on climate change than CO_2 emissions and continues to be released for decades after waste disposal (Intergovernmental Panel on Climate Change, 2007). In comparison, OECD member countries were able to hold methane emissions constant over 1990-2004, while they grew 10% worldwide (OECD, 2008a).

The city of Johannesburg reduced quantities of general waste (not including hazardous or hospital waste) by 4.4% for the period 2003-08 (City of Johannesburg, 2008a). However, while estimated per capita waste generation in Gauteng in 2004 was lower than the average for OECD member countries in 2005 (480 kilogrammes a year compared to 559 kilogrammes/year), it was higher than South Africa as a whole, which itself is the highest among BRIICS countries (Figure 1.33) (OECD, 2008a; Gauteng Provincial Government, 2004).

Figure 1.33. **Municipal waste generation in OECD and BRIICS countries**

Kilogrammes per capita per year



Note: data for OECD member countries are from 2005; data for South Africa are from 2005; data for the Russian Federation are from 2004-05; data for Brazil are from 2004-05; data for Indonesia are from 1995; data for BRIICS countries are from 2001; data for China are from 2004; data for India are from 2005.

Source: Blottnitz, von H. (2005), "Solid Waste", background briefing paper for the National Sustainable Development Strategy, University of Cape Town, South Africa; Federal Statistical Service of Russia (2006), *Main Environmental Indicators*, Statistical Bulletin (in Russian), Moscow; IBGE (Brazilian Institute of Geography and Statistics) (2004), *PNSB 2000* (National Survey of Basic Sanitation in 2000), information received in January 2007 from IBGE; Kumar, S. (2005), *Municipal Solid Waste Management in India: Present Practices and Future Challenge*, Asian Development Bank, Manila; OECD (1999), *OECD Environmental Performance Reviews: Russian Federation*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264180116-en*; OECD (2007), *Environmental Performance Review of China 2007*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264031166-en*; OECD (2008a), *Environmental Outlook to 2030*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264040519-en*; PRB (Population Reference Bureau) (2005), 2005 *World Population Data Sheet*, Population Reference Bureau, Washington, D.C.; Statistics South Africa (2005), *Non-Financial Census of Municipalities for the Year Ended*, Statistical Release P9115, 30 June, Statistics South Africa, Pretoria, *www.statssa.gov.za*; UNEP (2007), *Global Environment Outlook 4*, United Nations Environment Programme, Nairobi; World Bank (1999), *What a Waste: Solid Waste Management in Asia*, Urban Development Sector Unit, East Asia and Pacific Region, World Bank, Washington, D.C.

1.3. Multiple dimensions of inequality

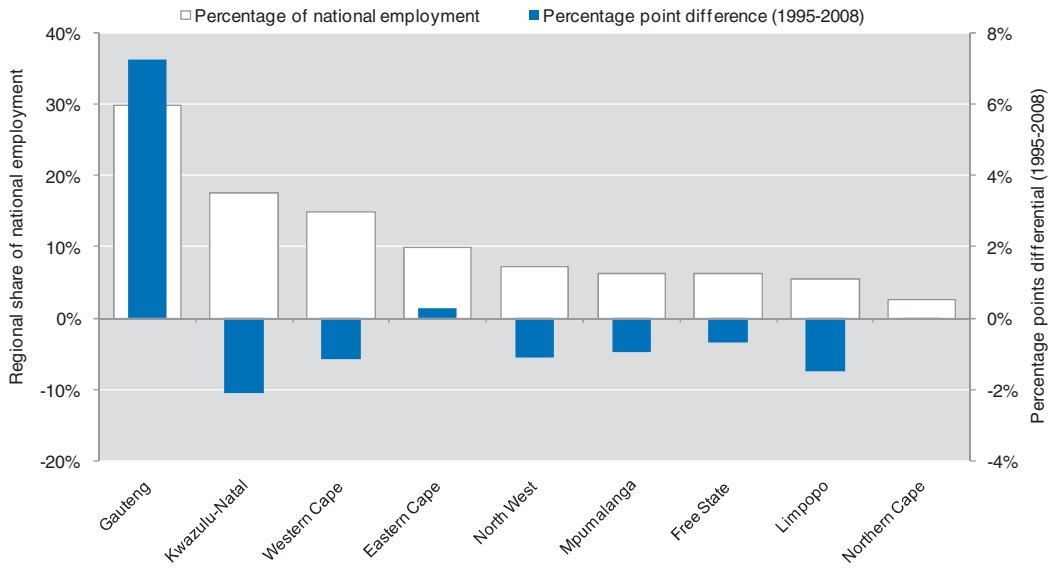
Unemployment disparities and economic exclusion

One of the most pressing issues in South Africa is massive unemployment. According to official data, South Africa has a situation of chronic mass unemployment on a scale rarely found anywhere in the world, and certainly not for a prolonged period. South Africa's extraordinarily high unemployment co-existed with a "jobs miracle" between the turn of the century and the onset of the global financial crisis in 2008. According to the *Provincial Economic Review and Outlook 2009* (Gauteng Provincial

Government, 2009a), total employment in Gauteng rose by 47% between 2001 and 2008, and in the whole country, employment rose by 26% – remarkable growth by historical and international standards. Already, 30% of all jobs in South Africa are located in Gauteng, a share that has grown 7% since 1995 (Figure 1.34). Despite this job creation, in South Africa at least one person in four is unemployed. This unemployment rate is the highest when compared with OECD member countries (Figure 1.35). The OECD average unemployment rate stood at 8.5% in 2010, more than 15% lower than in South Africa (24%). Across OECD member countries, Spain and Estonia have the highest unemployment rates (20.1% and 16.9% respectively), while Norway has the lowest rate (3.6%). Gauteng's official unemployment rate also fell over the 1995-2008 period, but was still above 20%, according to the so-called "narrow definition" (Box 1.5), before the impact of the financial crisis.[29]

Figure 1.34. **Employment in South African provinces**

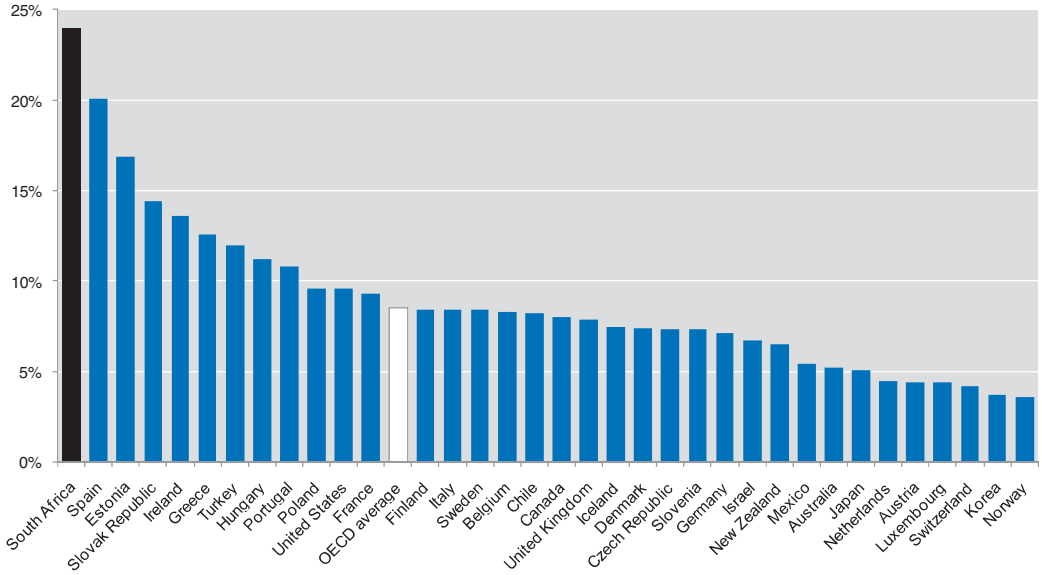
Share of national formal employment, 1995-2008



Source: OECD calculations based on data from Quantec.

Caution is warranted when interpreting unemployment data in Gauteng. The official definition of unemployment in South Africa, i.e. having not searched for work during the past four weeks and being unavailable for such work within one week, differs from other approaches that define "actively seeking" work as having searched in the previous week. If the one-week cut-off were taken, a proportion of the supposedly active unemployed would be excluded from the unemployment count. This is the norm in many other countries, though the International Conference of Labour Statisticians has yet to specify an official length of the job search period.

Figure 1.35. **Unemployment rate in South Africa and OECD member countries, 2010**



Notes: Data for South Africa refer to Q4 2010.

Source: Data for South Africa are taken from Statistics South Africa (2011), *Quarterly Labour Force Survey*, Q1, 2011. Data for all other countries come from *OECD.stat* and thus are not necessarily comparable.

Box 1.5. **South Africa's broad and narrow definitions of unemployment**

Following the definition used by the International Labour Organisation (ILO), South Africa's official (narrow) definition of unemployment classifies individuals as being unemployed if they "(a) did not work during the seven days prior to the interview, (b) want to work and are available to start work within a week of the interview, and (c) have taken active steps to look for work or to start some form of self-employment in the four weeks prior to the interview" (Statistics South Africa, 1999). This places the burden of proof upon non-employed individuals, who must demonstrate that they have made some attempt at finding or creating a job for themselves.

The expanded (broad) definition of unemployment, on the other hand, does not include criterion (c). Although the narrow definition is the official definition in South Africa, the evidence suggests that the broad definition is better able to accurately identify the unemployed in countries like South Africa, where unemployment rates are very high and many individuals give up looking for work, becoming what is termed "discouraged workers". Thus, most of the analysis in this *Territorial Review* uses the expanded definition of unemployment. Simply stated, subjects who have not worked in the last week but want to work and would, if offered a job, be able to start working within a week, are classified as unemployed, according to the expanded definition.

Source: Statistics South Africa (1999), "Census in Brief", Statistics South Africa, *www.statssa.gov.za/census01/census96/HTML/CIB/census_in_brief.htm*.

It is possible that unemployment figures are overestimating real rates given the sizable share of under-recorded migration and other recording issues. First, there is systematic under-recording of all forms of migration, particularly immigration from neighbouring countries in the Southern African Development Community (SADC). There are no reliable figures on Gauteng's foreign-born population. Estimates vary wildly, from millions to hundreds of thousands; but there is consensus that the political turmoil in neighbouring Zimbabwe has driven many to seek work in South Africa, and mainly in Gauteng; building on the historical trend for migrants to enter the country from Mozambique, Lesotho and elsewhere. Most of these migrants have to survive through selling labour or indulging in petty economic activities. South Africa's primary employment survey instrument, the *Quarterly Labour Force Survey* (QLFS), is a household survey based on dwellings sampled within some 3 080 primary sample units across the country. In theory, therefore, it should not discriminate as to whether the sampled dwelling is occupied by a foreign-born or South African household. However, the survey response rates in Gauteng are relatively low, at 82% compared to 92% for the country as a whole. It is not impossible that the non-response rate is due to the unwillingness of foreign migrants to be interviewed or to claim that they are not employed for fear of censure. Such migrants may be technically "employed" but statistically invisible, meaning that the level of employment is underestimated and the unemployment rate is correspondingly overestimated.

A second aspect is that official statistics tend to correlate subsistence work with unemployment, contrary to conventional labour force statistics as used around the world. The *Quarterly Labour Force Survey* counts as employed "any person aged 15-64 years who, during the reference week: did any work for at least one hour; or had a job or business but were not at work (temporarily absent)". Informal employment would therefore be captured. However, the QLFS distinguishes between two types of economic activity: *i)* market production activities (work done for others and usually associated with pay or profit); and *ii)* non-market production activities (work done for the benefit of the household, e.g. subsistence farming)". Persons working in market production activities are counted as employed; those working in non-market activities are not. Official statistics from the *Quarterly Labour Survey* report a very large number of adults have "never worked". In the fourth quarter of 2010, 46.6% of those unemployed in the Gauteng city-region reported never having worked.[30] Likewise, 47.5% of discouraged seekers of work reported never having worked (Statistics South Africa, 2010). This work never done is supposed to cover "formal work for salary, wage, profit or unpaid in family business; informal work such as making things for sale, selling things or providing a service; work on a farm or land, whether for a wage or as part of the household's farming activities; casual/seasonal work". Nowhere else in the world are so many people recorded as never having worked many years after they left school. According to the September 2006 *Labour Force Survey* (LFS), 13.5% of those who claimed that they had never worked in South Africa subsequently reported in a later question that they had done some subsistence farming in the previous 12 months.[31] However, this discrepancy may be less of an issue in Gauteng itself and if the time period were shortened. If the time period shifts to the last week rather than the last 12 months, the share dramatically decreases. According to the *Quarterly Labour Force Survey* (Q4, 2010), a mere 0.1% of the unemployed in Gauteng reported that they had performed non-market activities in the last week. This is probably higher outside Gauteng, however, given the city-region's low percentage (4.3%) of workers involved in subsistence farming.[32]

Improvements could be made to South Africa's *Labour Force Survey* to improve accuracy, compliance with international standards, and clarification over those "actively seeking" employment. Though there has been tremendous improvement in the collection and availability of labour market data in the post-apartheid period, serious gaps and problems bear consideration in order to improve future data collection. Improving the evidence base can have high returns: policy research can be more reliable. First, reliability is compromised by the inconsistent reference points used in the *Labour Force Survey* (LFS). It asks whether the person has done income-earning work over the past one week, job-seeking over the past four weeks and is available to start work in the next two weeks. Given the extensive flexibility of labour practices, a better combination would be to ask if a person had been doing any work over the past two weeks, and if not, whether they had been looking for work over the past two weeks, and if they were to find a job, whether they could start within the next two weeks. (Box 1.6).[33]

Box 1.6. **Data constraints in labour market analysis in South Africa**

A major difficulty in analysing South Africa's labour market performance (and indeed some other aspects of the economy) since the early 1990s is that no single consistent data source covers the entire period. One principal source of labour market data, the *October Household Survey* (OHS), began in 1995, a year after the transition to democracy, and ended in 1999. Its successor was the *General Household Survey*, which started in 2002. The *Labour Force Survey* (LFS), conducted in March and September of each year, began in 2000 and was replaced by the *Quarterly Labour Force Survey* in 2008. Censuses are typically conducted every five years (although none was made in 2006), but the pre-democracy censuses are not fully comparable with the post-apartheid ones, and data exist for only two of the latter so far, 1996 and 2001. There have also been surveys of employers: the *Survey of Employment and Earnings*, discontinued in 2005, and the *Survey of Quarterly Employment*, which replaced it. The latter two provide measures only of formal sector non-agricultural employment, however, and these partial data tend to systematically underestimate overall employment growth.

A particular problem pertains to the year 2000, the first year of the LFS. An initial LFS (with a restricted sample) was conducted in February 2000, with a second in September/October. Of the measured employment growth of 3.08 million over the 12-year period between October 1995 and September 2007, nearly half, 1.51 million, occurs in the 4-month interval between October 1999 and February 2000, when the changeover from the OHS to LFS took place. It is not clear why such a sudden surge in employment would have taken place at that time. There was relatively strong real GDP growth (4.2%) in the year 2000 relative to previous years, though still only at about potential, and the LFS for September of that year actually shows slightly lower employment than in February. One statistical factor known to be at play is the improvement in coverage of employees in the informal sector. If all of the measured increase from October 1999 to February 2000 were an artefact of the statistical shift from the OHS to the LFS, then employment growth during 1995-2007 would not have been 2.2% a year but 1.2%. Probably the true value falls between the two, especially since 1995 also looks somewhat anomalous, giving rise to an 8.5% drop in employment between 1995 and 1996. The 1995 estimate uses weights derived from the 1991 Census. If weights from the 1996 Census are used instead, total employment in 1995 would be about 9.5 million, resulting in a smoother and more plausible trend over the period 1995-99.

Box 1.6. **Data constraints in labour market analysis in South Africa** *(cont'd)*

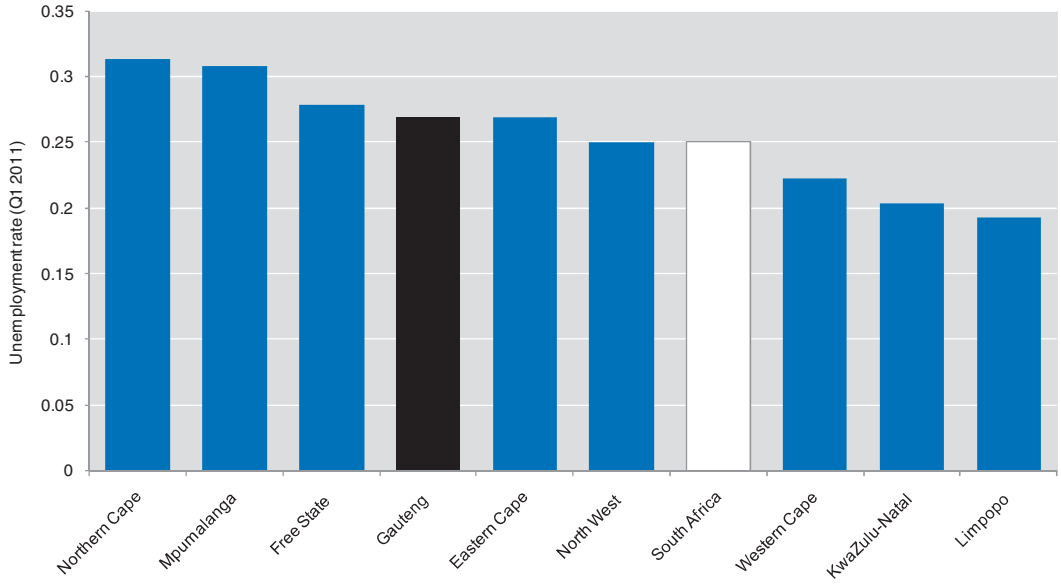
Another important problem is the absence of a reliable time series for wage data. Both the OHS and the LFS only classified earnings in ranges, preventing the calculation of precise averages. And the 2000 discontinuity problem is again marked for wages, which are shown as dropping 38% in real terms between October 1999 to February 2000, then more than doubling between February and September 2000, before falling back almost to the same level in the following March. The September 2000 figures seem to have been affected by a problem of outliers, which probably reflects misrecording (Burger and Yu, 2007), but overall, the picture that emerges from the OHS/LFS interface is that the latter captured a large number of low-paid, especially informal sector, workers (as well as unemployed individuals) not included in the former. While the October *Household Surveys* collect information on earnings and incomes, the data are collected in a somewhat different form from year to year, and this undermines reliable over-time comparisons. For instance, certain *October Household Surveys* ask for earnings information in a continuous form, some allow for a mixture of continuous and categorical responses. The *Labour Force Survey* of September 2003 does not ask an earnings question separately for the self-employed, while other surveys do. It would assist future analysis of labour market trends if good practices – learned on the basis of data collection experience – are consistently applied in future labour force surveys.

Source: Burger, R. and D. Yu (2007), "Wage Trends in Post-Apartheid South Africa: Constructing an Earnings Series from Household Survey Data", *DPRU Working Paper 07/117*, Development Policy Research Unit, University of Cape Town, Cape Town, February; OECD (2008), *OECD Economic Surveys: South Africa 2008*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/eco_surveys-zaf-2008-en*; Kingdon, G. and J. Knight (2005), "Unemployment in South Africa, 1995-2003: Causes, Problems and Policies", *Global Poverty Research Group Working Paper*, No. 010

Gauteng is not only one of the provinces with the highest unemployment rates in South Africa (26.9%) in 2011 (Q1), but it also experiences the highest across OECD metro-regions, an issue which the economic crisis has only amplified. At 26.9%, the Gauteng city-region's unemployment rate ranked as one of the highest in South Africa at the end of 2010 (Figure 1.36), and stood as the largest among metro-regions in the OECD (Figure 1.36). The region did, however, see significant improvement over the years of strong economic growth between 2004 and late 2008. Unemployment peaked in the first quarter of 2003 at 31.9%, and then steadily declined to 20.7% in the fourth quarter of 2008.

The Gauteng city-region's economy has recently suffered from extensive job losses: in 2009, this included the loss of approximately 1 million jobs. In the year to September 2009, according to official figures, Gauteng lost 344 000 jobs, and the labour force participation rate (for those aged 15-64) declined from 73% to 70%. Meanwhile, the number of economically inactive individuals increased from 1.9 million to 2.1 million and the number of "discouraged" (no longer actively seeking jobs) increased from 156 000 to 187 000. This is consistent with the economic recession. Real GDP began falling in the fourth quarter of 2008 and declined for three quarters. Output declined by 1.8% in 2009, marking the first negative annual growth rate in the post-apartheid era. Moreover, the change in the growth rate of real GDP in Gauteng between 2008 and 2009 was the largest single-year slowdown on record for South Africa, and eclipsed the rates in most advanced and emerging economies, though it was far from being the worst (OECD, 2010a). From 2007 to 2010, income and employment in Johannesburg contracted by -3.7% and -4.8%, respectively. Out of 150 cities monitored by the Brookings Institute, Johannesburg ranked 116 (Brookings Institute, 2010).

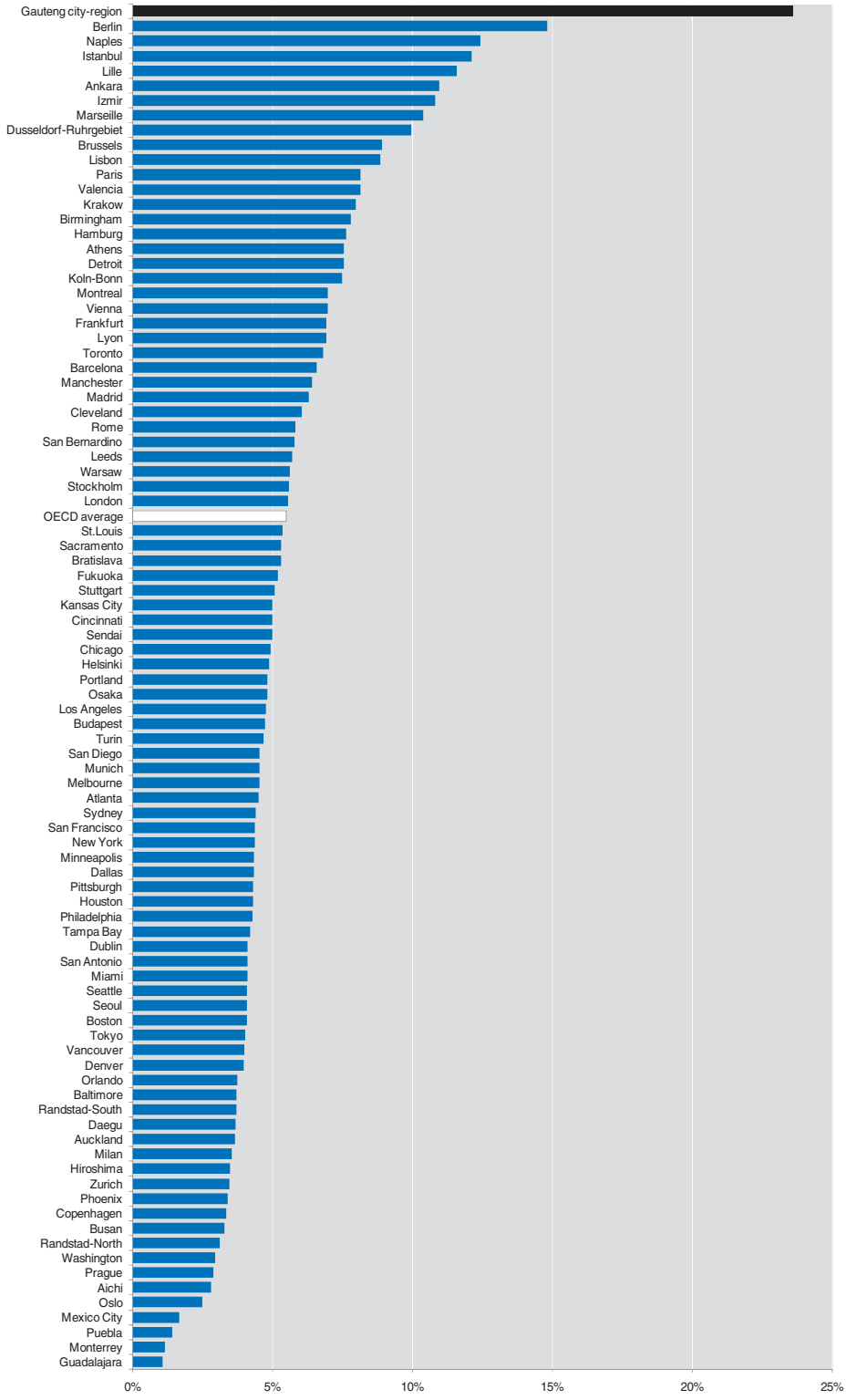
Figure 1.36. **Unemployment rates in South Africa by province, 2011**



Source: Statistics South Africa (2011), *Quarterly Labour Force Survey*, Q1 2011, Statistics South Africa, Pretoria.

Unemployment is not equally distributed across space, race, and gender in the Gauteng city-region. In 2008, Sedibeng municipality scored the highest unemployment rate (30.0%), followed by Ekurhuleni (25.8%), West Rand (22.8%), Johannesburg (20.3%), Tshwane (12.6%) and Metsweding (12.6%) (IHS Global Insight, 2009, cited in Gauteng Provincial Government, 2010). Part of the reason why Sedibeng and Ekurhuleni have such high unemployment rates is their reliance on manufacturing and trade. In Gauteng, the trade and manufacturing sectors lost 110 000 jobs and 102 000 jobs, respectively, between the first quarter of 2008 and the second quarter of 2010 (Statistics South Africa QLFS surveys, 2008-10). The unemployed population is primarily Black African: 85.7% of the unemployed are Black Africans, followed by 10.0% for coloured, 2.8% for whites and 1.5% for those of Indian/Asian descent (Statistics South Africa, 2011). Although women participate actively in the labour market, employment prospects remain biased towards men. Both formal and informal sector employment was dominated by males, who made up 57.7% of the employed workforce, compared to 42.3% females. This trend is also found in OECD member countries; men represent 56.6% of the total employment in all OECD member countries and women represent 43.4% of the workforce (2008).

Figure 1.37. **Unemployment rate in OECD metro-regions and in the Gauteng city-region, 2007**



Note: Denmark (2008), Ireland, Korea and Switzerland (2006), Mexico and Turkey (2000).

Source: *OECD Metropolitan Database* and Quantec.

Related to inequality, an increasing proportion of all those economically active are involved in insecure or precarious relationships, doing casual or temporary labour, working from time to time through temporary employment services (TES) and often reliant on labour brokers. According to Adcorp, a private employment services firm, the level of "permanent" employment was lower in 2008, before the impact of the financial shock was felt, than in 2000, and by 2010 it was much lower, having slumped dramatically through 2009 and early 2010 (Adcorp, 2010).[34] Subcontracted workers in the gold mines have been paid much less than standard employees, while their tenuous contracts leave them vulnerable to loss of jobs at very short notice (Crush et al., 2001; Bezuidenhout, 2006; Department of Labour of the Republic of South Africa, 2009).[35] In addition, although data does not exist that indicate how prevalent labour broking is, this sort of practice may be a daily reality in the informalised, flexible labour market that has emerged in the Gauteng city-region. No doubt many migrants are so desperate that they have to take a risk in supplying their labour to brokers, and no doubt some of them can say in truth that they were actually paid. The gradual drift away from what is called the "standard employment relationship" (SER) has been accompanied by the erosion of labour market social and economic security. Comparative data from the OECD Indicators on Employment Protection display particularly low levels for regulation on temporary forms of employment and specific requirements for collective dismissal (Table 1.10). According to this methodology, South African workers rank as the 5th least protected workers of the 40 countries for which data is available. These data were reinforced by the Socio-Economic Security Programme of the International Labour Organization (ILO), which highlighted the low labour market security, skills security and income security of South African workers.[36]

Gauteng's unemployment dynamics may be affected by a spatial mismatch between locations of employment and residences. The spatial mismatch hypothesis points at disadvantaged population groups' tendency to obtain less employment opportunities and lower incomes when they are located distant from employment opportunities (Zenou, 2009). There are a number of mechanisms that can produce a spatial mismatch. Gobillon et al. (2007) argue that these mechanisms include: long commuting reduces propensity of workers to work in employment clusters; distance to job centres aggravates job search efficiency; job-search intensity decreases with distance from job centres as housing prices decreases and eases pressure in family incomes; high search costs faced by workers force them to look in the vicinity; residence discrimination faced by residentially segregated workers; employers may refuse to hire or would pay lower wages to workers who have long commuting as that renders them more tired and less productive; and racial discrimination. Alternative factors contribute depending on the country context. For the United States, Anil (2008) found that mobility is reduced by local social capital and age. In the case of Gauteng, evidence in Figure 1.38 suggests that a greater spatial mismatch can be found in the municipalities located outside the Johannesburg-Tshwane corridor. Overwhelmingly, those are also the municipalities where lower-income residents are located. Most of the places where lower-income concentrations (dots in Figure 1.38) can be found are actually located within those municipalities with a greater spatial mismatch (illustrated in dark blue in Figure 1.38). That is, lower-income people reside in places where few job opportunities are being generated.

Table 1.10. **Employment protection in OECD member and selected non-member countries, 2008**

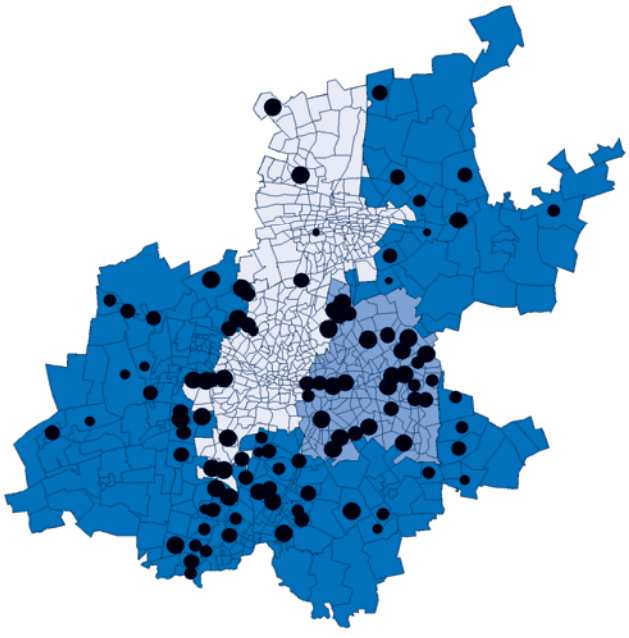
Ranking	Country	Protection of permanent workers against (individual) dismissal	Regulation on temporary forms of employment	Specific requirements for collective dismissal	OECD employment protection index
1	Turkey	2.48	4.88	2.38	3.46
2	Luxembourg	2.68	3.92	3.88	3.39
3	Mexico	2.25	4.00	3.75	3.23
4	Spain	2.38	3.83	3.13	3.11
5	Indonesia	4.29	2.96	0	3.02
6	France	2.60	3.75	2.13	3.00
7	Greece	2.28	3.54	3.25	2.97
8	Portugal	3.51	2.54	1.88	2.84
9	China	3.31	2.21	3.0	2.80
10	Slovenia	2.98	2.50	2.88	2.76
11	Norway	2.20	3.00	2.88	2.65
12	Germany	2.85	1.96	3.75	2.63
13	India	3.65	2.67	0	2.63
14	Belgium	1.94	2.67	4.13	2.61
15	Italy	1.69	2.54	4.88	2.58
16	Austria	2.19	2.29	3.25	2.41
17	Poland	2.01	2.33	3.63	2.41
18	Estonia	2.27	2.17	3.25	2.39
19	Czech Republic	3.00	1.71	2.13	2.32
20	Finland	2.38	2.17	2.38	2.29
21	Brazil	1.49	3.96	0	2.27
22	Netherlands	2.73	1.42	3.00	2.23
23	Korea	2.29	2.08	1.88	2.13
24	Slovak Republic	2.45	1.17	3.75	2.13
25	Hungary	1.82	2.08	2.88	2.11
26	Iceland	2.12	1.54	3.5	2.11
27	Sweden	2.72	0.71	3.75	2.06
28	Chile	2.59	2.04	0	1.93
29	Denmark	1.53	1.79	3.13	1.91
30	Israel*	2.19	1.58	1.88	1.88
31	Russian Federation	2.79	0.79	1.88	1.80
32	Switzerland	1.19	1.50	3.88	1.77
33	Japan	2.05	1.50	1.50	1.73
34	Ireland	1.67	0.71	2.38	1.39
35	Australia	1.37	0.79	2.88	1.38
36	**South Africa**	**1.91**	**0.58**	**1.88**	**1.35**
37	New Zealand	1.54	1.08	0.38	1.16
38	United Kingdom	1.17	0.29	2.88	1.09
39	Canada	1.17	0.22	2.63	1.02
40	United States	0.56	0.33	2.88	0.85

Notes: The scale for each indicator is from 0 to 6, with higher scores representing stricter regulation. For each country, employment protection is described along 21 basic items that can be classified in three main areas which comprise the columns above. For France and Portugal, data refer to 2009. For full details on the methodology and weights used to compile the OECD Employment Protection Indicators, see *www.oecd.org/dataoecd/24/40/42740190.pdf*. Data for Israel are supplied by and under the responsibility of the Israeli authorities. Their use by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Source: OECD Indicators on Employment Protection (2008), *www.oecd.org/dataoecd/42/4/42768860.xls*, OECD, Paris.

Figure 1.38. **Gauteng's spatial mismatch**

Employment and income shares mismatch by municipality
and location of lower income households



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map. $SM = ½ \Sigma | (Income_i/Income) – (Employment_i/Employment)|$ Define Income i as the income in transport zone i (where i=(1,…,n) and indexes the transport zones in a given municipality), Employment *i* as the number of employed people in transport zone *i*, Income as the total income in the municipality, and Employment as the total number of employees in the municipality. This index ranges between 0 (perfect balance) and 1 (perfect imbalance). Dark blue highlights municipalities with a greater spatial mismatch and light blue highlights municipalities with a lower spatial mismatch. Circles are transport zones with average household income lower than the poverty line (lower than ZAR 1 400).

Source: OECD calculations based on Gauteng Department of Roads and Transport (2006), *Gauteng Transport Study 2000*, Gauteng Provincial Government, Johannesburg.

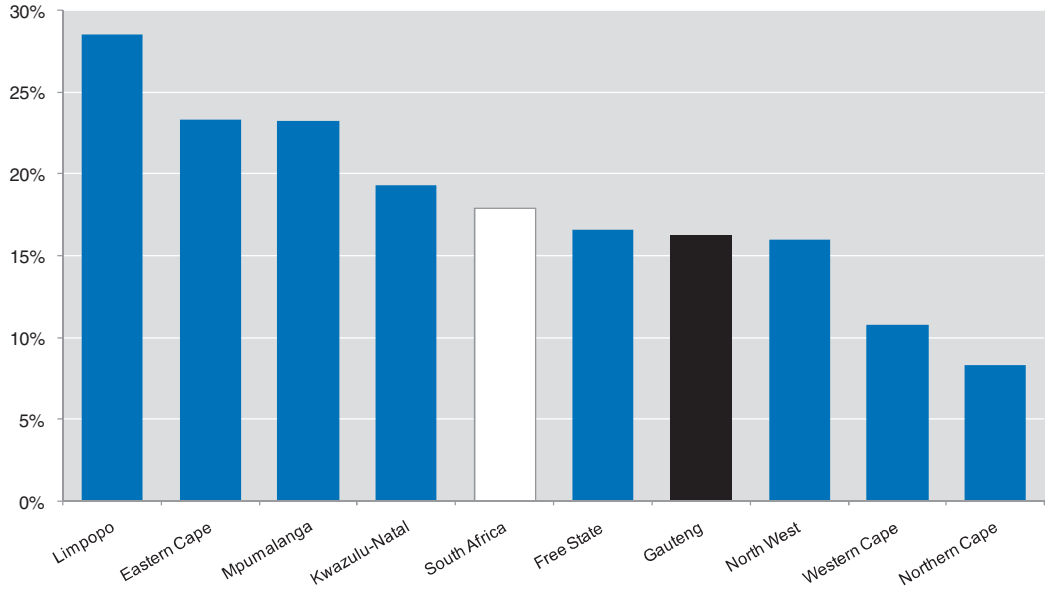
Though apartheid spatial planning may have contributed to the "spatial mismatch", the evidence of spatial mismatches outside South Africa suggests that other contributing factors may be at play.[37] In Gauteng, workers living outside the main central business districts (CBD) in Johannesburg and Pretoria will have an incentive to seize higher wages paid there instead of taking a job in suburban business districts (SBD) or being unemployed. High and persistent unemployment rates – even if some progress has been made – in Gauteng might be the product of skills mismatch between those of workers in the rest of the province and those demanded in the CBD. In addition, some workers might be discouraged from taking a job in the CBD if inadequate or at best, costly or time-consuming commuting is involved. Therefore, the key elements of a spatial mismatch in Gauteng are access to adequate transport, training to upgrade skills and an SME policy to bring jobs to people and reduce the need for long commutes.

While informal employment has been growing rapidly in South Africa, the levels remain low compared with the levels registered in developing countries (Rodrik, 2008). According to Statistics South Africa's definition of informal employment,[38] in 2008,

around 18% of total employment in South Africa were jobs in the informal sector, but the figure ranges widely by sector: wholesale and retail trade sector had the largest share of individuals working in the informal economy (47%), followed by the construction sector (13%) and community, social and personal services (10%) (Figure 1.39). Gauteng's informal share of total employment in 2008 stood at a lower level than the national share (around 12%). These rates are significantly lower than those that can be found by self-employment informal work in sub-Saharan Africa excluding South Africa, standing at 81% of total employment, or 62% for Northern Africa (World Bank, 2004). The South African informal sector also seems smaller as a proportion of total employment when compared with Latin America (60%) or Asia (59%). However, a number of issues, for example formal job creation not keeping up with population growth; economic deregulation creating incentives for informal employment, and a sectoral shift from labour-intensive primary activities to capital-intensive manufacturing, as in the case of Gauteng, have all contributed to rapid informal employment growth in South Africa. The informal economy of South Africa has grown so fast as to more than double in size between 1997 and 2005, while at the same time, semi-skilled and unskilled jobs have shrunk since the late 1980s (Blaauw, 2005).

Figure 1.39. **Proportion of informal employment by province, 2008**

Informal employment/total employment (formal + informal)



Source: Quantec.

Evidence suggests that Gauteng's labour shift between formal and informal work and may often be active in both economies simultaneously. Though the official statistics probably undercount informal labour,[39] local-based research projects have produced data that suggest a wide range of survival strategies. For example, in six informal settlement areas in Soweto,[40] a large residential community in Johannesburg, it was found that 58% of the workers were neither officially employed nor unemployed in 2008. One-third of this group had other employers (both firms and households), while the rest were self-employed casual workers (e.g. part-time manufacturers or shelf-stockers) and those who could be working but were currently inactive (retirees and full-time students)

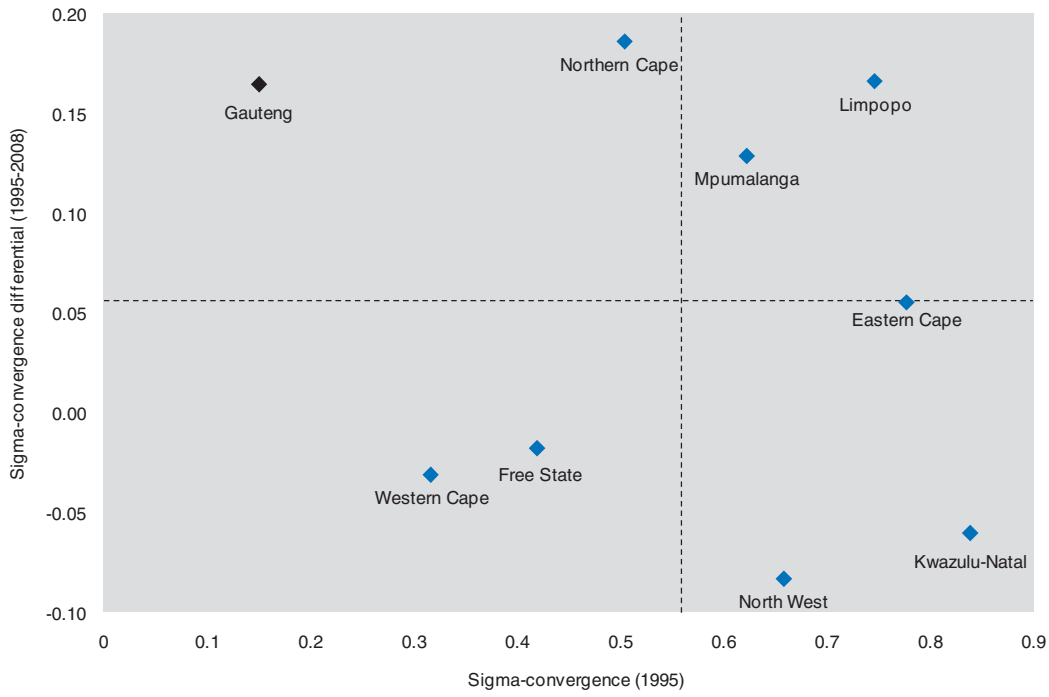
(Grant, 2010). Residents secure income through a large range of activities, including full-time and part-time work, casual work, self-employment, contributions from people in the person's household, remittances or contributions from people not staying in the person's household, gardening or livestock, and social grants or pensions.

A highly skewed distribution of income and poverty, with differences across racial lines

Income inequalities within municipalities in the Gauteng city-region are among the lowest in South Africa, but they are growing fast. One way of measuring spatial inequality is by looking at the regional per capita GDP gap. Using values of per capita GDP as proxies for income levels across provinces can show the width of per capita GDP dispersion by calculating the Sigma-convergence – showing the standard deviation of log per capita values. With around 0.16 in the Sigma-convergence indicator, Gauteng is among the most equal provinces in South Africa. Yet from 1995 to 2008, the rise in intra-municipal disparities in Gauteng was one of the highest in the country, along with Northern Cape and Limpopo (Figure 1.40). Sigma-convergence values doubled between 2004 and 2008. Despite such growth in inequality within the Gauteng city-region, its levels are common to an average metro-region in the OECD. Metro-regions in the OECD such as Warsaw, London, Budapest, Paris, Busan, Tokyo or Dublin show higher intra-regional inequalities than Gauteng (Figure 1.41).

Figure 1.40. **Intra-regional inequality in South African provinces, 1995-2008**

Sigma-convergence within provinces using provincial per capita GDP

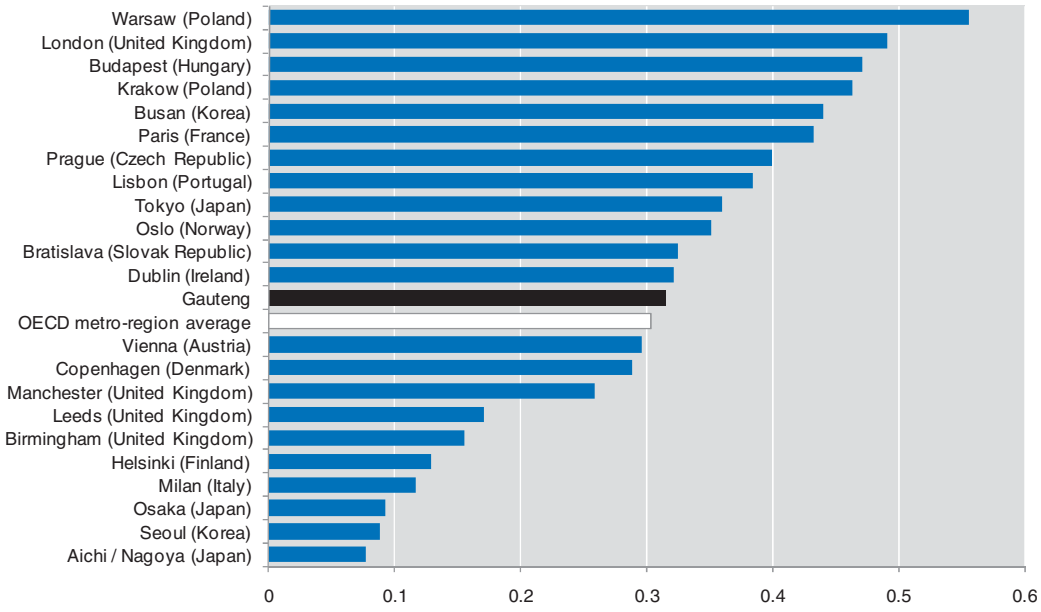


Notes: Sigma-convergence based on per capita GDP values at municipal level. Discontinuous lines refer to average. The Sigma-convergence indicator is calculated using a standard deviation of logged values for the regions in a country.

Source: OECD calculations based on Quantec data.

Figure 1.41. **Intra-regional inequality in the Gauteng city-region and a sample of OECD metro-regions, 2008**

GVA per capita



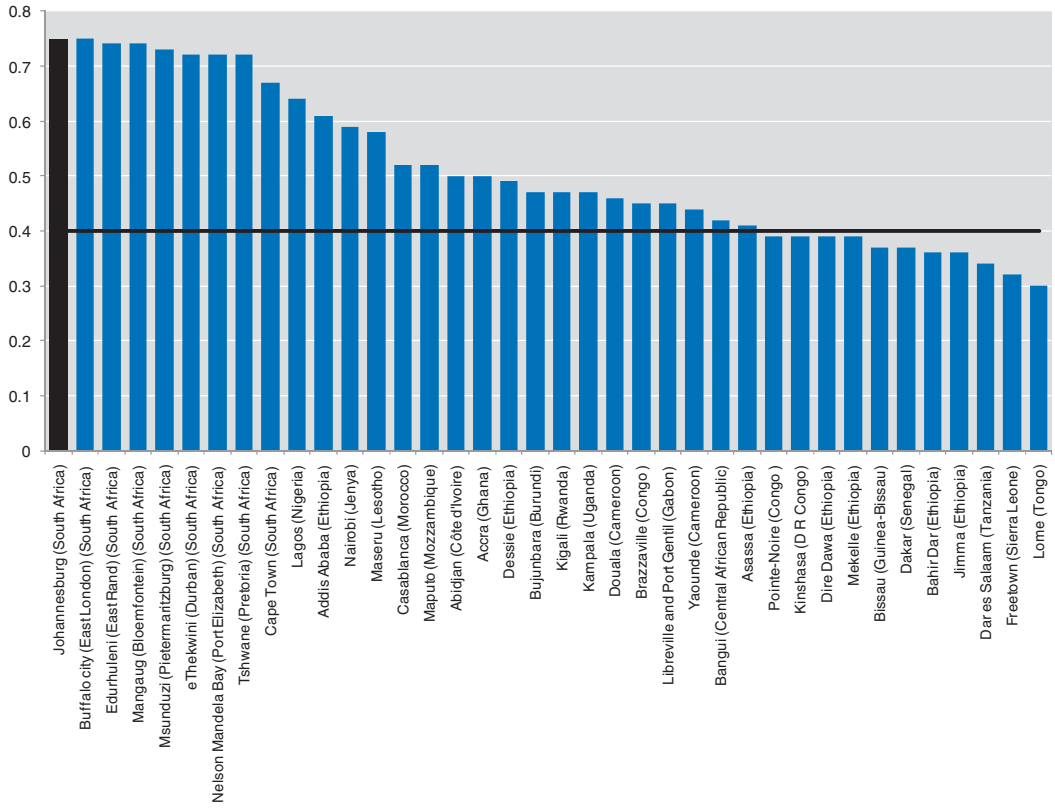
Note: OECD metro-region data refer to 2006, while Gauteng Province refers to 2008.

Source: OECD calculations based on Quantec data and *OECD Regional Database.*

Indicators of economic inequality, such as the Gini coefficient, portray a deeply polarised economy of a nature different from that of many OECD member countries. First, while inequality in functional urban areas is normally higher than across regions within a country or across countries in South Africa, the converse appears to be the case (OECD, 2009a). Disparities across provinces in South Africa are larger than within provinces, and these remain greater than within Gauteng. Second, because at least in some municipalities, inter-personal inequality is greater than the levels across municipalities in Gauteng. Inequality can be measured by the Gini coefficient, which measures the distribution of income among a society and ranges from 0 to 1. The closer it gets to 1, the more unequal a city is, while the closer to 0 the more egalitarian a society. Using UN-HABITAT data, cities in South Africa are at the top of the ranking, showing an enormous inequality based on per capita GDP. The city of Johannesburg appears to be the most unequal city in South Africa, scoring a Gini value of 0.73, which is far above the 0.4 level established as International Alert line (Figure 1.42). UN-HABITAT data also show that Johannesburg is considered the most unequal city across the sample of 100 cities of all over the world. Nevertheless, caution is warranted in interpreting these findings, given the probability of concealed incomes among low-income residents and the difficulty of interpreting the considerable movement between multiple sites of residence.

Figure 1.42. **Interpersonal inequality in a sample of cities**

Gini coefficients for selected cities in Africa in 2008 (0.4 = International Alert line)



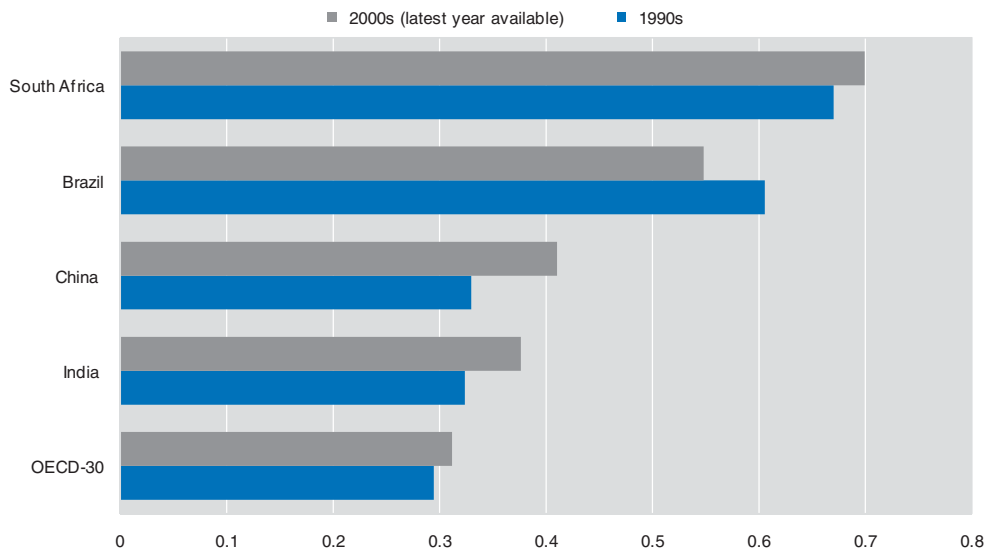
Note: Gini coefficients are based on income or consumption (depending on data availability).

Source: UN-HABITAT (2010), *State of the World's Cities 2010/2011: Cities for All, Bridging the Urban Divide*, Earthscan Publications, London.

South Africa presents not only one of the greatest levels of inequality in the world, but an instance where inequality is rising in tandem with economic growth. Compared with the highly unequal emergent economies of Brazil, China and India, South Africa shows the highest Gini coefficient. Moreover, it has been on the rise. Between 1993 and 2008, the Gini coefficient of per capita income fell by 9% in Brazil, with the decline accelerating considerably after 2000 (Figure 1.43). In contrast, it increased by 24% in China, by 16% in India and by 4.5% in South Africa, compared to 5.5% in the OECD member countries (OECD, 2010c). In China and India, income inequality has increased in urban and in rural areas, whereas in South Africa, inequality has increased more in urban areas and has decreased in rural ones. Thus, inequality is increasingly becoming an urban issue (Figure 1.44).

Figure 1.43. **Change in inequality in Brazil, China, India and South Africa, 1990s and 2000s**

Gini coefficient of household income

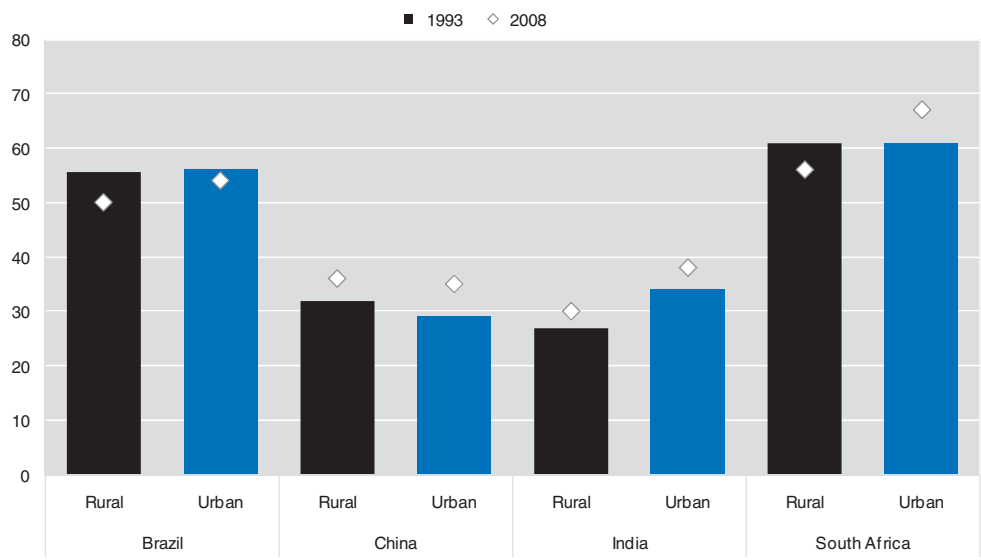


Notes: Data for the 1990's refer to 1993 for the BCIS countries and to the mid-1980s for OECD-30. Data for 2000s refer to the mid-2000s, except for Brazil and South Africa, where they refer to 2008. Gini coefficients are based on equivalised incomes for OECD member countries; per capita incomes for Brazil, China and South Africa; and per capita consumption for India.

Source: OECD (2010), *Tackling Inequalities in Brazil, China, India and South Africa: The Role of Labour Market and Social Policies*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264088368-en*.

Figure 1.44. **Urban and rural inequality in Brazil, China, India and South Africa**

Gini index of per capita household income or consumption



Note: data for China refer to 1993 and 2005; data for India refer to 1994 and 2005; data for India refer to household consumption.

Source: OECD (2010), *Tackling Inequalities in Brazil, China, India and South Africa: The Role of Labour Market and Social Policies*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264088368-en*.

Spatial disparities are all the more relevant because of their synergy with income inequality and social policies. Regional and intra-urban disparities can be argued to be part of the economic development process. Recently, a number of reports including one from the World Bank (2009), argue that economic and demographic concentration are both part of development and that economic growth will thus always be unbalanced. As such, any policy aimed at redressing the spatial imbalance will only retract from economic development. However, besides the obvious question of equity, the problem posed by spatial inequality is that it can undermine social and political stability (Kanbur and Venables, 2005). In addition, spatial inequality can be intimately related to interpersonal inequality. In the Czech Republic, Hungary, Poland and the Russian Federation, by decomposing interpersonal inequality by components of inter and intra-regional disparities computed in a Theil index,[41] Foster, Jesuit and Smeeding (2005) are able to show that while inequality accounts for some of the interpersonal inequality, intra-regional disparities account for the largest share of the variation. In the Russian Federation, much of the increase in interpersonal inequality is in fact spatial inequality (Yemtsov, 2005). The possible explanation for this is that many aspects related to income inequality can be traced back to social, political and geographical aspects of each region that govern income, such as infrastructure provision for mobility, access to public services, education, health and connectivity.

Gauteng not only faces inequality, but severe urban poverty. Before examining this, however, it is important to note that this section will rely on different indicators of poverty. The South African Government has made a concerted effort to alleviate poverty, and poverty was the focus of the first paragraph and section of the African National Council's 1994 blueprint for government (the Reconstruction and Development Programme). However, South Africa still lacks a formally agreed definition of poverty. Since 1994, government departments, civil society organisations, academics and others have proposed a wide range of measures and approaches to mitigate poverty. These range from income and asset poverty to caloric intake to a sustainable livelihoods approach, where the focus is on the capacities and potentialities the poor have, rather than the assets and income they lack.[42] Using its poverty line (four-person household with an income of ZAR1 290 per month at 2001 prices), the Human Sciences Research Council (HSRC) found that 42% of Gauteng's population lives in poverty. This seems high, but not when compared with the more rural provinces. In the Eastern Cape, 72% of the population lived in poverty, and in Limpopo, 77%, according to the HSRC definition. The Presidency, with Statistics South Africa, developed a set of National Development Indicators (NDI), which are reported against annually. Three poverty lines are used for the NDI, the percentage of population living below ZAR 238 a month or ZAR 524 a month (in 2008 currency) taken from the Statistics South Africa *Income and Expenditure Survey* (IES), and ZAR 388 a month (using the *All Media Product Survey* conducted by the South African Advertising Research Foundation) (Table 1.11). The provincial distribution is stark, although Gauteng emerges well, with the lowest proportion living under this particular poverty line – but the figure has remained constant over time, reflecting the challenge of meeting social targets while population increase continues apace. It is also notable that the more rural provinces around Gauteng – North West, Free State, Limpopo, Mpumalanga – show far higher levels of poverty, explaining the lure of the Gauteng city-region in this context (Gauteng City-Region Observatory, 2010a).

Table 1.11. **Estimates of extreme poverty in South Africa's provinces, 1995 and 2008**

Province	1996	Estimated number of people living in poverty	1995 IES	2008 population estimates	Estimated number of people living in poverty	2008 IES
East Cape	6 147 244	3 073 622	50%	6 579 245	1 907 981	29%
Free State	2 633 504	1 185 077	45%	2 877 694	460 431	16%
Gauteng	7 624 893	533 743	7%	10 447 246	626 835	6%
KwaZulu Natal	8 572 302	2 675 414	31%	10 105 437	3 334 794	33%
Limpopo	4 576 133	1 876 215	41%	5 274 836	1 793 444	34%
Mpumalanga	3 124 203	1 062 229	34%	3 589 909	1 005 175	28%
North Cape	1 011 864	404 746	40%	1 125 881	303 988	27%
North West	2 963 554	998 428	34%	3 425 153	787 785	23%
West Cape	3 956 875	356 110	9%	5 261 922	473 573	9%
Total	40 583 573	12 580 908	31%	48 687 323	10 711 211	22%

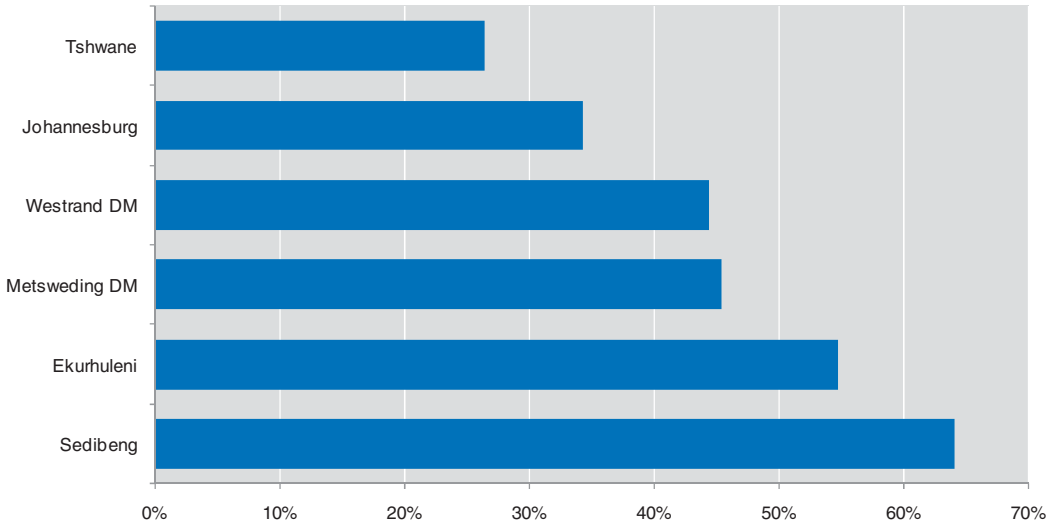
Note: Extreme poverty is defined as the percentage of population living below ZAR 238 per month.

Source: Presidency of South Africa (2009), *Development Indicators 2009*, Presidency of the Republic of South Africa, Pretoria, *www.thepresidency.gov.za/learning/me/indicators/2009/indicators.pdf*.

Poverty is not homogeneously distributed throughout Gauteng without regard for location and race. In 2010, Black Africans represented the racial majority in Gauteng (75.0% of the total population), followed by whites (18.7%), coloured (3.6%), and Indian/Asian (2.7%) (Statistics South Africa, 2010a).[43] Using census data, the spatial distribution of low-income residents in the Gauteng city-region shows that poor households cluster around the townships created by apartheid as well as in the northern border of the province (Gauteng City-Region Observatory, 2010a).[44]

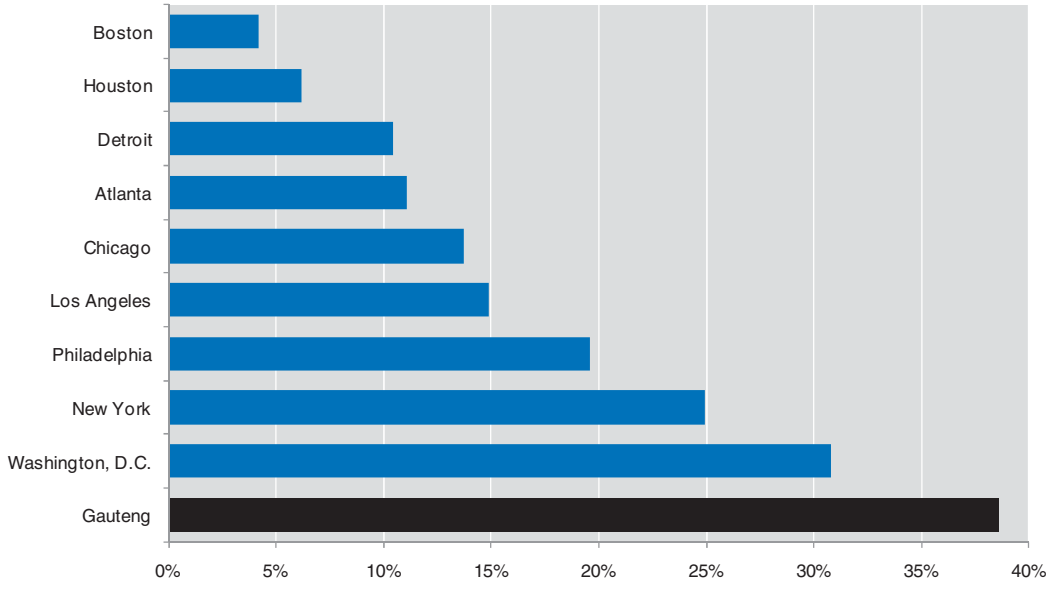
The Gauteng city-region's concentration of poor in high-poverty neighbourhoods, rather than mixed-income neighbourhoods, places additional constraints on economic mobility. A high concentration of the poor in high-poverty neighbourhoods leads to less economic opportunity, given the reliance on social networks to secure employment. The high level of economic segregation means that Gauteng's poor not only have to cope with their own poverty, but also with lower quality schools, inadequate infrastructure and social networks with a high level of unemployment. Gauteng's concentrated poverty rate (the rate of poor living in high-poverty neighbourhoods) stands at 38.6%. The rates in Sedibeng (64.1%) and in Ekurhuleni (54.7%) are particularly alarming (Figure 1.45). Though international comparative datasets do not exist on neighbourhood poverty, Gauteng's rates can be compared to rates found in major metropolitan statistical areas (MSAs) in the United States (Figure 1.46).

Figure 1.45. **Concentrated poverty rates within Gauteng, 2003**



Source: OECD based on South Africa Department of Transport's *National Transport Survey* data.

Figure 1.46. **Concentrated poverty rates in Gauteng and United States metropolitan areas, 2000 and 2003**

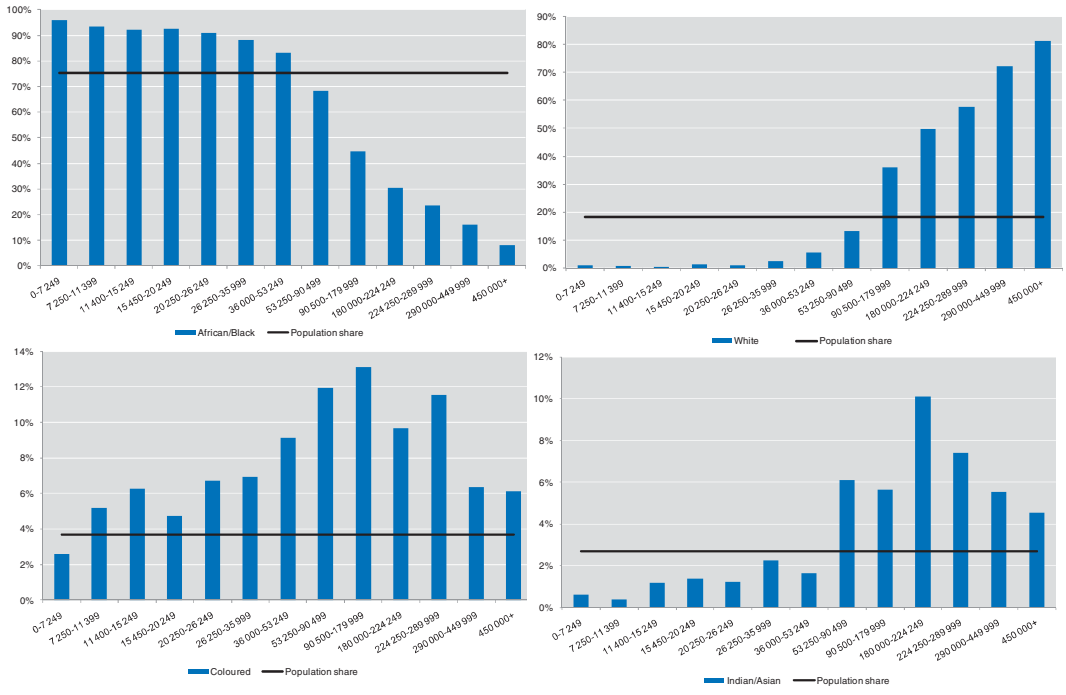


Note: "Concentrated poverty" is defined as the proportion of a metropolitan area's poor population living in high-poverty areas. Gauteng data corresponds to 2003 and the US data is from 2000.

Source: OECD based on South Africa Department of Transport's *National Transport Survey* data (2003) and Jargowsky (2003), "Stunning Progress, Hidden Problems: The Dramatic Decline of Concentrated Poverty in the 1990's", The Living Cities Census Series, The Brookings Institution, Washington, D.C., based on the 2000 United States Census.

Income distribution is not racially neutral in the Gauteng city-region: Africans earn disproportionately low levels of income. While Africans comprise 75.2% of Gauteng's population, 95.8% of households in the lowest income band (ZAR 0 to ZAR 7 249) are African. In this same income band, 2.1% of residents are white, although they comprise 18.4% of Gauteng's population. For the coloured population, the Gauteng representation is 3.7%, and 1.5% are in the lowest income band. Indians/Asians represent 2.7% of the population and 0.5% residents are in the lowest income band. On the other hand, the highest income band (ZAR 450 000+) is overrepresented by whites (75.8%), Indians/Asians (3.0%) and coloured (10.5%) households, but grossly underrepresented by Black Africans, who comprise only 10.8% of the households (Figure 1.47).

Figure 1.47. **Household income distribution by race in Gauteng, 2005**



Source: OECD calculations based on Statistics South Africa (2006), *Income and Expenditure Survey 2005-06*, Release P0100, Statistics South Africa, Pretoria.

Poor health indicators, particularly HIV and infant and child mortality, have an enormous multi-sectoral impact on society, economy, productivity and family structure. In terms of HIV, 12.0% of South Africa's population was HIV positive in 2009 and Gauteng's HIV-positive population stood at 11.7% (Gauteng Provincial Government, 2009b). The HIV-positive population in Gauteng did, however, decline by 50 000 from 1.25 million in 2004 to 1.2 million in 2008. The leading natural causes of death were tuberculosis (10.6%) and influenza and pneumonia (10.4%). Frequently, these two leading causes of death were AIDS-related opportunistic infections (Gauteng Provincial Government, 2010). Indeed, according to estimates from IHS Global Insight, it was estimated that HIV/AIDS deaths accounted for approximately a quarter of total deaths in Gauteng Province between 2001 and 2008 (cited in Gauteng Provincial Government, 2010). Infant mortality was estimated at 46.9 per 1 000 live births in 2010 (Statistics South Africa, 2010b).

Spatial inequality: the persistence of housing backlogs and neighbourhood poverty

The challenges of post-apartheid housing delivery in 1994 (the provision of decent housing for low-income population combined with deracialised service provision) have been amplified by a series of factors, including a rapidly growing population, decreasing household size, an elevated housing demand from the inflow of immigrants, and a dysfunctional secondary housing market with a limited stock of affordable housing. Collectively, this situation increases the housing backlog in Gauteng by 52 500 units per year (Gauteng Provincial Government, 2009b). Gauteng's large housing backlog is in line with national trends: South Africa still has a backlog as large as it had in 1994. While 2.5 million households have been served by the housing subsidy scheme, an estimated 2.5 million are waiting for assistance (Rust, 2009). This has occurred in spite of the dramatic delivery of public housing following apartheid. Consequently, nearly one-fourth of Gauteng's residents live in informal housing.

Allocating public housing to facilitate economic mobility and alleviate poverty is an equally complex issue for the city-region. The spatial mismatch between where the population resides and where jobs are being created may constrain job searches and limit economic opportunity. The preponderance of employment growth in South Africa's cities occurs at a distance from the residential location of the largest proportions of the African population, which is also the least employed. The distance between residential location and the city centre "plays a much more important role in explaining African unemployment in South Africa, even when controlling for education and income levels" (Naudé, 2008). Outside South Africa, spatial constraints on job searches have been shown to influence employment rates.[45]

Though the location of high levels of subsidised housing in peripheral "job-poor" zones may have trapped communities in sub-optimal employment circuits, it is undeniable that these areas provide the benefit of affordable housing that "job-rich" zones do not. People who cannot attain regular employment may locate in the least expensive areas, which happen to be on the periphery of the Gauteng city-region. In this sense, the "spatial mismatch" hypothesis may be reinforced by the real estate market and the residents' disposable income, as much, if not more, than by urban form.

The persistence of Gauteng's housing deficits

Gauteng residents maintain a broad range of tenure arrangements, ranging from ownership of a home in the formal market to occupation of a vacant lot. Though it is not possible to determine absolute numbers of households in rental, social rental or owner-occupier circumstances, the Gauteng City-Region Observatory's 2009 *Quality of Life Survey* is able to present an up-to-date picture of the proportions in each arrangement. This suggests that, across Gauteng, 65.2% own their own home, either through mortgage financing or because housing has been granted to them by the government. The survey reports that 11.8% of respondents live in free public homes (Reconstruction and Development Programme or RDP houses) and 21.7% of households rent their home either in formal or informal housing markets (Gauteng City-Region Observatory, 2010b).[46]

Housing provision in South Africa has deservedly received much policy attention, given its potential as a catalyst of economic development and a vehicle for socio-economic integration. Housing emerged as a central policy priority after the passing

of apartheid and prompted massive investment in South Africa. The *Housing White Paper* (1994) portrayed housing as "one of the greatest challenges facing the Government of National Unity" and encouraged government to strive for the "establishment of viable, socially and economically integrated communities, situated in areas allowing convenient access to economic opportunities as well as health, educational and social amenities," (Department of Housing of South Africa, 1994). Initially the South African Government focused on scale and delivered 1 million housing units within seven years. Indeed, between 4.5 million and 5 million residents in South Africa were given tenure from 1994 to 2001, a level purported to be "unsurpassed anywhere in the world" (Minister of Housing of South Africa, 2001; quoted in Khan, 2003).

Gauteng should be acknowledged for its impressive delivery of public housing after apartheid. Between 1994-95 and 2002-03, almost 1 million housing subsidies were approved in Gauteng, and a total of 340 331 RDP houses were built, indicating a significant lag in the construction of subsidised units. Between 2003-04 and 2007-08, a further 275 382 subsidies were issued and 343 012 homes were built, indicating some catch-up in the construction process. In 2008-09 and 2009-10 a further 114 123 houses were constructed (data on the number of subsidies issued were not available for these two years).[47] While the gap between subsidy approval and completion of RDP homes is large, it needs to be recognised that an estimated 797 000 RDP dwellings constructed in Gauteng over a 15-year period is a significant achievement (Table 1.12). It represents 27% of all housing delivery in the country during this period.

Table 1.12. **Scale of public housing provision in Gauteng and South Africa, 1994-2009**

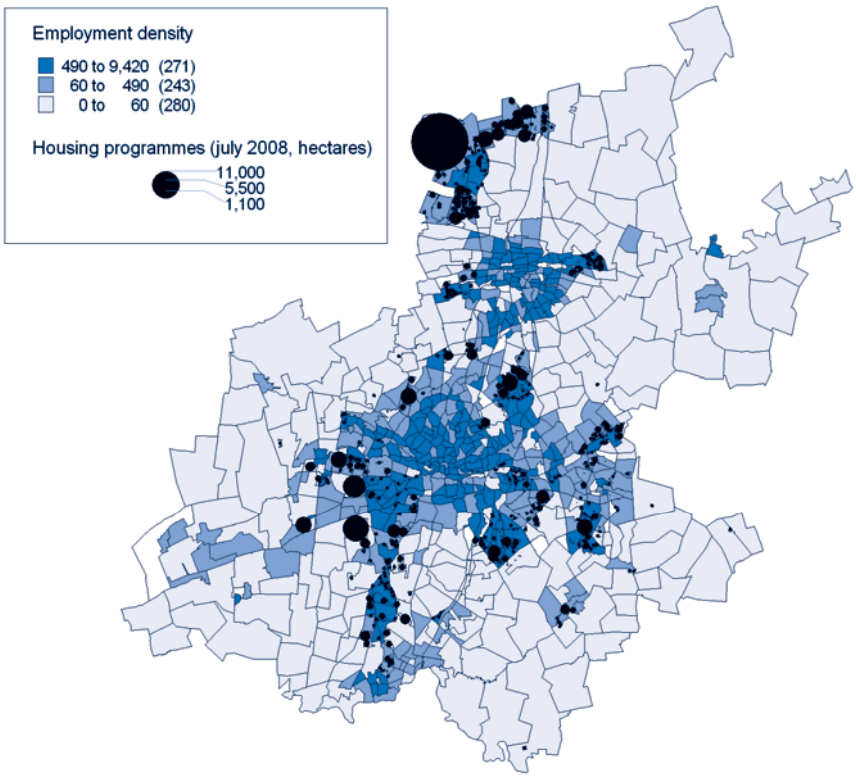
	1994-95-2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Total
Approved subsidies	989 016	39 086	54 045	56 373	53 234	72 644			
Completed units	340 331	49 034	66 738	59 310	77 044	90 886	80 469	33 654	797 466
Approved subsidies	2 299 988	189 602	250 041	137 746	166 523	252 064			
Completed units	1 420 897	193 615	217 348	252 834	271 219	248 850	239 533	161 584	3 005 880

Note: Data for subsidies approved in 2008-09 and 2009-11 were not available.

Source: Republic of South Africa, National Treasury (2009), *Provincial Budgets and Expenditure Review 2009*, and statistics on the National Department of Human Settlements website, *www.dhs.gov.za*.

Public housing provision has mainly been allocated in economically deprived areas and has generally followed a sectoral approach, which has reinforced the spatial mismatch by providing housing units in locations of minimal employment. Paradoxically, the large-scale delivery of individual units through capital subsidies has not significantly changed the urban form established under apartheid. For instance, within Gauteng, the allocation of RDP housing has been in areas peripheral to intensive employment (Figure 1.48). The combination of high financial costs and limited budgets has obliged local governments to develop in the outskirts, which lack amenities and socio-economic infrastructure. This has trapped communities in suboptimal employment circuits, with low income and employment multipliers (mainly informal employment).

Figure 1.48. **Location of RDP housing in job-poor neighbourhoods in Gauteng, 2008**



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: OECD based on housing programmes layer for Gauteng, dated July 2008.

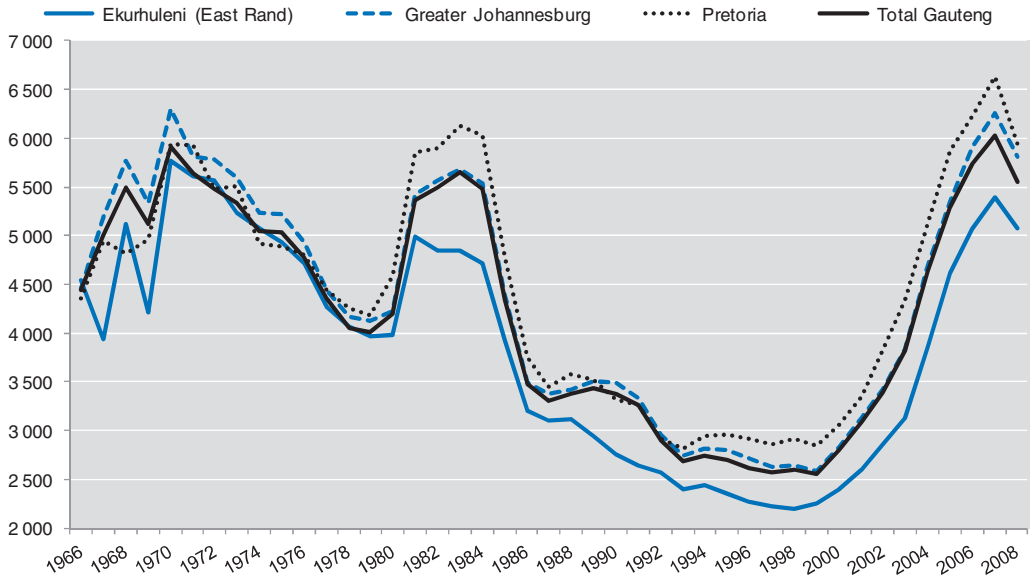
The secondary housing market (home resales) shows clear signs of being dysfunctional, given high access barriers to urban land markets and low turnover rates in former black township areas and low-income neighbourhoods. Within township areas, property markets suffer from a variety of procedural factors, including delays in transferring titles to beneficiaries of government subsidy houses. This results in lack of legal title, prohibitions on subsidy beneficiaries from selling their RDP houses within eight years of occupation,[48] lack of conveyancers and estate agents operating in these areas, and expensive transaction costs, which often force households to remain where they are or sell informally (Nell et al., 2004). In South Africa, only 3% of properties in former black township areas and 4% of properties in low-income areas were subject to transactions from 2007-09. This compares with 11% in the properties that fall into the ZAR 250 000 to ZAR 750 000 segment, suggesting both a problem in liquidity and a lack of accommodation in the lower market segment (Rust, 2009).

Home prices in Gauteng's formal market have increased markedly since 2000, which has compromised the affordability of homes in the formal housing market. Housing prices for new and old houses were relatively high in the 1970s and 1980s. However, both prices trended downwards in real terms between the middle of the 1980s until 2000, at which point they started to rise rapidly. This effect has been roughly the same across municipal areas. Tshwane appears to be the municipality with the highest housing prices, followed by Johannesburg and Ekurhuleni (Figure 1.49). In South Africa, new housing targeted at

the "affordable" market cost approximately ZAR 350 000 in 2009, which a household earning approximately ZAR 14 000 per month could afford. Unfortunately, 80% of South African households earn less than ZAR 9 000 per month and therefore cannot afford to buy new housing (Rust, 2009).

Figure 1.49. **Municipal housing prices in Gauteng**

Old and new houses, 1966-2008 (in constant prices, ZAR)



Source: Quantec.

Over one in four Gauteng residents live in a situation of housing need. Absolute need in the South African context is usually calculated by counting the number of households that in the Census, or in national surveys, are enumerated in housing types that do not meet certain minimum standards. Households living in informal backyard dwellings, in informal dwellings not in backyards, in structures made of traditional materials, and in worker hostel arrangements, are usually regarded as in need of decent housing. The largest percentage of households in need of decent housing is recorded in Westonaria and Merafong (Table 1.13). This is because of the very high numbers of (likely single-person and male) households in workers' hostels in and around mines in the area. However, it is probable that these households, living in Gauteng in migrant labour circumstances, have homes in other parts of the country. The largest total need for housing is in Johannesburg and Ekurhuleni. Ekurhuleni had an estimated 143 439 households in informal settlements in 2007, and Johannesburg had 120 701. Tshwane has a higher number of households in informal settlements, at 135 352, but its numbers of households in informal backyard dwellings is far lower. In Johannesburg, 97 880 households lived in backyard shacks in 2007, compared to 48 464 in Tshwane, and 77 161 in Ekurhuleni.

Table 1.13. **Housing need in the Gauteng city-region, 2007**

Municipality in Gauteng	Number of households in need	% of total households in need
Ekurhuleni	242 547	28.6%
Tshwane	196 029	28.5%
Johannesburg	260 153	22.3%
Mogale	28 820	30.6%
Randfontein	11 630	28.7%
Westonaria	38 110	75.2%
West Rand DMA	253	17.7%
Merafong	51 264	58.2%
Emfuleni	32 976	16.8%
Midvaal	2 742	11.3%
Lesedi	3 103	15.2%
Nokeng tsa Taemane	4 167	28.1%
Kungwini	7 847	24.8%
Total	879 641	27.0%

Note: Number and percentage of households in each municipality in informal settlements, informal dwelling in backyard, traditional dwelling or worker's hostel.

Source: Statistics South Africa (2008), *Community Survey 2007*, Statistical Release P0301, Statistics South Africa, Pretoria.

With few affordable options and a growing housing backlog, residents have entered the informal housing market *en masse*. Gauteng has a larger percentage of households living in informal dwellings than the South African national average. In 2009, approximately 22.3% of residents in Gauteng lived in informal or traditional dwellings, either in the backyards of formal homes, or in informal settlements,[49] compared to the South African national average of 13.4% (Table 1.14). In 2009, the Gauteng Provincial Government (2010) calculated that 600 000 housing units lacked basic services and infrastructure. The Gauteng Provincial Government has also identified 20 Priority Townships across the province that deserve particular attention. Within Johannesburg alone, there are now 180 informal settlement areas that accommodate approximately 180 000 households. In addition, Gauteng's decreasing household size, the smallest in the country, at an average of 3.3 people per household compared with a national average of 3.9 per household, also implies that, even if population levels were constant, household demand is increasing.[50]

Informal settlements are spreading throughout the Gauteng city-region, compounding the challenge of providing capital upgrades in a cost-efficient manner and urban development along planned economic nodes. A new spatial geography of informality is emerging, for example, in Johannesburg, where smaller informal settlements are proliferating (City of Johannesburg, 2008b). These are distributed chiefly in the south of the city and along its north-western perimeter. Most are not properly connected to public services. Smaller settlements are more costly to upgrade per inhabitant than larger settlements, given the economies of scale of sewerage, road and electrical provision. Existing figures reveal that 21 of the informal settlements have grown by more than 50% from their initial size and only 28 settlements have decreased in size. The key challenge in the future will be either to relocate the inhabitants of informal settlements to formal state-provided housing, or to formalise and consolidate informal settlements where it is possible and desirable to do so, ideally in close proximity to existing and/or future economic opportunities (City of Johannesburg, 2008).

Table 1.14. **Dwelling type by province in South Africa, 2001 and 2009**

(%)

Province	2001				2009			
	Formal	Informal	Traditional	Other	Formal	Informal	Traditional	Other
Eastern Cape	51	11	37	0	57	7	35	1
Free State	66	26	7	0	81	15	3	1
Gauteng	**75**	**24**	**1**	**0**	**74**	**22**	**0**	**4**
KwaZulu-Natal	60	11	29	0	66	09	23	3
Limpopo	73	7	20	0	85	5	7	2
Mpumalanga	72	15	13	0	81	08	8	3
Northern Cape	81	11	7	1	86	8	5	1
North West	72	23	5	0	82	16	1	2
Western Cape	81	16	2	0	79	17	0	3
South Africa	69	16	15	0	74	13	10	3

Note: "Other" includes living in a boat/ship, caravan, tent and workers' hostels as well as any mis-specified during the two surveys.

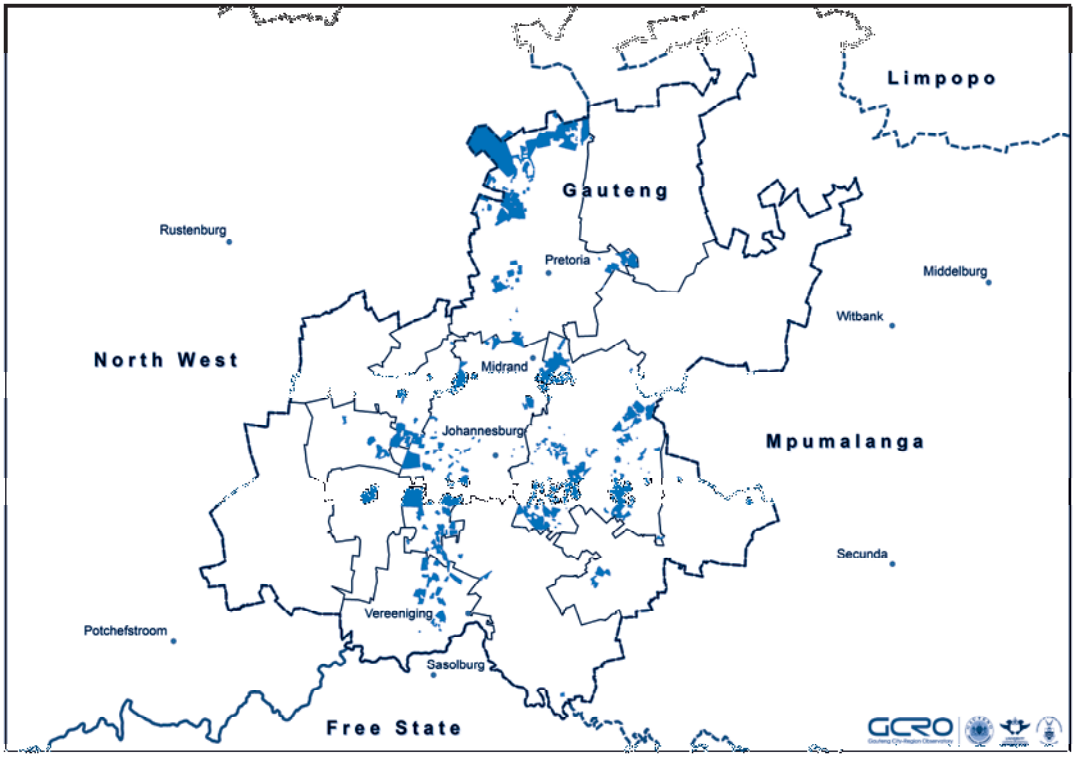
Source: Statistics South Africa (2001, 2009), *General Household Survey*, Statistics South Africa, Pretoria.

Location disadvantages and Gauteng's new geography of poverty

To achieve the high rates of public housing delivery discussed earlier, subsidised housing has tended to be built in peripheral areas that isolated residents in "job-poor" zones and prevented them from renting units in moderate-income neighbourhoods. To maximise the number of units built, RDP housing was located in poorer areas of the city-region, usually on the edges of municipalities, and with a preponderance in southern and western Johannesburg, on an axis running between Johannesburg and Vereeniging (the Orange Farm, Evaton, Sharpeville complex of informal settlements and townships), and in the far northern parts of Tshwane (Figure 1.50). Subsidies were not given for low-income residents to rent in moderate income neighbourhoods, as is common throughout OECD member countries. This has resulted in a degree of ghettoisation that has tended to trap communities in sub-optimal employment circuits.

Low-income Black Africans disproportionately live in deprived neighbourhoods compared to low-income residents of other population groups in the Gauteng city-region, which infringes upon their ability to take advantage of economic opportunities and the social networks of less disadvantaged areas. Within a typical high-poverty neighbourhood in Gauteng, 98.3% of the population is Black African, followed by whites (1.26%), coloured (0.27%), and Asians (0.09%) (Figure 1.51). These figures are not commensurate with the overall distribution of the population with poverty incomes, which shows a lower rate for the Black African population (93.9%) and whites (0.31%) and a much higher rate for coloured (4.09%) and Asians (1.70%). In other words, Black Africans are overrepresented in high poverty zones by 25%, while whites, coloured, and Asians together are underrepresented by -18.1%. Within Gauteng, 21.1% of Black Africans, 0.8% of whites, 1.1% of coloured, and 0.5% of Asians lived in high-poverty neighbourhoods. Comparatively, the spatial location of Black Africans in deprived neighbourhoods is comparable to the concentrated poverty rates experienced by African-Americans in Baltimore (21.5%) or Washington, D.C. (23.9%) and Latinos in Los Angeles (16.9%) or Washington, D.C. (23.5%) in 2000 (Jargowsky, 2003).

Figure 1.50. **Public housing projects in Gauteng, 2008**

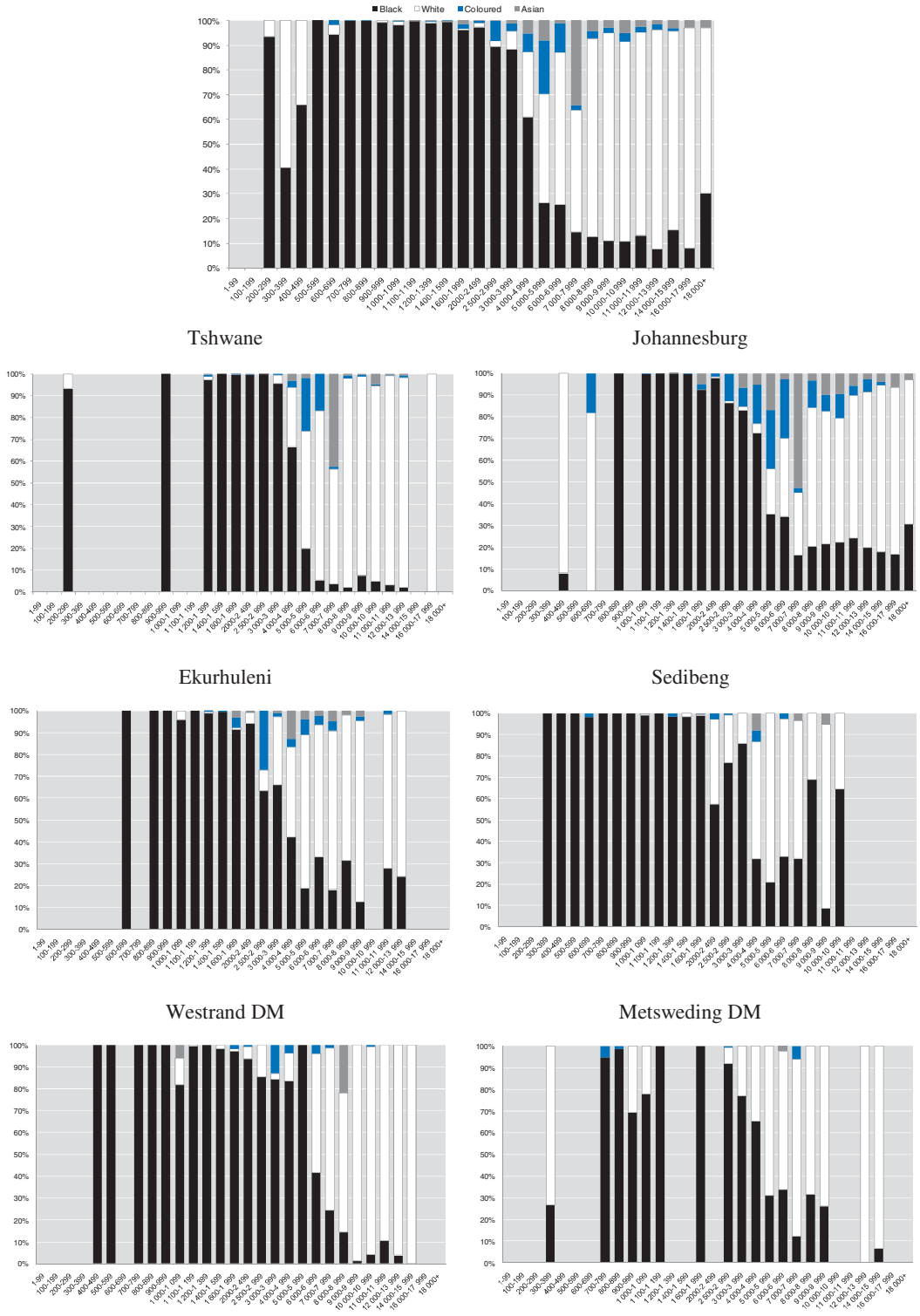


Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map. Merafong is excluded.

Source: Gauteng City-Region Observatory (2010), "Background Report for OECD Gauteng Territorial Review", 25 October version, based on data from the Gauteng Provincial Government Department of Local Government and Housing.

Important municipal differences exist with respect to the attainment of racially mixed neighbourhoods. In Tshwane, higher-income neighbourhoods generally lack Black Africans and, in Sedibeng, the opposite trend occurs. Johannesburg offers the highest degree of racially mixed neighbourhoods, and throughout Gauteng, racially mixed neighbourhoods seem to occur within the ZAR 4 000 to ZAR 7 999 income band. Spatially, there is also evidence that the African population in city centres increased in the centres of Ekurhuleni, Johannesburg and Tshwane from 1996 onwards (Naudé, 2008). Relatively few low-income neighbourhoods exist in Tshwane and Johannesburg, while Sedibeng and the West Rand offer "dormitory communities" for workers in Tshwane and Johannesburg.

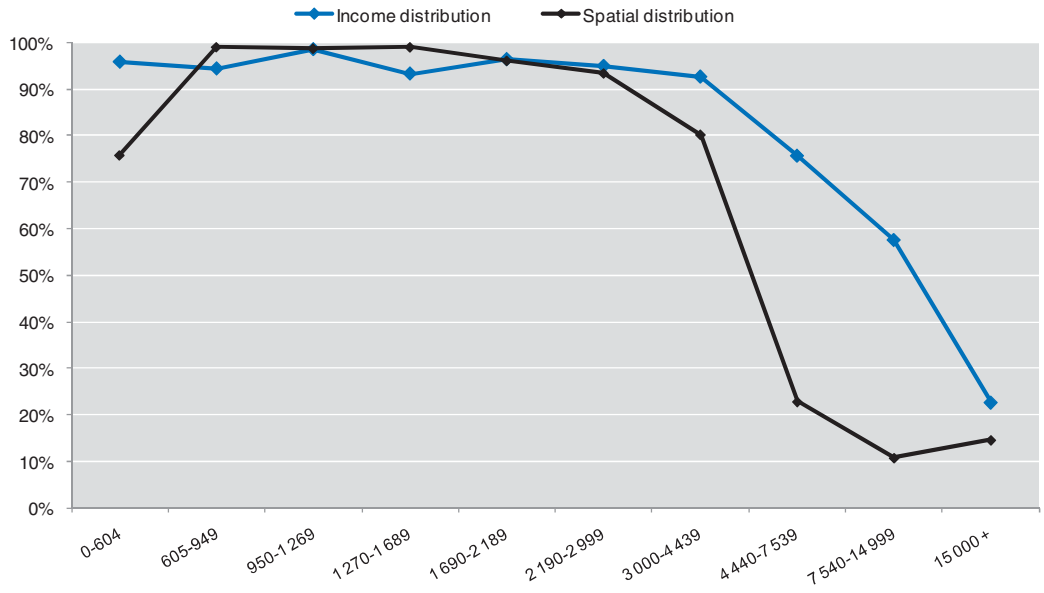
Figure 1.51. **Racial composition in Gauteng by median income level of residents in neighbourhood, 2005 (ZAR)**



Source: OECD analysis based on Gauteng Department of Roads and Transport (2006), *Gauteng Transport Study 2000*, Gauteng Provincial Government, Johannesburg.

Spatial analysis suggests that middle- to upper-middle-class Black Africans tend to live in neighbourhoods where their neighbours earn less income than themselves. This suggests a deficit in middle-class Black African neighbourhoods. Though evidence on racial desegregation suggests a rising degree of concentration of Black Africans in high-income neighbourhoods, there is a gap in middle-income housing. Indeed, while 75.6% of those who make between ZAR 4 440 and ZAR 7 539 each month are Black African, only 22.9% of those who live in neighbourhoods where the average income is in this level are Black African. If Black Africans lived in areas proportional to their income, there would be twice as many Black Africans in such neighbourhoods than the current levels. A similar gap exists for the ZAR 7 540 to ZAR 14 999 income band, though the gap narrows at the wealthiest increment (Figure 1.52).

Figure 1.52. **Spatial distribution vs. income distribution of Black Africans in Gauteng, 2005 (ZAR)**



Source: OECD analysis based on Gauteng Department of Roads and Transport (2006), *Gauteng Transport Study 2000*, Gauteng Provincial Government, Johannesburg; and Statistics South Africa (2006), *Income and Expenditure Survey 2005/06*, Statistics South Africa, Pretoria.

Infrastructure and transport constraints

The "service backlogs" problem

The Gauteng city-region has inherited a considerable problem of "service backlogs" from the apartheid era, when inequality in infrastructure and public services was institutionalised. African areas then and today remain poorly designed for the numbers of people they eventually came to accommodate. Though there was variation across townships, they were generally over-crowded, and households were inadequately serviced with water, sanitation, power and waste removal. The urban environments for Black Africans were deficient, especially compared with wealthier parts of the city-region previously designated for whites only. They had fewer green and public spaces, inferior

access to libraries, clinics and other facilities, lower quality road infrastructure and often less accessible and less efficient public transport services. Gauteng shares these challenges with other regions in South Africa. One national government study from 2005 documented that municipalities needed an additional ZAR 6 billion to effectively manage the infrastructure currently in place and to honour their service commitments.[51]

Service delivery shows positive trends in the Gauteng city-region. The percentage of residents with piped water inside their dwelling increased from 46.4% in 2001 to 66.2% in 2007. In terms of other municipal services, such as refuse removal, sanitation, and water services, the majority of households in Gauteng enjoy services that are on par with or above the minimum RDP standard (City of Johannesburg, 2008). Projects led to the near-eradication of the bucket toilet system, and Gauteng municipalities have undertaken water and sanitation projects on a massive scale. From 2006 to 2009, municipalities in the Gauteng city-region infrastructure expenditure through municipal infrastructure grants (MIGs) exceeded ZAR 5 billion. Over this period, 1 026 kilometres of roads were built and supported by 88 storm water projects. Equally important, all municipalities in the Gauteng city-region provide free basic electricity ranging from 50 kWh to 100 kWh per month.

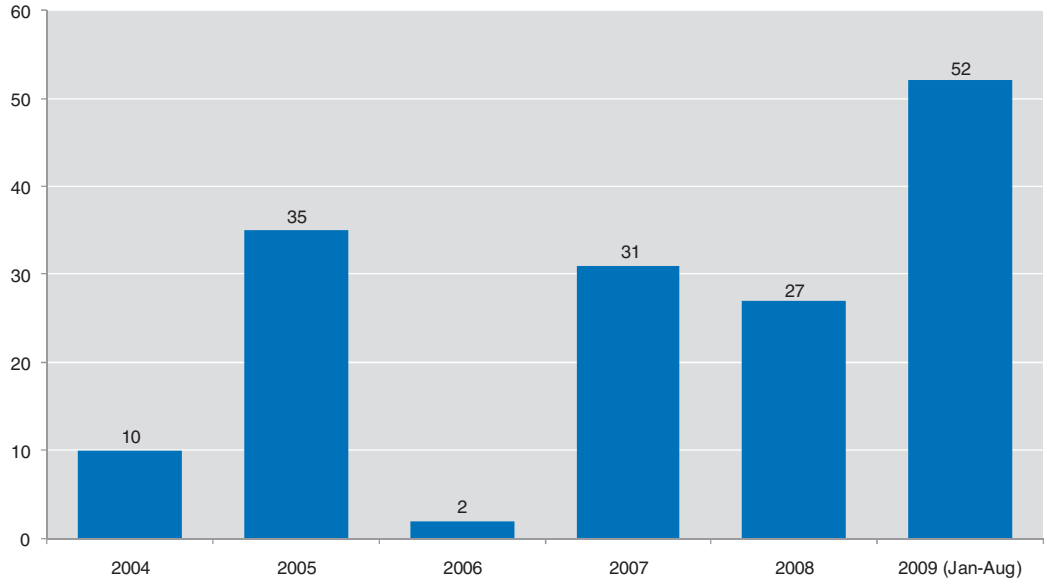
However, infrastructure gaps remain in the use of electricity for heating, waste removal and piped water (Table 1.15). This is reflected in the recent service delivery protests: from January to July of 2009, 30% of the protests on service delivery occurred within Gauteng (Co-operative Governance and Traditional Affairs, 2009). What is significant is not only that Gauteng has the largest share of protests in South Africa, but that the frequency of such protests is on the increase (Figure 1.53).

Table 1.15. **Municipal service delivery in Gauteng, 2001 and 2007**

	2001	2007
Total piped water	97.1	97.9
Piped water inside dwelling	46.4	66.2
Waste removal	84.6	86.2
Toilet access	96.4	98.4
Use of electricity for cooking	72.4	81.3
Use of electricity for lighting	80.4	83.3
Use of electricity for heating	69.8	76.7

Source: Statistics South Africa (2001), *Census 2001,* Statistics South Africa, Pretoria; Statistics South Africa (2008), *Community Survey 2007*, Statistics South Africa, Pretoria, *www.statssa.gov.za/Publications/P03011/P030112007.pdf.*

Figure 1.53. **Service delivery protests in Gauteng, 2004-09**

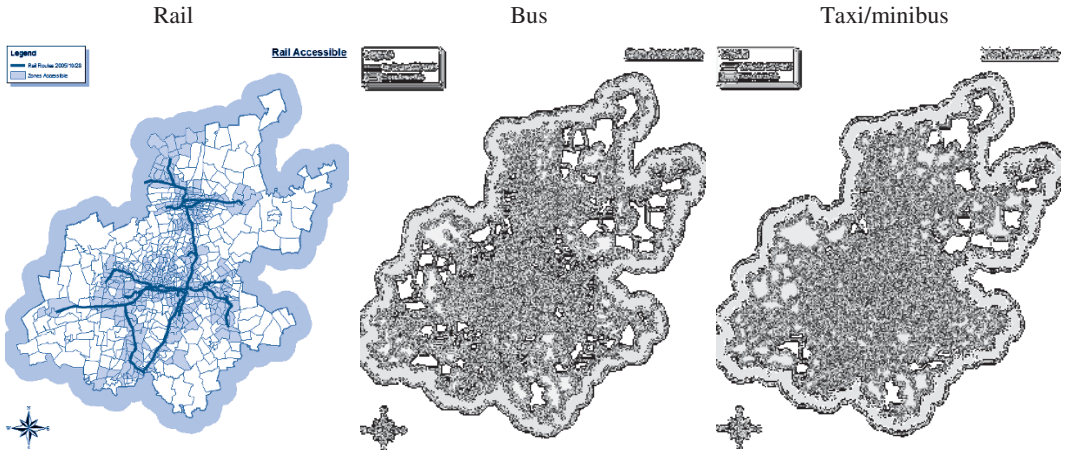


Source: Co-operative Governance and Traditional Affairs (2009), *State of Local Government in South Africa: Overview Report*, National State of Local Government Assessments, CGTA, Pretoria.

Public transport: obstacles for achieving accessibility and affordability

Accessibility and affordability of public transport pose particular challenges for the Gauteng city-region. Access to public transport is very low, which reduces mobility and raises the cost of income for transport. In Gauteng, 54.2% and 43.7% of citizens are not within walking distance to a train or bus station. This level is even more elevated in municipalities such as Metsweding, where 89.0% of the population lacks train access and in West Rand, where 81.6% lack bus access (Table 1.16). This leaves them dependent on taxis (only 6.4% of Gauteng residents do not have access) whose networks have the largest coverage area in Gauteng (Figure 1.54). Taxis, however, are not publicly owned and managed, and tend to cost more for residents, reducing their disposable income. Overall, poor levels of transport have contributed to rising rates of motorisation. Car-related commuting (private car, mini-bus taxi and bus) accounts for 81.2% of trips and private car use increased by 13% from 1995-2002. According to the 2002 *Gauteng Household Interview Survey* (GHIS), during the morning peak hours, 53% of all trips are made by private transport (private car, bicycle, walk and others) and 47% by public transport (minibus taxi, bus and train). However, the recent introduction of the "Gautrain" high-speed rail system is expected to become a key transport mode between Johannesburg and Tshwane (albeit for higher-income commuters), though it needs to be better linked to feeder lines to substantially reduce car commuting.

Figure 1.54. **Transport access in Gauteng: rail, bus, taxi/minibus**



Note: These maps are for illustrative purposes and are without prejudice to the status of or sovereignty over any territory covered by these maps.

Source: Gauteng Department of Roads and Transport (2006), *Gauteng Transport Study 2000*, Gauteng Provincial Government, Johannesburg.

Table 1.16. **Walking time to train, bus and taxi access points by municipality in the Gauteng city-region, 2003**

	1-15 min	16-30 min.	31-60 min.	61+ min.	No service
Walking time to the nearest train station					
City of Tshwane	23.4%	26.5%	6.0%	0.7%	43.3%
Ekurhuleni	21.7%	16.1%	6.9%	2.0%	53.2%
City of Johannesburg	23.5%	16.8%	6.7%	0.5%	52.5%
West Rand	10.6%	13.2%	7.1%	0.8%	68.3%
Sedibeng	13.7%	15.7%	12.5%	4.2%	53.9%
Metsweding	1.8%	3.2%	5.4%	0.6%	89.0%
Gauteng	20.4%	16.9%	7.2%	1.3%	54.2%
Walking time to the nearest bus station					
City of Tshwane	86.2%	4.5%	0.6%	0.0%	8.7%
Ekurhuleni	26.2%	3.4%	0.3%	0.0%	70.0%
City of Johannesburg	62.1%	5.8%	1.0%	0.0%	31.1%
West Rand	17.0%	1.2%	0.2%	0.0%	81.6%
Sedibeng	61.3%	14.0%	2.0%	0.2%	22.4%
Metsweding	58.8%	12.3%	1.3%	0.0%	27.6%
Gauteng	50.2%	5.3%	0.7%	0.0%	43.7%
Walking time to the nearest taxi rank					
City of Tshwane	87.1%	6.2%	1.1%	0.0%	8.0%
Ekurhuleni	79.3%	13.6%	1.5%	0.1%	5.4%
City of Johannesburg	85.6%	8.0%	1.4%	0.0%	5.0%
West Rand	74.8%	10.6%	2.9%	0.0%	11.6%
Sedibeng	72.7%	15.9%	2.8%	0.5%	8.0%
Metsweding	63.5%	17.2%	1.8%	0.0%	17.5%
Gauteng	81.3%	10.5%	1.7%	0.1%	6.4%

Source: South African Department of Transport (2005), *National Household Travel Survey 2003*, Department of Transport, Pretoria.

Bus and train ridership levels are low because of insufficient access, low stock and low frequency. Mini-taxis (minibus, sedan or *bakkie*) cover a larger area; only 6.4% are not in walking distance to these modes of transport. According to the nearly 9 000 people in Gauteng who responded to the *National Transport Survey*, 61% of train users were dissatisfied with the distance between their home and the station, 54% were dissatisfied with the travel time, 63% with the punctuality of trains, and 20% with the fares. Consequently, only 9.5% of the population uses rail to commute to work, in contrast to the much higher rates for Cape Town (17.0%) or Seoul (32.5%) (UN-HABITAT, 2007). In respect to bus ridership, 21% of bus users were dissatisfied with the distance between home and the station, 21% were dissatisfied with the travel time, 27% with the punctuality of trains, and 35% with the fares. In sum, 45% of rail users and 23% of bus users were dissatisfied with the overall service. Largely as a result of this decrease in rail and tram services, and with bus services unable to respond to the enormous demand for commuter services from the outlying areas to jobs and activities in the urban centres, minibus taxi services began to fill the gap in transport provision. Now considered a privately owned form of public transport, these minibus taxis have emerged in the South African travel landscape and resemble minibus systems used in such cities as Dakar and Dar-es-Salaam (Box 1.7).

Box 1.7. **The minibus taxi industry**

Under apartheid, African residents were regarded as temporary urban residents, and the fragmented system of apartheid local government made co-ordinated planning and spending impossible. This led to massive underinvestment in rail and bus infrastructure for the poorer sections of the population living in the south of Johannesburg. By the 1980s overcrowding on these modes of transport had become intolerable. Entrepreneurial businessmen (in townships) took matters into their own hands and launched the minibus taxi industry. In the last three decades, this has grown exponentially, to become one of the largest privately owned public transport systems in the world.[1]

Today, the minibus taxi handles 23% of all transport trips and 72% of public transport trips in the city of Johannesburg. According to the Johannesburg Integrated Transport Plan 2003-08, overall rider dissatisfaction is very high, due to a very poor safety record, inadequate facilities, quality and cost of services. However, in terms of travel time and off-peak frequency, it outperforms all other modes. Serving low-income segments of the population, the industry has operated with no government subsidies. In recent years, the government has taken action to formalise and provide a regulatory structure for the industry through a "Special Legislation Process", registration of all associations and operators, and preparation of standard constitutions and codes of conduct for taxi associations and their members.[2]

As Johannesburg's Rea Vaya Bus Rapid Transit system has been brought into operation, distress within the taxi industry over market share (e.g. 575 taxis must be withdrawn from affected routes) has resulted in violent reaction from taxi operators and drivers. Through skilful negotiations, agreements are being reached for displaced taxi drivers to be employed as Rea Vaya drivers or station personnel. Taxi owners are to become shareholders in the bus operating company.[3]

1. Extract from City of Johannesburg (2006), *Reflecting on a Solid Foundation, Building Developmental Local Government 2000-05*.

2. City of Johannesburg Integrated Transport Plan 2003-08, updated 2004.

3. Interviews with City of Johannesburg personnel and Colleen McCaul Associates, South Africa.

Crime rates limit public transport ridership and Gauteng's "attractiveness" in general. According to the *National Transport Survey*, 60% of train users and 35% of bus users were dissatisfied with security when walking to stations. Though Gauteng's reported homicide rate decreased from 5 852 in 1994 to 3 444 in 2010, there are recorded increases in several categories tracked by the Crime Information Analysis Centre of the South African Police Service (SAPS). From 1994-1995 to April 2009-March 2010, the following increases were recorded in Gauteng: total sexual crimes (+34.2%), common robbery (+73.4%), malicious damage to property (+33.6%), drug-related crime (+93.9%), and driving under the influence of alcohol or drugs (+80.5%) (South African Police Service, 2005; 2010).

Differences in commuting persist across socio-economic lines in Gauteng, though they are far less marked than the past. Residents who live in Gauteng's low-income neighbourhoods have higher commuting times than those who live in higher-income neighbourhoods. A much lower proportion of very wealthy residents (those with monthly household incomes over ZAR 51 201 per month) are able to reach work within 15 minutes, and almost 6% of the poorest commuters take over 2 hours to reach their place of work. Equally important, commuting data illustrates the commuting burden on residents in public housing projects, which tend to be located in peripheral locations in Gauteng. Only 9% of RDP beneficiaries can reach work within 15 minutes, and their average time to work is 39 minutes, 5 more minutes than the average commuting time in Gauteng. Furthermore, the improvements in travel times in low- and middle-income areas should be noted. In 1975, average travel times of between 61 and 87 minutes were noted. The corresponding times in 2000 were 52 and 64 minutes respectively.[52]

Notes

1. The period referred to is 1995 to 2007. The initial year (1995) was chosen because it is the first available data point from the Statistics South Africa database. The ending year (2007) was chosen because the years from 2008 and onwards show declines in GDP due to the global crisis and may not be representative of larger trends. However, after a short-lived decline of -1.2% in 2009 with respect to 2008, the economy seems to be in recovery, growing at 6.2% over the 2008-10 period, or at a 2.2% annual average.

2. South Africa's Gini coefficients have continued to grow over the years: 0.66 in 1993, 0.68 in 2000 and 0.7 in 2008 (Leibbrandt et al., 2010).

3. The *UN Population Database* assumptions include six different scenarios that are a combination of the medium variant with respect to the 1998 revision, which implies varying fertility rates, levels of ageing, and migration. For further information, see: *www.un.org/esa/population/publications/ReplMigED/chap3-Approach.pdf*.

4. If, for example, a slice of the northern footprint is included, the population increases considerably. Thembisile Local Municipality adds 257 000 people, Dr. J.S. Moroka LM adds a further 244 000, Madibeng another 347 000. These three local municipalities add nearly another 1 million people to the Gauteng city-region population. An inter-linked set of variables need to be analysed – transport (goods and people), economic activity, work-seeking, leisure and so on – to develop a robust basis for understanding the footprint of the Gauteng city-region. Currently, the Gauteng City-Region Observatory is developing such a model.

5. GeoTerraImage defines urban in their satellite photography as "All built-up areas, including all aspects of residential, commercial, industrial, mining and transportation infrastructure, in both urban and rural environments. Represents primarily a non-vegetated, artificially sealed surface, except for vegetated gardens not otherwise identified as urban-trees or urban-grasslands. Also includes all major road and rail networks, recently cleared, nonvegetated areas being prepared for urban development, and rural farm infrastructure (including greenhouses, propagation tunnels and chicken/pig batteries)" (GeoTerraImage, 2009).

6. The Gauteng City-Region Observatory (GCRO) is acknowledged for extracting, and furnishing to the OECD, the Quantec data used at various points in this *Territorial Review*. Under the auspices of a license for Quantec data held by the University of the Witwatersrand (Wits) where GCRO is based, which license was jointly paid for by GCRO and the Wits Corporate Strategy and Industrial Development (CISD) Research Programme, GCRO accessed selected Quantec datasets and provided these to the OECD as excel tables for the purposes of mapping and analysis. Quantec is referenced as the original source of the data wherever applicable.

7. The Gauteng City-Region Observatory notes that this image has been remodelled using the source data provided by the Department of Economic Development based on EMME2 modelling from the *Gauteng Transport Study 2000*.

8. The accumulation of wealth attracted opportunity seekers from within South Africa, as well as from Lesotho, Mozambique and as far afield as Australia, the United Kingdom, Canada, China and India. Many others came as migrant workers under oppressive and partly forcible conditions.

9. Migrants to Gauteng were most likely to come from Limpopo, followed by KwaZulu-Natal. The *Community Survey* suggested that while 5 801 000 Gauteng residents were born in the province, they were joined by 1 051 000 from Limpopo, 602 000 from KwaZulu-Natal, 494 000 from the Eastern Cape, 452 000 from Mpumalanga, 386 000 from North West, 356 000 from Free State, 132 000 from Western Cape and 78 000 from Northern Cape (most Northern Cape out-migrants go to the Western Cape).

10. The pattern of labour circulation continues, with many migrants labouring for what they hope will be a short period in which they can save to send remittances to their families. According to one analysis, a third of foreign migrants from some countries expect to be living somewhere else within two years.

11. Translated as the "ridge of white waters".

12. The logic of this system was to dispatch surplus labour to the countryside, and thereby spare cities the costs of "social reproduction" of many would-be residents and their families, except those deemed necessary to serve growing mines and factories.

13. Pretoria-Witwatersrand-Vereeniging (PWV) Transportation Survey, 1975. This was based on 10 080 household surveys in the Pretoria area and a further 5 500 in the rest of the PWV area. Data quoted in Gauteng Department of Roads and Transport (2006: 31). The *GTS 2000* included six years of research and modelling, starting with a first working paper in September 2000 and a major survey in 2002-03. Most of the research, analysis and modelling was completed between 2004 and 2006.

14. The Sigma-convergence indicator is calculated using a standard deviation of logged GDP per capita values for regions in a country in this case.

15. According to Rodrik, wage pressures have also been a factor explaining de-industrialisation. According to that view, real wages have remained relatively high for South Africa's level of income, which has made job creation difficult and has hurt competitiveness. According to OECD labour costs statistics, South Africa's unit labour costs grew annually at an average rate of 6.9% between 1995 and 2008 (and at 5.5% in the manufacturing sector). These costs were very low after apartheid ended and have naturally increased, but they have remained much lower than those paid in OECD member countries.

16. Highly skilled includes top management, senior management and professionally qualified and experienced specialists and mid-management. See *www.sablimited.co.za/sablimited/action/media/downloadFile?media_fileid=101*.

17. For more details, see Statistics South Africa (2010a).

18. It is important to note that this is just "completed schooling" and does not refer to those individuals who completed schooling and also have a tertiary qualification. Caution is required given this ambiguity, given that those with a master's degree, etc., can also be counted as having completed schooling. If this cohort is included, the number of those who had completed schooling rose from 38.6% of the population aged 25 and over in Gauteng in 2000, to 50.8% in 2010. This compares with 40% of the national population 25 and over in 2010.

19. The TIMSS studies measured Grade 8 learning achievement in mathematics and science in several countries in 1995, 1999 and 2003. South Africa's performance was disappointing in both the 1999 and 2003 studies, returning lower average test scores in both mathematics and science than all other participating countries (including other African countries, such as Morocco, Tunisia and Botswana). Out of an imputed maximum score of 800, the average South African mathematics score was 275 in TIMSS 1999 and 264 in TIMSS 2003. The average science score was even lower: 243 in TIMSS 1999 and 244 in TIMSS 2003 (OECD, 2008d).

20. High-tech is defined as those manufacturing categories that are R&D intensive in the predominantly developed OECD member countries.

21. This Review employs the OECD classification of manufacturing industries based on technology as defined by the *OECD Science, Technology and Industry Scoreboard* (2005). High-technology industries include: aircraft and spacecraft; pharmaceuticals; office, accounting and computing machinery; radio, TV and communications equipment; and medical, precision and optical instruments. Medium-high technology industries include: electrical machinery and apparatus; motor vehicles, trailers and semi-trailers; chemicals excluding pharmaceuticals; railroad equipment and transport equipment; and machinery and equipment. Medium-low-technology industries include: building and repairing of ships and boats; rubber and plastics products; coke; refined petroleum products and nuclear fuel; other non-metallic mineral products; and basic metals and fabricated metals products. Low-technology industries include: manufacturing; recycling; wood, pulp, paper, paper products; printing and publishing; food products; beverages and tobacco; and textiles; textile products; leather and footwear.

22. Gauteng province has been South Africa's innovation hub since the 19th century, when gold and mine deposits were discovered around the Witwatersrand. The massive movements of people in search of these precious stones, and the ensuing colonial war of conquest and dispossession, necessitated infrastructure such as road and railway system to carry people and other essential supplies. The expansion of the mines in the Transvaal led to the establishment of the South African school of mines, known today as the University of the Witwatersrand. Other major institutions that were essential to science and technology and overall economic development were also created in the 19th and 20th centuries: Iron and Steel Corporation of South Africa (ISCOR), Eskom, Onderstepoort Veterinary Institute, the Council for Scientific and Industrial Research (CSIR), as well the other science councils, some of which were offshoots of the CSIR.

23. Business includes state-owned enterprises (SOEs) such as Transnet, Eskom and the PBMR.

24. The training institutions include: the University of Johannesburg, Tshwane University of Technology, Vaal University of Technology, the University of Pretoria, and the University of South Africa. National Science Councils in the province, collectively with diverse research fields, some of which are state-owned are: ARC, the Council for Geosciences (CGS), CSIR, HSRC, Mintek, Standards South Africa (STANZA), the National Institute for Virology (NIV), the National Health Laboratory Service (NHLS), the Meraka Institute (CSIR), the Africa Institute of South Africa (AISA), the South African Environmental Observatory Network and the South African Biodiversity Information Facility.

25. By comparison, the business sector employs 3 199 FTE researchers in the Gauteng city-region.

26. The rate of incoming foreign direct investment in South Africa is the highest in Africa, but on the low tier of the OECD, ahead of Ireland and Greece, but below Finland and Portugal (OECD, 2010e).

27. This includes R&D by Gauteng-based higher education institutions that is not conducted within Gauteng's borders.

28. The first *Innovation Survey*, modelled on the European Union (EU) *Community Innovation Survey* (CIS), was done in 2001 and covered the period 1998-2000.

29. All data in this section come from Statistics South Africa *Labour Force Surveys*, as reproduced by Quantec Research.

30. However, in the first quarter 2011 *QLFS*, 142 000 persons in Gauteng were involved in non-market activities (subsistence farming: 21 000; fetching water or collecting wood: 22 000; producing other goods for household use: 75 000; construction or major repairs to own household: 35 000; and hunting or fishing for household use: 1 000). Even leaving aside the question of whether fetching water or collecting wood counts as employment, the total would not add so substantially to the tally of the employed (3 999 000), as to make more than a few percentage points difference to the unemployment rate.

31. The relevant question in the *LFS* is Q6.1: "Did [person] … grow or help to grow any produce … or help to keep any stock … for sale or for household use during the last 12 months?"

32. Subsistence farming refers to Variable Q59 in the *Quarterly Labour Force Survey*, "Did you do any work on your own or the household's plot, farm, food garden, cattle post or kraal or help in growing farm produce or in looking after animals for the household's own consumption?"

33. This is not a minor matter. Suppose one quarter of those without jobs last searched for a job last week, one quarter in the previous week, one quarter in the week before that, and one quarter in the week before that. This is not an unreasonable set of suppositions in a high-unemployment, labour-surplus economy. By stretching the job-seeking reference period from one to four weeks, one would quadruple the unemployment rate.

34. In the shift to non-permanent jobs, one rising source of employment has been call centres, seen as a new niche for job creation. In line with international trends, the South African call centre industry has grown dramatically since the start of the millennium. Just over half of these centres are located in Gauteng. In 2007, Johannesburg was proclaimed to be the largest base for call centres on the African continent, with Cape Town the second most popular location. The City of Johannesburg's Sector Development Programme has earmarked the business processing outsourcing (BPO) sector, which includes call centres, as one of five sectors that will benefit from support programmes (McKinsey & Company, 2005).

35. To capture the picture of what often seems to happen, it is worth quoting a government official who studied the situation in Gauteng. "Labour brokers are now hiring illegal foreigners. At the end of the month, the broker meets the workers on a street corner and 'pays' them. Before meeting the workers, he calls the police and they arrive shortly after he has started paying them. Because the workers are not legal, when they see cops approaching, they run away. So the labour broker gets away with hiring illegal migrants, with exploiting them and not paying them" (Benya, 2008).

36. In job security, South Africa scored 26th out of 94 countries and for representation security, 7th out of 99 countries. The procedure entailed ranking a country according to its policies, its institutions for putting the policies into effect, and the outcome of those policies, and to create a set of indexes (ILO Socio-Economic Security Programme, 2004).

37. For example, see Eduardo Reese's "Sustainability and Urban Form: The Metropolitan Area of Buenos Aires, in Megacities", in A. Sorensen and J. Okata (eds.) (2011), *Urban Form, Governance, and Sustainability Library for Sustainable Urban Regeneration*, Vol. 10, Part III, pp. 373-394.

38. Informal employment refers to "persons who are in precarious employment situations irrespective of whether or not the entity for which they work is in the formal or informal sector. Persons in informal employment therefore consist of all persons in the informal sector, employees in the formal sector and persons working in private households who are not entitled to basic benefits such as pension or medical aid contributions from their employer, and who do not have a written contract of employment. The informal sector has the following two components: *i)* employees working in establishments that employ less than five employees, who do not deduct income tax from their salaries/wages; and *ii)* employers, own-account workers and persons, helping unpaid in their household business, who are not registered for either income tax or value-added tax" (Statistics South Africa's *Labour Force Survey, Quarter 3, 2009*: xvi).

39. The number of people doing informal jobs of one kind or another is surely substantially underestimated. To the extent that they use workers "off the books", this might be done in collusion with workers, who in turn prefer to be prudent by not saying they are working when questioned by enumerators who seem to them to be government officials. This particularly applies to migrants without identity documents or work permits. There are no reliable statistics on the number of foreigners living and working in the country. In certain sectors, such as construction, foreign workers may account for between a quarter and a half of all the employed (Rees, 1999). Schneider (2002) calculates that, at just over a quarter of GNP in 1999-2000, South Africa has the smallest "informal economy" of the 23 African countries analysed, but for the reasons stated here, these comparisons omit many workers involved in informal labour.

40. The results of Grant (2010) are based on 320 completed questionnaires from residents of six prominent Soweto informal settlement areas (Kliptown, Klipspruit, Emdeni, Dobsonville [Snake Park], Ellis Motsoaledi and Midway).

41. A Theil index is a statistical measure used to measure inequality and has the unique characteristic of being decomposable, making it possible to pinpoint which factors drive inequality.

42. For an overview of these debates, see Everatt (2003).

43. South Africa's past is a racist one, and although it now has a robust democracy, race continues to dominate public discourse and policy making. Notably, racial classification has remained in place, in part in order to measure progress on development and the correction of historical inequities in the provision of benefits and services. The country has four official race groups: African, coloured, Indian and white. The clumsy admixture of types of noun is indicative of the ongoing debate (and confusion) about the salience of race in a country whose Constitution commits it to a non-racial, non-sexist democracy, coupled with the need to ensure that those

formerly disadvantaged because of their race have first claim on the resources of the democratic state.

44. The population, analysed by race, is also unevenly distributed across the Gauteng city-region. In some municipalities, such as Thembisile or J.S. Moroka, Africans comprise 99.7% and 99.9% respectively. But in the municipalities closer to the wealthy core, the racial profile changes. Johannesburg, for example, has 75% Black Africans, 6% coloured, 4% Indian and 15% whites; and in Tshwane, whites account for 22% of the population. By 2001, the data suggests, Black Africans, coloured and Indian citizens had begun to move out of the townships from which they were previously unable to move by law, but only slowly. Overwhelmingly, each of these populations remained heavily concentrated in the areas formerly designated for them by apartheid (Gauteng City-Region Observatory, 2010a).

45. In Philadelphia, spatial constraints on job searches, which lead to weak information on job opportunities, were responsible for between 33% and 54% of the difference between white and African-American employment rates (Ihlanfeldt and Sjoquist, 1991). In Los Angeles, it has been found that the locations where people search for employment accounted for 40% of the difference between white and African-American employment rates (Raphael and Stoll, 2000, cited in Naudé, 2008).

46. The rental category includes rentals from housing associations, public/municipal/council rentals, sub-tenant/sublets, and rentals of informal dwellings/shacks.

47. The Department of Human Settlements makes available recent statistics on units "completed and in the process of completion", but not on subsidies allocated. See *www.dhs.gov.za/Content/Stats/Housing%20Delivery%20Stats.htm.*

48. The eight-year requirement is specified in Section 10 of the Housing Act (1997).

49. Note that not all informal dwellings are in informal settlements. There are many rudimentary shacks in the yards of formal houses. In Gauteng these backyard dwellings make up a very large proportion of informal housing.

50. For South Africa as a whole, household size is declining. The average number of persons per household dropped from 4.6 per household in 1996 to 3.9 in 2007. This reflects in particular the ability of black households to divide and move, rather than being penned into hard-won, and usually larger multi-generational households in *bantustans* and designated urban ghettoes.

51. This viability analysis was undertaken for the Department of Planning and Local Government, the Development Bank of Southern Africa, the Department of Water Affairs and Forestry and National Treasury under the Municipal Infrastructure Investment Framework and Municipal Fiscal Framework Review projects (cited in Department of Provincial and Local Government, 2005).

52. PWV Transportation Survey (1975) and Gauteng Department of Roads and Transport (2006).

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Chapter 2
Addressing inequality and expanding economic opportunity

This chapter focuses on economic policy and outlines initiatives that build on the progress the Gauteng city-region has made towards a more inclusive economy. Since the end of the apartheid era, the windows of economic development have been opened for a large number of citizens in the city-region, but gaps remain nevertheless. The chapter reviews the result of recent attempts to reduce the exceptionally high level of unemployment, raise tertiary education attainment rates, and reduce high levels of informal housing and infrastructure backlogs. A section dedicated to spatial inequality discusses Gauteng's central dilemma: how to provide for its booming population an affordable stock of housing and transport infrastructure that can bridge the service gaps inherited from apartheid. It recommends the adoption of a suite of policies to increase the supply of modest-cost housing and improve mobility through transport-oriented development and growth management. With a view to confronting economic inequality, the chapter includes a labour market policy analysis and stresses the need to improve labour market security for all workers. Given Gauteng's dominance as the centre of African innovation, the chapter recommends a range of policies to capitalise on the city-region's dynamism, e.g. *improving productivity growth, expanding small businesses, developing new green growth sectors, and addressing bulk infrastructure needs. Taking account of the fluidity of the economic system in Gauteng and increasing inter-municipal commuting, the chapter proposes that policy approaches be grounded in a city-region framework.*

Within Gauteng, one of the most unequal metropolitan regions in the world, a more inclusive economic agenda could better link economic development to social cohesion. The city-region concentrates 21% of South Africa's population and generates 33% of national wealth. In the last decade, Gauteng's performance in economic growth outperformed that of the nation. Increasing investment capacity has improved the general performance of the economy and helped foster segments of the economy that compete successfully on the international market. Nonetheless, expectations concerning Gauteng's economic and social development have not been fully met, and weaknesses in economic performance need to be addressed, in particular:

- economic performance has not kept pace with that of other city-regions;
- the city-region remains heavily reliant on fossil fuels for energy production and transport, which has compromised environmental quality and limited a shift towards a greener economy;
- unemployment remains at exceptionally high levels;
- the low attainment rate in tertiary education, although it has dramatically improved since the end of apartheid, constrains productivity and the economy's evolution towards more advanced services; and
- high levels of informal housing and infrastructure backlogs persist, trapping a large part of the city-region in the old regime's spatial structure and limiting its mobility.

Despite these challenges, Gauteng's "first wave" of reforms in infrastructure development, skill upgrading, and educational access illustrate that it is capable of achieving rapid progress. As noted in Chapter 1, the windows of economic development since apartheid have been opened for a large number of citizens. Institutionally, new departments of economic development have been created and charged with advancing a raft of programmes, from the support of advanced research to community economic development. Access to basic infrastructure – flush toilets, piped water, heating and lighting – greatly increased after the end of apartheid, along with access to education and training.[1] This adaptability augurs well for the next wave of economic development.

To move Gauteng to the next level, a second generation of economic development policies must respond to three cardinal challenges. First, to ensure that growth benefits Gauteng's residents, specific measures to confront economic inequality could be mainstreamed and expanded. Along more traditional lines, these would include an enlargement of the existing skills upgrading programmes and youth apprenticeship programmes. However, given the dominance of the informal economy in several neighbourhoods and its potential to absorb residents who cannot find jobs in the regulated sector, economic policies could better support multiple livelihood strategies. Strategies across the formal-informal continuum could be encouraged in light of the fact that suggests that unemployment in Gauteng will continue to be high. National policies at present aim to eliminate the second economy,[2] but the evidence suggests that its size in Gauteng is considerable and that under the current economic model, the formal economy is incapable of generating sufficient jobs.[3] Given the projected growth of the population, particularly in informal settlements, programmes intended to reduce economic inequality could be improved by including a focus on the assimilation of immigrants.

Second, Gauteng's economy would benefit from building more inclusive neighbourhoods – both spatially and economically – by building on the momentum of its progress in housing and transport. In terms of housing policy, this section analyses the question from both the city-region and the national level. The Review recommends the following policies at the sub-national level: an evaluation of the regional affordable housing stock; increasing the availability of ready-made plans to affordable housing developers that meet city regulations; engaging non-governmental affordable housing developers; and introducing a new range of products such as rent to buy, small mortgages, instalment sales, shared-equity mortgages, and matched savings. Housing micro loans could be offered at a much greater volume. At the national level, the section calls for a prioritisation of informal settlement upgrading and a resolution of concurrent mandates over land management shared between provincial and municipal governments. Finally, it acknowledges and supports the government's stated objective to set aside well-located public land for low-income housing.

After the introduction of the Gautrain and Johannesburg's Bus Rapid Transit (BRT) programme, low-income neighbourhoods stand to gain from the creation of inter-firm linkages throughout Gauteng, and not only through endogenous strategies aimed at isolated townships. To ensure that Gauteng's spatial structure helps rather than hinders economic growth, moderate-income housing markets could be better facilitated through the introduction of additional tools. Such initiatives would help curtail Gauteng's divisive spatial mismatch. Changes in regulations and the development of public transport are crucial if mobility within the region is to be improved. Transport deficiencies are a major obstacle to the efficient functioning of the labour market and contribute to high unemployment, search costs and reservation wages in the region.

Third, in addition to reducing economic and spatial inequality, initiatives are needed to expand economic opportunity. The business environment in South Africa, especially for start-ups, and the regional innovation system could be enhanced. Building on Gauteng's national dominance in patenting and its large share of the services sector, a range of policies could be introduced to capitalise on the city-region's dynamism. The section will touch upon green innovation policies and propose policies that encourage a "bottom-up" emergence of new sectors. The high infrastructure costs that curtail economic opportunity in landlocked Gauteng will also be assessed.

2.1. Synopsis of economic development and spatial strategies in Gauteng

A mosaic of different policies across the national, provincial, and local scales govern economic development policy in the Gauteng metropolitan region. It is important to note that in South Africa, the current economic agenda is centralised at the national level though provinces and municipalities have begun to play a stronger role. Regional development is seen as a concurrent national and provincial function in which the national government plays the leading role. In this configuration, a province builds links upwards to the overarching macroeconomic policy framework at the national level and downwards to the more detailed local economic development plans at the municipal level. Limited amounts of funding are at present granted to provinces for provincial roads and minor industrial-sector support (agriculture and tourism). In effect, economic development constitutes approximately 12% of total provincial spending, spanning such diverse areas as agriculture, industrial promotion, tourism, trade, regional development and planning, and urban and rural development (Republic of South Africa, National Treasury, 2007, cited in Robinson, 2007).

National economic and spatial policies

The much-anticipated New Growth Path policy, endorsed by the Department of Economic Development of South Africa on 23 November 2010, clearly states the current government's national economic objectives.[4] The New Growth Path is intended to address unemployment, inequality and poverty in a strategy that sets a target of creating 5 million jobs in the next ten years. This target is projected to reduce unemployment from 25% to 15%. As a first step, government will focus on unlocking the employment potential in six key sectors and activities. State agencies are currently working on implementation plans for these six sectors, which include:

- infrastructure, through the massive expansion of transport, energy, water, communications capacity and housing, underpinned by a strong focus on domestic industry to supply the components for the build-programmes;
- the agricultural value chain, with a focus on expanding farm output and employment and increasing the agro-processing sector;
- the mining value chain, with a particular emphasis on mineral beneficiation, as well as on increasing the rate of minerals extraction;
- the green economy, with programmes in green energy, component manufacture and services;
- manufacturing sectors identified in the Industrial Policy Action Plan 2, and
- tourism and certain high-level services (Department of Economic Development of South Africa, 2010).

The New Growth Path policy can be further distinguished from previous national economic strategies by its focus on the green economy and the emphasis it gives to partnering with other African economies. With respect to the green economy, for example, the New Growth Path projects a potential for 300 000 additional direct jobs by 2020 to "green" the economy, with 80 000 in manufacturing and the rest in construction, operations and maintenance of new environmentally friendly infrastructure. The New Growth Path stresses that additional jobs will be created by expanding the existing public employment schemes to protect the environment, as well as increasing production of biofuels. Regarding its role in the African economy, the New Growth Path "commits South Africa to work in partnership with other countries on the continent to build a single African integrated economy embracing 1 billion consumers, and to focus immediately on expanding economic links with the rest of the continent" (Department of Economic Development of South Africa, 2010).

The role of regions in fostering national economic growth has been notably absent from South Africa's main strategic documents for national economic growth. Since the end of the old regime, the governments have paid much attention to enhancing the country's unity and macroeconomic stability. In raising the issue of regional policy, it should be remembered that apartheid included a regional spatial strategy. At the national level, the creation of homelands/*bantustans* confirmed colonial possession of prime territory for whites, including the most productive agricultural land. Apartheid also secured the major cities and their industries for white domination. Within urban areas, race-based spatial strategies entrenched racial segregation in the interests of the ruling minority. The challenge of the post-apartheid period was to create new spatial opportunities, while eroding past inequities. However, the way this challenge was taken

up was by the removal of overtly discriminatory legislation and not, at least initially, through overtly territorial or regional strategies. Until recently, the spatial economy was not featured on the national development agenda, and national economic policy strategic documents, including the 2005 Accelerated and Shared Growth Initiative for South Africa (AsgiSA), did not sufficiently take into account the spatial dimension in laying out how to proceed towards macroeconomic stability and rapid growth. Several other national policies did not include an explicit spatial emphasis, but nonetheless have indirect regional effects.[5]

A gradual shift towards a spatial approach emerged with the 2003 Cabinet approval of the National Spatial Development Perspective (NSDP). This document, first discussed in 1996 in the national Reconstruction and Development Programme, released in 2003 and updated in 2006, clearly singles out the regions as reservoirs of growth and the main target for the implementation of public policies to alleviate poverty. The objective of the NSDP is to "fundamentally reconfigure apartheid spatial relations and to implement spatial priorities that [while promoting economic growth] meet the constitutional imperative of providing basic services to all and alleviating poverty and inequality" (Presidency of the Republic, 2006). Despite its high-level status, the impact of the NSDP has been limited so far. It has not been incorporated into national policy and budget prioritisation, and its analysis of differential regional opportunities has therefore not influenced the allocation of funding for particular sub-national territories or the implementation of targeted development initiatives.

There is some recognition of cities' role in fostering national growth and the need for a national policy for urban regions, as indicated by the establishment of the National Planning Commission in 2009. This builds upon previous efforts, such as the Departments of Provincial and Local Governments, Housing and the Presidency internal draft of a National Urban Development Framework (NUDF) and the ongoing work of the South African Cities Network, a membership organisation of the nine largest municipalities and other urban stakeholders. However, national urban policy initiatives have yet to be fully connected to existing job creation and economic development strategies at the national level.

Provincial initiatives

The Gauteng Provincial Government's Employment, Growth and Development Strategy for 2009-14 (GEGDS), adopted in May 2010, presents the provincial government's over-arching strategic focus for economic development. It sets out objectives with respect to local economic development, bulk infrastructure, skills development and capacity building, green economy, sustainable resource usage and spatial planning.[6] The strategic interventions spelled out in this document are organised into five "strategic pillars" (Table 2.1). The five pillars are:

- transforming the provincial economy through improved efficiency (economic dimension);
- sustainable employment creation (economic dimension);
- increasing economic equity and ownership (equality dimension);
- investing in people (social dimension); and
- sustainable communities and social cohesion (social dimension).

These five priorities are designed to ensure convergence between the economic and social strategies of government and are underpinned by environmental strategies intended to ensure sustainable use of resources. The specific strategies within each of these pillars are developed by separate provincial departments and are, in theory, co-ordinated by the GEGDS. The emphasis of the GEGDS on mediating and co-ordinating between a large body of provincial policies, including the Gauteng Spatial Development Framework (GSDF)[7] and many other measures,[8] distinguish it from previous provincial economic development strategies (Gauteng Provincial Government, 2010b).

Together, these policies reflect a clear agenda to capitalise on the economic strength of the region and to create a much more environmentally efficient and inclusive regional economy. Given the historical trajectory of the regional economy, this is an ambitious but necessary agenda. The following quote from the GEGDS makes clear what it seeks to achieve. As a goal, GEGDS aims: "To stimulate redistributive economic development to create decent work, sustainable livelihoods and reduce income inequality." It suggests that this outcome depends on adopting three priority themes to move towards a clean, labour-absorptive and diverse economy.

Table 2.1. **Gauteng's Employment, Growth and Development Strategy (GEGDS)**

	Pillar 1: Transforming the provincial economy through improved efficiency	Pillar 2: Sustainable employment creation	Pillar 3: Increasing economic equity and ownership	Pillar 4: Investing in people	Pillar 5: Sustainable communities and social cohesion
Cross-cutting/ supporting drivers	Innovation and the knowledge economy Green Economy and sustainable resource usage (energy efficiency, water and waste management) Infrastructure: strategic, socio-economic and bulk	Green jobs	Community-led local economic development	Skills development and capacity building	Spatial planning
Ordinary drivers	Industrial and sector development	Direct employment creation – CWP, EPWP II and YEI	Support for SMMEs and formal business	Social assistance and social insurance	Sustainable mobility
	Transport and logistics	Labour-absorbing sectors	Support for co-ops and informal business	Access to health care	Safe communities
	ICT	Preventing job losses in distressed sectors	BBBEE	Quality basic education	Rural and agricultural development and food security
	Ease and cost of doing business	–	Strategic procurement	Socio-economic infrastructure	–

Source: Gauteng Provincial Government (2010), "Gauteng Employment, Growth and Development Strategy", Gauteng Provincial Government, Johannesburg.

The GEGDS creates three priority interventions to move Gauteng towards an inclusive, innovating, and greening economy. The three priority transitions are:

1. Becoming an innovating economy, as reflected in the fact that existing resources are used more productively. Innovation is here defined to extend well beyond the traditional focus of high-tech R&D labs and science parks and to include ICT and socio-economic innovations, as well as environmental breakthroughs that will support the new focus on green technology, green jobs and renewable energy.

2. Becoming a green economy in the sense that existing resources are used in a more efficient, environmentally friendly and sustainable manner.
3. Becoming an inclusive economy that fosters greater social engagement through the strategic deployment of socio-economic and bulk infrastructure; or what is often termed an "infrastructure-led" growth strategy (Department of Economic Development, 2010: 31).

To measure the successful implementation of the GEGDS, three high-level targets have been adopted, namely: *i)* increase the economic growth rate; *ii)* reduce the unemployment rate; and *iii)* reduce the poverty level for those who live under the minimum living level.

Though the GEGDS raises the bar on inter-sectoral (horizontal) co-operation and co-ordination, it is less clear how this policy will support the range of economic development initiatives pursued by municipalities in the Gauteng city-region. Municipal authorities implement a wide range of economic development programmes, encompassing community economic development, downtown revitalisation and targeted support to key sectors. Other economic development initiatives include policies to formalise street trading/micro-retailing, efforts to improve access to broadband telecommunications, and targeted support to sectors such as business process outsourcing, cross-border shopping, hospitality and tourism, fashion, arts, culture and entertainment, etc.[9] The GEGDS lacks any discussion of connectivity or complementarity with the single most important economic planning instruments available to municipalities, integrated development plans (IDPs). These five-year management plans aim to link the municipal budget to a council's strategic plan and sectoral plans, including spatial frameworks, transport plans and infrastructure.

2.2. Confronting spatial inequality

Gauteng's central dilemma is how to provide for its booming population an affordable stock of housing and transport infrastructure that can bridge the service gaps inherited from apartheid. The situation is critical: Gauteng's housing backlog increases by over 50 000 units per year. A continuum of different tenure and housing arrangements – from rental to full ownership – is needed to accommodate a variety of housing needs. New subsidised housing projects, hampered by inadequate funds, have been located in peripheral job-poor zones. This has tended to trap communities in sub-optimal employment circuits, reinforcing the spatial mismatch between workers' residences and employment. Because they have few affordable options, residents have entered the informal housing market: 23% of Gauteng's households now live in informal dwellings far from job opportunities. Unfortunately, tax incentives and levy rebates for businesses willing to locate in newly developed informal settlements have been insufficient to attract the level of investment necessary to revitalise these areas.

The delivery system calls for urgent improvement, both in terms of providing land in better locations and increasing governments' leverage over unfettered and segregated land markets. Overall policy governing Gauteng's urban development has fallen far short of creating affordable, economically vibrant and accessible neighbourhoods. Despite the impressive number of houses built on the outskirts of the city in the post-apartheid years, the bricks and mortar approach to low-income housing delivery continues to result in unexpected side effects and frustration. In contrast to a mere infrastructure-driven approach, this will require changes in legal parameters and regulatory approaches. In

addition, this agenda should aim to increase the environmental sustainability and available amenities of the city, which are critical to maintaining Gauteng's competitive edge. The reform of dysfunctional policies underlying the built environment would need to be embodied into a cross-sectoral strategy aligned with housing policies. In essence, such a strategy would:

- expand affordable and well-located housing; and
- improve mobility and access to opportunities and urban amenities by continued support for public transport and growth management.

These efforts are critical, given apartheid's enduring legacy for land and urban development in Gauteng. Apartheid urban planning left a low-density, discontinuous, mono-functional, racially segregated and auto-dependent landscape, and the economic and social forces that emerged during the apartheid era are deeply embedded in social and institutional practices that frequently defeat progressive policy aspirations (Low, 2003; Turok, 2001). The Less Formal Establishment of Townships Act (113 of 1991), for example, entrenched apartheid-style land development and reinforced differential land development rules for poor areas of the city (Box 2.1).

Box 2.1. **A brief history of apartheid planning in South Africa and its aftermath**

Dense layers of legislation, norms, rules and institutions were instituted to organise, plan and finance the apartheid city. The process of segregation of the "African" and "coloured" communities took place in several stages: formative policies included the 1901 emergency measures; the forced removal of Africans in Johannesburg to their first "native location" at Klipspruit in 1904; the Native Urban Areas Act of 1923; and the 1934 Slums Act, which sought to institute residential segregation under the pretext of public health concerns. Historically, African townships had no commercial zoning, since the Native Urban Areas Act was intended to ensure that the black population funded its own urban development through municipal monopolies on retail and brewing. During World War II, the rate of population growth, especially among the "African" group, rose sharply due to an increased demand for labour. Consequently, a rapid growth of informal squatting ensued, stoking white anxieties over the "native question". When the Herenigde Nasionale Party ("Purified National Party") took power in May 1948, it passed sweeping apartheid legislation, most notably the Group Areas Act (1950) and the Reservation of Separate Amenities Act (1953). The rules of apartheid racist planning frameworks were clarified in 1952, in a speech in Parliament by the then Minister of Native Affairs, Dr. Hendrick F. Verwoerd, who stated:

1. Every town or city, especially industrial cities, must have a single corresponding black township.
2. Townships must be large, and must be situated to allow for expansion without spilling over into another racial group area.
3. Townships must be located at an adequate distance from white areas.
4. Black townships should be separated from white areas by an area of industrial sites where industries exist or are being planned.
5. Townships should be within easy distance of the city, preferably by rail and not by road transport.
6. All race group areas should be situated so as to allow access to the common industrial areas and the CBD without necessitating travel through the group area of another race.

Box 2.1. **A brief history of apartheid planning in South Africa and its aftermath** *(cont'd)*

7. There should be suitable open buffer spaces around the black township, the breadth of which should depend on whether the border touched on densely or sparsely populated white areas.
8. Townships should be located at a considerable distance from main, and more particularly national roads, the use of which as routes for local transport should be discouraged.
9. Existing wrongly situated areas should be moved (cited in Williams, 2000).

From the 1960s to the 1970s, the Group Areas Act facilitated large-scale slum removal and relocated black communities from the inner-city areas to the townships. At the same time, strict control on the inflow of "African" and "coloured" people was enforced, linked to a series of legal and financial instruments that, in practical terms, suppressed the economic development of townships by obliging black communities to shop in white CBD areas. One product of this system was the creation of racially demarcated local government bodies. In Johannesburg, for instance, until 1994, the greater Johannesburg region was divided into 13 separate authorities presided over by racially separate local governments with their own fiscal, legal, administrative and planning systems.

Map of Johannesburg under apartheid

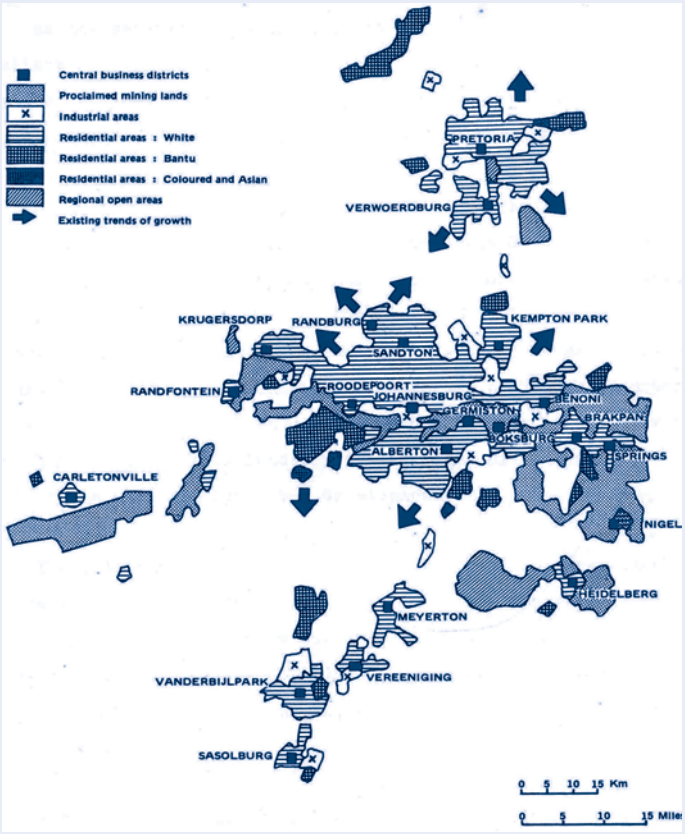


Figure source: Republic of South Africa, Department of Planning and the Environment (1974), "Proposals for a Guide Plan for the Pretoria/Witwatersrand/Vereeniging (PWV) Complex", Government Printer, Pretoria.

Box 2.1. **A brief history of apartheid planning in South Africa and its aftermath** *(cont'd)*

As apartheid was being dismantled in 1991, the Less Formal Township Establishment Act (LFTEA) was passed to fast-track land development for the poor. This allowed developers to ignore underlying zoning scheme requirements, building regulations and other construction standards. Once the member of the Executive Council signs off on an LFTEA development proposal, the zoning schemes no longer legally apply, and political pressure can be applied to increase residential densities and decrease other land use allocations, such as open space. Second, because the city's own zoning schemes no longer apply to the LFTEA development area, land is not required to be set aside for commercial use. As a result, the poor are often forced to undertake commercial activities directly from their homes, which limits opportunities for expansion, given small plot sizes, proximity to neighbours and the improbability of securing loans from banks. More importantly, the higher bulk standards associated with commercial zoning are rarely enforced in areas developed under LFTEA. These neighbourhoods are thus left without the appropriately sized and serviced plots that are a minimum requirement for providing the bulk service connections that attract businesses. With almost no mixed-use developments, LFTEA areas are bound from the outset to be residential areas, their residents compelled to travel to formal commercial amenities elsewhere in the city. This situation further perpetuates the spatial mismatch. Cumulatively, these regulations have inscribed an apartheid spatial structure on the Gauteng city-region.

Sources: Davies, R.J. (1981), "The Spatial Formation of the South African City", *Geo Journal Supplement*, 2: 59-72; Mabin, A. and D. Smit (1997), "Reconstructing South Africa's Cities? The Making of Urban Planning 1900-2000", *Planning Perspectives*, 12(2): 193-223; Maylam, P. (1995), "Explaining the Apartheid City: 20 Years of South African Historiography", *Journal of Southern African Studies*, 21(1): 19-38; Parnell, S. (1988), "Public Housing as a Device for White Residential Segregation in Johannesburg, 1934-1953", *Urban Geography*, 9: 584-602; Tomlinson, R. (1999), "Ten Years in the Making: A Metropolitan Government for Johannesburg", *Urban Forum*, 10(1): 1-40; Urban Sector Network and Development Works (2004), "Scoping Study: Urban Land Issues", prepared for the UK Department for International Development (DFID), Urban Sector Network, University of Witwatersrand, South Africa; Williams, J.J. (2000), "South Africa: Urban Transformation", *Cities*, 17(3): 167-183; OECD (2008), *Territorial Reviews: Cape Town, South Africa 2008*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264049642-en*.

These efforts are equally critical given the high costs of Gauteng's sprawling development and the high capital costs of building more schools and extending roads, water and sewer lines and storm water drainage systems. Gauteng's sprawling spatial structure has encouraged the construction of single-family residential homes and has not provided construction economies for low-cost, middle-density housing, such as two- and three-story row houses.

A lack of affordable rental housing stock prevails throughout the Gauteng city-region, especially transit-oriented development (TOD) located in high-density nodes. However, promising initiatives are resulting in increases in rental stock. The Gauteng Department of Local Government and Housing aims to increase the rate of affordable rental housing delivery by building 19 352 rental units by 2014.[10] The Department of Housing and Local Government spends 12-15% of its budget on rental housing and plans to increase this to approximately 20% in the 2012-13 and 2013-14 financial years. This is complemented by the City of Johannesburg, which has set its rental housing target at 50% by 2014. The densification strategies to be developed with the municipalities are expected to define this increase more effectively (Thring, 2011).

Reforming housing policy

To improve housing delivery in Gauteng, reforms may be needed at the national and sub-national levels. Action at both levels of government is necessary given their synergy with housing policy. For example, Gauteng can access conditional capital funds for infrastructure through national funding arrangements, which allocate housing subsidies through bulk service extensions and new household connections. In other instances, Gauteng receives funding for the requisite accompanying infrastructure through municipal infrastructure grants (MIGs). These grants may offer little funding once demands for new bulk infrastructure have been addressed, and this may curtail home construction, upgrading and densification (OECD, 2008a). Municipalities, especially under-resourced ones, may have to curtail house building if they exhaust infrastructure funds.[11] In the light of these constraints, the following section addresses housing policy at both the national and sub-national levels.

Sub-national proposals

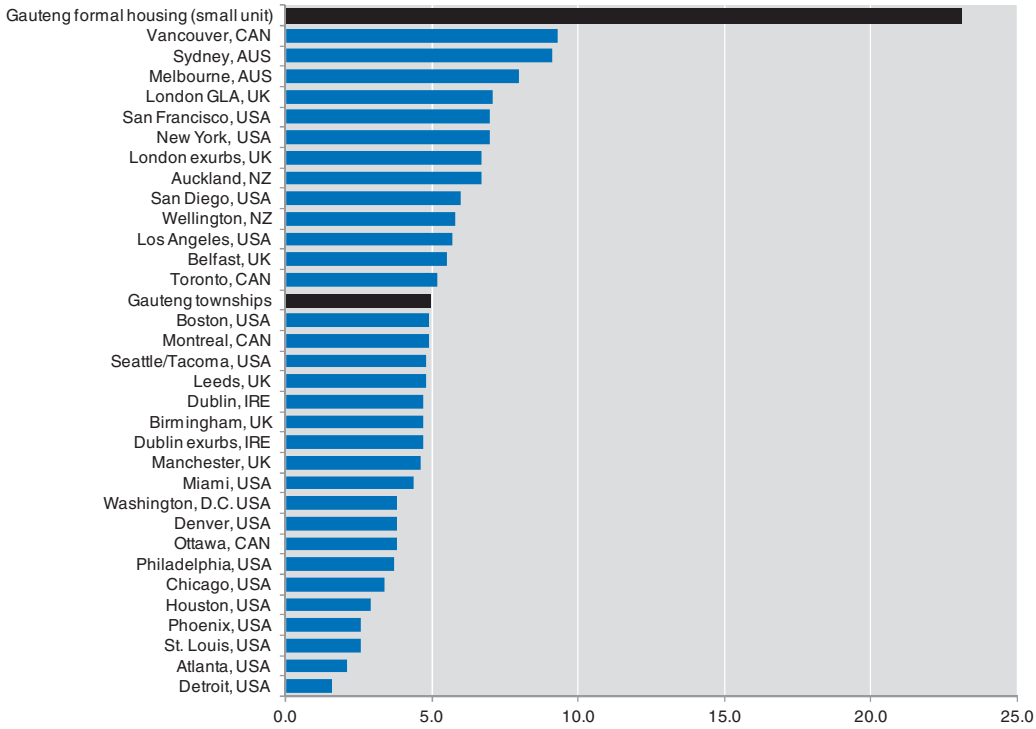
Increasing the supply of modest cost housing: a way forward

Compared to other large cities in the OECD, indicators suggest that Gauteng's homeowners pay an extremely high cost for formal housing relative to their income. The "median multiple" constitutes one standard tool to measure income affordability; it measures the ratio of median house price to the median household income in a city. The "median multiple" facilitates comparisons, though it is by no means the only affordability indicator in use.[12] Typically, those economies where individuals require over five times their annual salary to buy a home are ranked "severely unaffordable", followed by "seriously unaffordable" (4.1-5.0), "moderately unaffordable" (3.1-4.0), and "affordable" (3.0 or less) (Demographia, 2010). Using this methodology, the area could be characterised as "severely unaffordable", with high rates in Gauteng (23.1). The rate for townships in Gauteng (4.9) is characterised as "seriously unaffordable" (Figure 2.1). Nevertheless, additional caution is warranted when interpreting and drawing conclusions from this data. The "median multiple" does not take into account house and lot size differences, despite wide international variation.[13] In addition, the "median multiple" index does not integrate mortgage interest rates and transport costs, whose variability affects the cost of housing.[14] Perhaps most important, the "median multiple" does not take into account the cost of rental units, which provide housing in Gauteng. This exclusion is significant, given that 21.7% of households in Gauteng rent their home (Statistics South Africa, 2009).

Policy makers within Gauteng should be supported in their attempts to find more affordable housing solutions. A wide range of approaches have been implemented throughout Gauteng that testify to the active policy debate in this area. Ekurhuleni's Upgrading for Growth initiative, for example, includes backyard rental opportunities as a part of the planning approach to subsidised housing development. In Johannesburg, the housing strategy explicitly addresses affordability, and recently, its Planning Department developed a "Special Zones" approach to informal settlements that provides access to secure tenure and basic services with a possibility for regularisation. Such activity is mirrored at the national level, where task forces have been analysing the effectiveness of the current housing finance system (Rust, 2009). To tackle the housing problem, such programmes would need to be supported, replicated and complemented by new initiatives.

Figure 2.1. **Share of median house prices to median household income in selected cities in the OECD (Q3, 2009)**

Gauteng compared to cities in Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States



Notes: Median house prices relate to a two-bedroom, one-bathroom single-family house for Q3 2009. The following units of analysis were used: Australia: capital city statistical areas with population of over 50 000; Canada: census metropolitan areas (CMAs) with a population over 100 000; Ireland: Dublin Region (former Dublin County) and markets with a population of over 50 000; New Zealand: metropolitan areas with a population of over 100 000; United Kingdom: urban areas with a population of over 150 000; United States: metropolitan statistical areas (MSAs) with a population of over 400 000. The median income figure for Gauteng (ZAR 28 806) is derived from the 2009 *GCRO Quality of Life Survey: Median Annual Household Income* and differs only slightly from the 2007 *Community Survey* (ZAR 28 800). ABSA Bank provided the Q3 2009 figure on formal housing units in Gauteng. The Affordable Land and Housing Data Centre provided the housing data for townships, which were based on the 2008 median of the Diepkloof, Protea North, Tsakane (RDP), Katlehong Phooko and Dube neighbourhoods.

Sources: Information on Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States was compiled by Demographia (2010). Principal sources include AMP Banking (Australia); Australian Bureau of Statistics; Bank of Ireland; California Association of Realtors; Canada Mortgage and Housing Corporation; Canadian Home Builders Association; Canadian Real Estate Association; Central Statistics Office Ireland; *Chambre Immobilière de Québec*; Communities and Local Government (Ministry), United Kingdom; Department of the Environment, Heritage and Local Government (Ireland); Domain.com (Australia); Housing Industry Association (Australia); John Burns Real Estate Consulting; Land Registry of England and Wales; National Association of Home Builders (United States); National Association of Realtors (United States); National Statistics (United Kingdom); Property Council of Australia; Permanent TSB (Ireland); Real Estate Board of Winnipeg; Real Estate Institute of Australia; Real Estate Institute of New South Wales; Real Estate Institute of New Zealand; Real Estate Institute of Queensland; Real Estate Institute of Western Australia; Reserve Bank of Australia; Reserve Bank of New Zealand; Residential Property Council; Division of the Property Council of Australia; Royal Bank of Canada; Royal LePage Real Estate Services (Canada); Statistics Canada; Statistics New Zealand; United States Department of Commerce – Bureau of Economic Administration; United States Department of Commerce – Bureau of the Census; United States Department of Housing and Urban Development; University of Ulster; Urban Development Institute of Australia.

Given the fluidity of the labour market and the urban-rural interface in Gauteng, an evaluation of the affordable housing stock could provide impetus for developing a regional housing policy. Gauteng and its municipalities may opt to follow Vancouver's example and commission a discussion paper for a Regional Affordable Housing Strategy, which could inform a debate around a regional housing action plan. Vancouver used its Regional Housing Action Plan to identify sites suitable for the development of affordable housing. The strategy also included statements that requested increased engagement from the provincial Government of British Columbia in funding regional housing action plans. Critical to the framing of this project is a consideration of the direct effects of growth management and land use planning regulations on the stock of affordable housing.[15] Such an evaluation would need to take into account such factors as opportunity costs (of using the land for agriculture, the resources used to construct the house, and the cost of infrastructure, e.g. schools, police and fire, water and wastewater, and transport services) as well as the present location value and future location value of a development.

Housing departments in the Gauteng city-region could provide guidance to developers on how construction and maintenance costs could be avoided in the interests of increasing the affordable housing stock. For example, most developers converting commercial to residential buildings in inner-city neighbourhoods have not utilised "time of use" electricity tariffs, and have structured their heating systems accordingly to save residents electricity payments. In addition, municipalities could facilitate the construction of more affordable homes if they offered ready-made plans to developers that would meet city regulations. Gauteng's municipalities may benefit from emulating the approach of Austin, Texas' S.M.A.R.T. ("safe, mixed-income, accessible, reasonably-priced, transit-oriented") programme. This gives builders eight options for producing innovative housing products, including single-family urban lots and residential infill. Builders who use these options also benefit from expedited approval processing and waivers of some fees (Elliott, 2008). Currently neither developers nor the financial sector can easily access models of products that could be used for affordable housing. Guidelines from government would be useful to indicate how different kinds of development can meet inclusionary requirements in their design, with incentives offered to developers who adopt the approach suggested.

Municipalities could do additional work to incubate a larger non-profit housing development community. Government agencies in Gauteng might consider reducing the cost of development appraisals. Often these "soft costs" are an obstacle to the development of low-cost housing, because would-be homebuilders are deterred by the significant up-front costs (design fees, appraisals, environmental site studies, legal work, financing consultants), which they may not be able to recoup. Local governments in the Gauteng city-region can assume this risk by financing the costs of environmental impact assessments and other required pre-development studies by seeking repayment at zero or low interest at the end of construction. This assistance could be evaluated by municipal planning departments, in consultation with community members and housing providers.

Affordable housing programmes could better capitalise on the growing number of non-governmental affordable housing developers. The Johannesburg Housing Company, for example, manages over 3 000 units in 27 buildings. Its occupancy levels are close to 100% across the group's housing stock, indicating that such services fill a need. These efforts dovetail with other community development initiatives that combine housing with social services, economic revitalisation, lifelong learning and civic engagement (Johannesburg Housing Company, 2010). Initiatives such as these could clearly be replicated throughout the Gauteng city-region.

Stimulating the development community and creating new rental economies

Municipalities in Gauteng need to better stimulate the private sector to construct more affordable housing through proportional impact fees, waivers and housing enterprise zones. Currently, local governments maintain a pricing system under which developers are charged relatively equal amounts of fees for new or expanded infrastructure based on housing type, e.g. apartments or detached homes. Such a technique is problematic given that larger homes and more peripheral ones tend to have greater impact on infrastructure than smaller, more central homes. One solution is to adjust the impact fees to the size of the house and the development's stress on local infrastructure. Such a "proportional" system would favour developers interested in building on smaller lots in centrally located areas. For the municipalities in the Gauteng city-region, new housing enterprise zones could benefit from "a stronger future property and sales tax base, and an increased supply of all housing, including units affordable to working families and pensioners" (Nelson, 2003). A more ambitious affordable housing policy may feature both voluntary incentives such as proportional impact fees, waivers and housing enterprise zones or may include stronger mandatory approaches, such as the inclusionary housing requirements discussed below.

An encouraging amount of policy design surrounding inclusionary housing policies has taken place at the municipal, provincial and national scales, though none of the drafts have been finalised or approved. The supply of affordable housing would probably increase if municipalities in Gauteng were permitted to require developers to set aside a percentage of moderately priced units in new developments, as current policy drafts stipulate. Inclusionary housing requirements are utilised in many municipalities in OECD member countries, which typically require 10-20% of large (usually between 50- and 100-unit) developments to provide affordable housing. Developers are often given the option of paying fees in lieu of building inclusionary housing. Though this may seem contradictory, in some cases the cost of building one affordable unit on-site could be leveraged to purchase several affordable units off-site. In return for abiding by the inclusionary housing requirements, developers are typically given density bonuses.[16] In South Africa, the National Department of Housing (NDoH) formulated a set of draft guideline documents for implementation of inclusionary housing, as well as a draft policy. The draft policy seeks use two strategies: *i)* a voluntary, pro-active deal-driven component (VPADD); and *ii)* a compulsory but incentive-linked regulation-based component (Town Planning Compliant approach). The basis of the NDoH approach to inclusionary housing prescription is based on several variables, including an inclusionary percentage requirement that ranges between 10% and 30% according to the discretion of the municipality.[17] The City of Johannesburg has an interim Inclusionary Housing Policy (2009) that is under discussion. Concurrently, the Gauteng Department of Housing has formulated a draft Inclusionary Housing Policy. However, "the draft policy was never concluded and any further work discontinued in 2007 before it was submitted to the Premier's Co-ordination Forum. To date there has been no progress in the implementation of this Provincial Position" (City of Johannesburg, 2009). Faced with the frequent opposition to affordable housing developments, municipalities may adopt policies such as a "home equity assurance" programme to allay homeowners' often unsubstantiated fears that their homes may lose value in such a transition.[18]

Mainstream banks have failed to introduce adequate lending mechanisms appropriate to the lower segments of the housing market, which has reduced access to formal housing markets and constrained mobility. Banks have made few housing loans available for subsidised households, as a result of strict borrower eligibility criteria and alleged

informal "red lining" of distressed areas perceived as being high risk. Many borrowers, especially those who receive housing subsidies, are not eligible for the minimum mortgage loan because they cannot provide evidence of stable employment or earn the minimum income level required for the mortgage. Micro-lenders, in turn, have responded by offering micro-loans, which often contain high interest rates and are usually restricted to workers in formal employment or those whose employers use payroll deduction facilities. Overall, the micro-credit market is quite low given the needs of low-income residents in South Africa. The South African Reserve Banks' September 2004 *Stability Review* report revealed that micro-loans constitute only 4.5-5% of the ZAR 400 billion credit market in South Africa (cited in UN-HABITAT, 2008). Ultimately, a new range of products, such as rent-to-buy, small mortgages, instalment sale, shared-equity mortgages, matched savings and housing micro-loans need to be offered at a much greater volume.

Given these challenges, South Africa could consider introducing a rent-subsidy voucher programme to give recipients the freedom to choose the kinds of housing and the locations that best meet their needs. It would provide a rent subsidy, but would not cover the capital costs of home construction or purchasing. This tool could help Gauteng confront its high levels of neighbourhood poverty and economic segregation, while catalysing the development of a construction sector attuned to moderate-income housing. As shown by the United States Housing Voucher Programme, residents, when given the choice, move to lower-poverty, less segregated neighbourhoods. In one analysis of the spatial distribution of voucher recipients in the 50 largest metropolitan areas of the United States, it was found that voucher recipients lived in 83% of Census tracts and that only 22.2% lived in neighbourhoods with poverty rates in excess of 30% (Devine et al., 2003). Voucher programmes are not panaceas, however, and a series of complementary programmes are needed to maximise effects, e.g. assistance/counselling to help recipients identify rental opportunities, aggressive landlord outreach to expand rental options available to voucher recipients, and inter-municipal collaboration on the voucher programme (Turner, 2003).[19]

Leveraging the economic impact of housing investments

The current sectoral housing policy has been inconsistent with the emphasis on functional integration and urban density that have characterised official local and national planning debates since at least the early 1990s, most notably in South Africa's Urban Development Framework (1997). The general principles that could have reversed the spatial mismatch – compaction as opposed to sprawl, integration as opposed to fragmentation, mixed use rather than separation – are not always adhered to. The prevailing fragmented "sectoral" agenda emphasising rapid delivery and urban design concerns is often disconnected from the economic and political limitations of the city-region.[20]

A regulatory framework is needed that is able to reverse disinvestment in disadvantaged areas and to redirect financial flows to these areas. For decades, capital and financial resources have been explicitly drained from the townships and other distressed neighbourhoods. The Community Reinvestment Act (CRA) in the United States provides a relevant international practice to consider. Approved in 1977, the CRA was established for the lending performance of banks and mortgage institutions in poor and middle-income areas. The CRA proved to be a powerful instrument for channelling financial resources to disadvantaged and previously red-lined inner-city communities, and the CRA has succeeded in channelling approximately USD 400 billion to poorer neighbourhoods.

Interestingly enough, in 2002 a Community Reinvestment Act was also discussed in the South African context. This even led to the elaboration of the (still unapproved) Community Reinvestment Housing Bill, which focused on the allocation of housing finance to previously disadvantaged communities. The adoption of an instrument akin to the CRA could provide specific incentives and premiums for those financial institutions that promote financial innovations targeted at poorer communities, for example through micro-finance and rotating savings schemes, decentralised cashing systems and electronic banking in townships. Though at present all the Gauteng Provincial Government's urban renewal projects work with businesses to attract development into urban nodes such as Alexandra, Evaton, Bekkersdal and Winterveld, the private sector is not given any incentives. This could change with the adoption of policies such as the Inclusionary Housing Bill.

Consideration could be given to developing governance tools to foster the cross-subsidisation from high-income land markets to poorer markets. Tariffs could be relaxed in low-income areas or lowered for a basic level of consumption. Such a price setting would potentially allow producers to lower the price for those unable to consume at higher prices and, therefore, expand sales without losing the revenue from higher prices applied to those who are willing to pay more (Baker and McCain, 2009). However, such policies would need to be carefully calibrated to avoid higher costs that discourage investment in more developed neighbourhoods.

Given housing construction's multiplier effects on employment, authorities in Gauteng could better utilise companies in the building materials and supplying industry. In most countries, micro-finance institutions lack the capacity and the interest to expand low-income housing credit on a large scale. Homebuilders and building materials manufacturers and retailers, on the other hand, must provide home credit for the bottom of the income pyramid, the source of a substantial portion of their sales. Modern corporations provide a broader and more robust institutional platform for small home credit (Box 2.2) than do micro-finance institutions, particularly in large countries (e.g. CEMEX of Mexico). Although they recognise they must channel credit to expand their core business, building materials retailers and manufacturers frequently do not want to become lenders to poor families and communities.

In this vein, credit from larger businesses could be extended to residents to build or remodel accessory spaces and units for rent. Favourable rental housing construction economies could be created, especially in the secondary property market. As UN-HABITAT argues, "[t]he use of residential property in the townships to create wealth and or income for occupant households is extremely limited. Households are generally unable to use their property as collateral and generally are not making use of this property to generate income, either for rental purposes or for business purposes" (2008).

The large number of backyard shacks in Gauteng are a potential source of income for residents. Strategies are needed to formalise their use to ensure security of tenure, revenue collection and the provision of services. Landowners in Gauteng and throughout South Africa often lease out detached backyard shacks or interior "flatlets", and secure tenure for such rental arrangements, especially for relatives of the property owner, could be beneficial. Planners in Gauteng could adapt codes developed in OECD member countries classifying such housing as "accessory dwelling units", commonly known as in-law units, carriage houses or secondary apartments. The need both for housing and for generating income could be satisfied by making it easier for owners to construct roof-top apartments, expand existing buildings and rent additional detached rooms (Erlandsen,

Lundsgaard and Huefner, 2006). In terms of design, the units could be interior – modifying the outside of the dwelling to accommodate a separate unit – or detached from the main dwelling but still "accessory" and smaller than the main house.

Box 2.2. **CEMEX's *Patrimonio Hoy* programme in Mexico**

The *Patrimono Hoy* programme of CEMEX, the giant Mexican cement maker, serves do-it-yourself homebuilders, who account for 40% of the consumption of cement in Mexico. CEMEX research showed that low-income homebuilders in Mexico take 4 years to complete one room, and 13 years to complete a four-room house. This slow rate largely reflects the lack of support from the formal sector. Many households join informal savings clubs (*tanda*) in which each family pays USD 10 to a pool and one member is selected each week by lottery until all have received money. However, this informal savings and self-help construction can have strong drawbacks. Building materials dealers often sell to these households, at high prices, substandard materials left over from large customers. Homebuilders who lack construction skills often waste materials by buying too much or too little. They also hoard these materials, which can lead to loss from theft and deterioration by weather. Home design and construction is often of poor quality. Finally, *tanda* savings often end up being used for festivities rather than as construction materials.

The CEMEX *Patrimonio Hoy* programme addresses these problems with the business goal of expanding CEMEX sales in this market. It first organises small groups of families who commit to a 70- to 86-week saving programme. As an informal *tanda*, each group's members take turns collecting payments and playing the role of enforcer. To ensure that savings are spent on construction materials, however, families receive raw materials rather than cash. Deliveries start after only two weeks, before families have saved much, and subsequent deliveries are made every ten weeks. Thus, CEMEX is, in effect, advancing micro-credit to these families in the form of building materials. CEMEX operates this programme through establishing "cells" – four-member offices – located in low-income communities. CEMEX arranges with local building materials suppliers to deliver high-quality products and uses its cells to orient groups of households in the construction process. Rather than use advertising, CEMEX hires local "promoters" – 98% of them women – to inform local households about the programme. These women are the key to establishing the relationships and developing the trust necessary for the programme to work in the challenging environment of informal communities. The programme sponsors parties and other events to celebrate completion of a room or a house.

The average do-it-yourself homebuilder in Mexico spends USD 1 527 and takes four years to build an average-size room of 100 square feet. But participants in *Patrimonio Hoy* can build the same size room, of better quality, in less time – 1.5 years – and at two-thirds of the cost (USD 1 038, which includes the cost of materials, technical assistance from an engineer or an architect and *Patrimonio Hoy* club fees). *Patrimonio Hoy* reached 100 000 people in its first two years of operation, and planned to expand this number to 1 million by 2008. It operates without subsidy. SHF – the secondary housing-finance liquidity facility of Mexico, which is charged with leading the development of market-rate home credit – has established a window for housing micro-finance that works with *Patrimonio Hoy* and other first-tier lenders. CEMEX has operations in 23 countries, and its management is interested in expanding *Patrimonio Hoy* outside Mexico.

Sources: Prahalad, C.K. (2005), *The Fortune at the Bottom of the Pyramid*, Wharton School Publishing, Upper Saddle River, New Jersey; and Ferguson, B. (2005), "Housing Micro-finance: Is the Glass Half Empty or Half Full?", *Global Urban Development Magazine*, 4(2): 1-19.

Towards an overhaul of national housing policy

Spatial inequality in the Gauteng city-region makes continued action at the national level imperative. This section outlines the scope for a re-orientation of the human settlements policy in South Africa given the large housing deficits and the lack of attention to locating these areas in economically vibrant neighbourhoods.

Diagnosing the national housing policy impasse

This report has explained how, after apartheid, the need for speedy delivery of housing trumped the logic of space and of social integration. Because the demand for better low-income housing was so high, rapid delivery of a huge volume of social housing meant reducing up-front costs. Acquisition of land was the first step. This either meant buying cheap parcels on the urban periphery or using land acquired by the apartheid state for township development, which was also typically on the urban periphery. The South African Government correctly celebrates its achievements in this area: a fully paid-for public housing programme on this scale is virtually unprecedented in the developing world, except in a few middle-income countries such as Chile, which has a significantly higher per capita income and higher growth rates. A programme that produces such high volumes on an annual basis is equally unprecedented and noteworthy. However, housing delivery has not kept up with the pace of new demand; moreover, the location of new housing developments, formal and informal, has not resolved or even marginally mitigated the spatial mismatch hypothesis described earlier.

It is now clear that the fully subsidised house and plot on which housing policy in South Africa is now predicated is unaffordable for the state, given the scale of the housing problem. It is also unaffordable for poor households, given the reproductive costs associated with a formal dwelling that is supported by a network infrastructure system funded and maintained by the municipality. To illustrate this, it is worthwhile turning to calculations by the housing finance expert Kecia Rust. Her projections suggest that if South Africa wants to eliminate informal settlements over a ten-year period, assuming no growth in demand, the annual housing budget would have to expand dramatically to ZAR 30 billion, twice the current national budget. Given the substantial portion that the current allocation represents as a percentage of the national budget, this is simply unlikely and unviable from a macroeconomic perspective.[21]

Furthermore, the public housing programme locks municipalities into a negative fiscal position, which further undermines the prospects of generating viable municipal-level financial markets premised on the credit-worthiness of local authorities.[22] The current housing policy also drives up infrastructure investment and maintenance costs, because the delivery happens mainly on greenfield sites on the periphery of urban settlements. It entrenches a highly inefficient and environmentally unsound spatial form, making it ever more difficult to reverse.

The current public housing model is unaffordable not only for the national government, but for its intended beneficiaries. Many struggle to keep up with the reproductive costs associated with a formal dwelling (i.e. paying property tax or property upkeep). It is important to keep in mind that the policy seeks to support and empower 86% of South African households with incomes below ZAR 3 500 per month. Within this broad band, almost 40% live on less than ZAR 800 per month, and almost 70% below ZAR 1 500 per month. This indicator of poverty underscores the implications of large-scale structural unemployment. If people have irregular or insufficient income, it

makes very little sense to impose a regular and substantial social reproduction cost burden upon them. This assertion is particularly germane since these assets depreciate overnight when they are transferred to the beneficiaries. Illustrative qualitative research from Urban LandMark Trust suggests that dwellings that cost up to ZAR 100 000 to bring to fruition can be traded for less than ZAR 10 000 within a year of taking ownership. There is as yet no systematic data on this informal and clearly depressed market, because it is technically illegal to trade in subsidised housing stock (Rust, 2009).[23] For some beneficiaries, the greenfield sites entail high ongoing transport costs – and in addition, these settlements in some cases lack neighbourhood facilities such as schools, health facilities, recreational spaces, commercial activity and so on.

The new Reconstruction and Development Programme housing settlements in these greenfield developments could facilitate more liveable, dynamic communities. The current programme is driven by and large by the former national Department of Housing, recently renamed the Department of Human Settlements, and the houses often lack the range of supporting neighbourhood elements that make a settlement a neighbourhood with the potential to grow, evolve, catalyse dynamic interactions and foster a sense of place.

Policy makers are well aware of the structural problems of the public housing programme. As the 1997 Urban Development Framework of the South African Government indicated, the problems of sprawl and the lack of racial and class integration were recognised and understood. However, the political capital of a universal public housing programme for the poor was high, given the large proportion of South Africa's population living below the minimum living level. Only after the release of the analysis by the Presidency in the assessment *Towards a Ten-Year Review* (2003) was the way opened for a new policy approach and discourse, titled "Breaking New Ground" (2004). This argued that sustainable human settlements are "well-managed entities in which economic growth and social development are in balance with the carrying capacity of the natural systems on which they depend for their existence and result in sustainable development, wealth creation, poverty alleviation and equity." The "Breaking New Ground" strategy aimed to provide developments where: "the present and future inhabitants of sustainable human settlements, located both in urban and rural areas, live in a safe and a secure environment and have adequate access to economic opportunities, a mix of safe and secure housing and tenure types, reliable and affordable basic services, educational, entertainment and cultural activities and health, welfare and police services".

Despite the progressive message of the "Breaking New Ground" housing strategy (2004), effort and spending on new and integrated responses to the problem of public shelter remains marginal. Four main reasons can be advanced:

i) Politicians and officials are largely assessed on their capacity to spend the total allocations for free subsidised public housing. Provincial governments that under-spend on their housing budget are regarded as irresponsible and unresponsive to the needs of the poor. Meanwhile, the pressure to channel money through provincial governments to municipalities of widely varying capacities is so intense that little time or energy remains for more complex and protracted actions, as demanded by the "Breaking New Ground" approach.

ii) At the core of this impasse lies the problem of determining who will take the lead in driving a new approach. The national Department of Human Settlements is absorbed in a broader national government process of reorganisation and contestation, as it positions itself to absorb a number of functions located in sectoral departments.[24] Provinces like

Gauteng and the Western Cape are exploring the adjustment of their provincial policy frameworks but are constrained by nationally determined guidelines and regulations.[25] New policy actors have entered the debate, including the National Housing Agency and a dedicated informal settlement upgrading unit that reports to the agency. All of these actors contribute to policy development at the current conjuncture.

iii) A lack of legislative progress in resolving the national spatial and development planning system has stymied housing policy. Policy reform began as far back as 1996, when the first Planning Commission was established to investigate and recommend how planning could best be institutionalised. This commission concluded its work, in 2000 and a "White Paper on Spatial Planning" was prepared and eventually approved in 2001. Since then, the national government has not been able to produce a Planning Bill acceptable to Parliament and various stakeholders. This legislative uncertainty has perpetuated fragmented and outdated institutions and practices for local development and planning.

iv) The mismatch between public and private investments in the built environment is a final barrier to the formation of sustainable settlements. It is relatively well established that the private sector has not always followed the government's wishes on where urban investments should be targeted (Todes, 2006; Turok, 2001). Collaboration between municipal authorities and the private sector, especially in Soweto, is on the rise, but the constitutional protection of private property makes it difficult for city governments to institute regulations in the name of social rights or public goods that appear to affect property rights negatively. A perception of a reduction in property values can be interpreted as an infringement of that right. The middle classes in South Africa are often militant in defending their interests through ratepayers' associations and other specialist organisations and often threaten litigation to block government plans or interventions. The "not-in-my-backyard" syndrome (*Nimbyism*) can be a powerful instrument to deter ambitious planners (Swilling, 2010). Representative organisations such as ratepayers' associations in these communities are adept at using appeal provisions in environmental and heritage legislative provisions to block, or at least stall, proposed developments that could socially integrate the urban fabric.

Optimising the central government's role in housing provision and oversight

The various actors involved in the long-term development strategy of the Gauteng city-region would do well to voluntarily agree on a strategic approach to address housing policy challenges. First, municipalities could be encouraged to use housing funds in a more coherent fashion, to foster better neighbourhoods. A fundamental overhaul of the various subsidies that structure local investment is essential. As long as funding streams remain departmentally based, local integration will remain elusive. Second, scaling back the current practice of building new houses on free-standing plots on the boundaries of municipalities could to help promote the socio-economic integration of low-income residents. Indeed, the cost per unit is so high that only a limited number of households can be supported on an annual basis by the fiscus. At present, those who are assisted end up being far from economic opportunities. Ironically, by moving into new housing on the edge of the city, they are burdened with high social reproduction costs due to their distance from economic opportunities and the costs associated with maintaining a formal structure. To confront these issues, six courses of action could be considered:

i) Prioritise *in situ* informal settlement upgrading in combination with massive investment in public infrastructure in low-income communities. The Department of Local Government and Housing (DLGH) plans to upgrade informal settlements and provide proper services and land tenure to 96 760 households by 2014. One case that could be adapted to the Gauteng city-region is the approach of Medellín, Colombia. Medellín has successfully undertaken an ambitious public infrastructure investment programme that combines improved public transport with quality public spaces, parks, cycle routes, public libraries and school reform (including both curriculum reform and upgrading of facilities). All of this came before and alongside *in situ* upgrading strategies. The human settlements subsidy in South Africa could be expanded to incorporate household improvement and linked public infrastructure investments. It is critical to combine these. The National Treasury's Neighbourhood/Township Renewal Programme provides a useful reference point for the categories of public infrastructure investment that could be considered (Box 2.3). The only difference is that these investments would be made in upgraded informal settlements and not only in townships.

Box 2.3. **Neighbourhood Township Renewal Programme**

The Neighbourhood Development Programme (NDP) is located in the Budget Office of the National Treasury and is tasked with supporting economic development and quality-of-life improvements in targeted townships. Specifically, the NDP supports neighbourhood development projects that provide community infrastructure and create the platform for private sector development and which also improve the quality of life of residents in targeted areas.

The Neighbourhood/Township Renewal Programme is underwritten by the Neighbourhood Development Partnership Grant (NDPG), a conditional grant to municipalities through the Division of Revenue Act (DORA). The grant is premised on the proposition that public investment and funding can be used creatively to attract private and community investment to unlock the social and economic potential within neglected townships and neighbourhoods. One of the critical underlying principles of the fund is that the government's efforts to address social inequalities should focus on people, not places, echoing the principles of the National Spatial Development Perspective. This approach is meant to reinforce a clear policy bias that future settlement and economic development opportunities should be channelled into activity corridors and nodes that are adjacent or linked to main growth centres. As such, infrastructure investment and development spending should primarily support areas that are earmarked to become major growth nodes.

By the 2009-10 financial year, 90 awards in 57 municipalities were under management, at a value of ZAR 8.82 billion. The NDP is likely to terminate in 2017-18, according to National Treasury estimates.

Source: Republic of South Africa, National Treasury (2010), "NDPG Quick Facts", National Treasury, Pretoria, *http://ndp.treasury.gov.za/default.aspx*.

ii) Given the inability of government to build homes at a rate fast enough to satisfy the moderate-income market, housing policy needs to be redesigned to explicitly support initiatives aimed at fostering private sector participation in upgrading activities. Such strategies have already been implemented in Morocco, Brazil, Mexico and Cambodia. In Morocco's new "Cities Without Slums" (*Villes san Bidonvilles*, or VSB), for instance, private-sector developers are encouraged to participate in the social housing market through tax incentives and serviced land provided by local governments. Developers are required to service the land allocated to them by the government and to construct affordable apartments. Developers are eligible under the VSB programme if the

apartments cost less than USD 25 000. Applicants also receive a purchase subsidy of 30%, among other subsidies (Martin and Mathema, 2008). Such a case may have resonance in Gauteng, but safeguards against cronyism and preferential treatment for particular contractors would have to be provided.

iii) To implement a more effective housing strategy, concurrent mandates shared between provincial and municipal governments in South Africa over land management could be clarified. At present, no one agency or level of government controls land management, and roles are often vaguely defined. While zoning and land use planning constitute a responsibility of municipalities, land management and housing reflect concurrent mandates with the provincial government. The provincial role, in turn, is constrained by the national government, which has delayed introducing a coherent regulatory framework. A new bill, the Spatial Planning and Land Use Management Bill 2011, has been drafted to address this matter. It intends to promote co-operative governance in relation to land development and land use management, and facilitate the co-ordination and alignment of the land use scheme of different municipalities and the plans, strategies and programmes of national and provincial organs of state. The bill aims to "provide for a uniform, effective, efficient and integrated regulatory framework for spatial planning, land use and land use management in a manner that promotes the principles of co-operative government and public interest" (Department of Rural Development and Land Reform, 2011). The adoption of this legislation could help to introduce a more coherent national regulatory framework for land management.

iv) The South African Government should be acknowledged for implementing a land audit of "parastatal" land (belonging to agencies wholly or partly owned by the national government), but a strategy could be developed to release parastatal land for affordable housing. At present, parastatals are not encouraged to release land for housing even if it is idle. There is room for using centrally located parastatal-owned land in Gauteng for affordable housing, and the national government's newly created Housing Development Agency[26] could play a more significant role. As specified in the "Housing Development Agency Act No. 23 of 2008", the Housing Development Agency will "identify, acquire, hold, develop and release state and privately owned land for residential and community purposes … [and] ensure that there is centrally co-ordinated planning and budgeting of all infrastructure required for housing development".

v) The objective to set aside well-located public land for low-income housing deserves acknowledgement and support. Though this inventory is being created at the national level, additional measures are required to adopt a single and seamless state land release procedure and predetermined timeframes within which key approvals would be realised. This strategy aims to set aside at least 6 250 hectares of well-located public land for low-income and affordable housing (Presidency of South Africa, 2010). This includes the development and adoption of criteria to inform identification of suitable land and its development. The strategy also calls for the Housing Development Agency (HDA) to regularly undertake, in consultation with all spheres of government, the identification of required land and to produce at regular intervals a list of prioritised publicly owned land to be released for human settlements. This strategy is particularly needed in Gauteng, where the national government, particularly through Transnet, the South African Post Office and the Defence Force, owns large and/or strategic land parcels across the city-region. It is not clear how parastatals and government agencies will be compensated for setting aside land for low-income housing.

vi) To improve the relevancy of South Africa's municipal urban plans, the government could provide technical assistance in measuring plan implementation and compliance. To date, there has not been a serious evaluation of the extent to which these regulations have been implemented and/or followed, despite the enormous planning initiatives underway. Planners in South Africa have difficulty in knowing the extent to which the plans they have created have actually been implemented. In general, "[i]f planning intends to have any credibility as a discipline or as a profession, it should be possible, through a systematic assessment, to have a real judgment of planning effectiveness…'Good' planning or 'good' plans should be distinguishable from 'bad' planning and 'bad' plans" (Oliveira and Pinho, 2010). Evidence suggests that land use standards are unevenly enforced in rich and poor sections of urban South Africa (OECD, 2008a). To measure the implementation of plans, methods could include compliance-based approaches, such as the application of a "planning monitor" to measure the extent to which the goals and the objectives of the plan are met (Calkins, 1979). Performance-based methods could also be considered to better understand under what conditions land use and housing plans were consulted for subsequent decisions. More sophisticated analysis using geographic information systems (GIS) could also be employed to map permits and compare to regulation, as was done in the Brody et al. (2006) study on compliance with environmental protection regulations in Florida.

Improving mobility by enhanced transport and growth management

A large number of infrastructure programmes testifies to the government's realisation that the lack of a polycentric metropolitan transport system has limited inter-firm linkages, agglomeration economies and intra-regional trade. Numerous projects have been launched to bind the region together through additional bypasses, rail links and road improvements. The most notable projects include Gautrain and Johannesburg's new Bus Rapid Transit (BRT) programme. These efforts are promising in their potential to strengthen network effects between Tshwane, Johannesburg, Ekurhuleni and other areas in Gauteng. A more tightly connected system could optimise local supply chains, which often spill over multiple districts. Likewise, such a system can better confront the socio-spatial segregation described in Chapter 1.

The urban transit system faces increasing financial constraints, which aggravate the transport obstacles facing Gauteng's residents. From 1975 onwards, the central government gradually assumed a higher share of the total subsidy costs for the transport sector, in reaction to the international oil crisis and employers' resistance to shouldering their full share of transport costs. Although it is difficult to estimate the exact amount of the transport subsidies in light of the fact that some of the responsibilities for urban passenger transport were delegated to the provinces in 1997, total subsidy levels rose, though only bus and rail commuter costs are directly subsidised by the state. Paradoxically, the number of passengers using public transport in Gauteng has declined, thanks to competition from private minivans and taxis, which have taken over a large portion of the urban black commuter market.

Though the high-speed train (Gautrain), Johannesburg's new bus rapid transit (Rea Vaya), and Tshwane's Bus Rapid Transit programmes are impressive, they lack mechanisms to encourage drivers to switch to public transport. Without policy mechanisms like pricing and systematic and restrictive paid parking, none of these

programmes will attain the full reach of their objectives. The rising rates of motorisation in Gauteng show a contradictory trend to public transport.

Transport policies need to better respond to safety issues. An exhaustive study of crime is beyond the scope of this review, but police forces need to improve safety levels on buses and especially on trains, given the importance of public transport for integration and mobility. As noted in Chapter 1, the perception that public transport is unsafe at night has led many workers to use public transit during the day and cars for their evening commute. This in turn has resulted in high levels of traffic and declining disposable income for disadvantaged residents. Targeting safety in public transport corridors would no doubt improve ridership levels throughout the region. Such measures could help Gauteng more systematically prevent crime and respond to emergencies, allowing the area to repair its tarnished international reputation for unsafe conditions.

Underutilised transit-oriented development

Promising designs for Johannesburg's transit-oriented development merit the support of local government and the development community in light of their potential to raise density and land values around transport hubs. The large number of train stations and the expanding stations of the high-speed bus system are ideal for transit-oriented development. Several cities that have implemented BRT programmes, as Johannesburg has and as Tshwane plans to do, have experienced property appreciation around bus corridors. For example, after building a massive BRT system in Bogotá, which included 114 stations, the estimated asking price of properties grew by 15-20% (Rodríguez and Mojica, 2008). Another study detected a premium of 6.8% to 9.3% for every five minutes of walking time closer to a BRT station (Rodríguez and Targa, 2004). Johannesburg could catalyse a more interconnected polycentric spatial structure by supporting transit-oriented development and benefitting from land capture. Efforts under way in Johannesburg's Development Planning and Urban Management Department merit the full support of city authorities (Box 2.4).

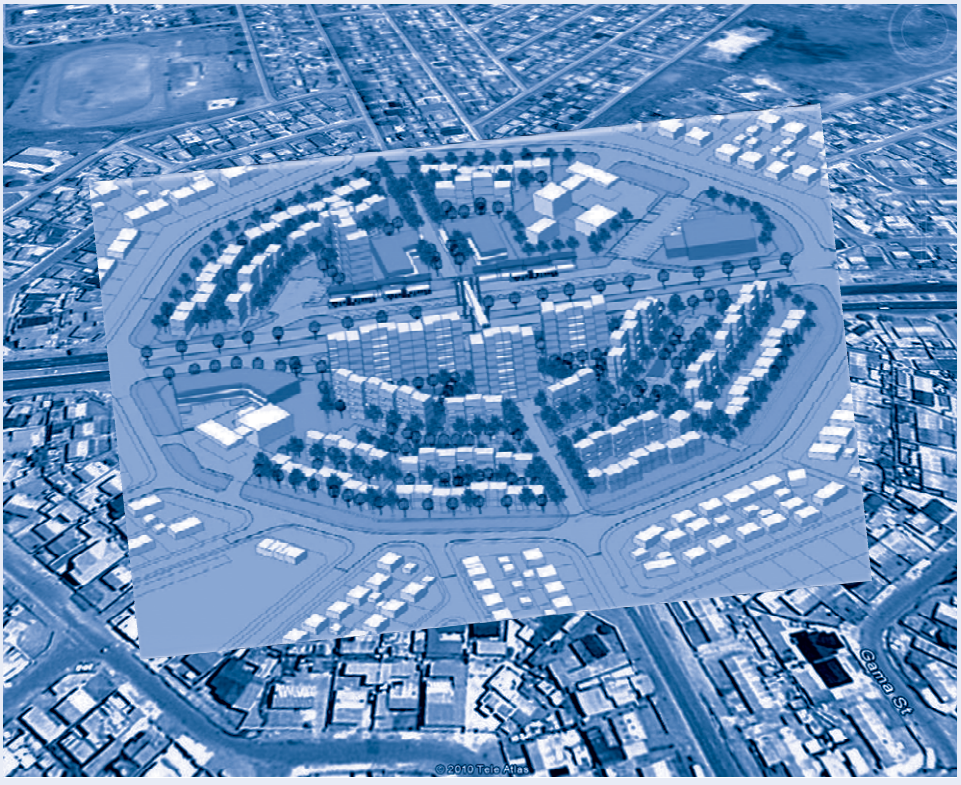
Well-designed transit-oriented developments in Gauteng have the potential of reducing motorised travel and increasing public transit. One major study predicted that transit-oriented development (TOD) would reduce single-occupant vehicle commuting by 22.5%, increase transit and non-motorised travel by 27%, and reduce congestion 18% compared with increasing highway capacity (1000 Friends of Oregon, 1997). Another study predicts that TOD reduces automobile travel by 20-25% compared with conventional development (Cambridge Systematics, 1992). Given these trends, serious evaluations of the impact of TOD are merited in Gauteng.

Box 2.4. **Transit-oriented development in Johannesburg: an untapped opportunity**

The City of Johannesburg's Development Planning and Urban Management Department is currently undertaking cost estimates of transit-oriented development, which have illustrated attractive cost-recovery features. In the Nancefield TOD project, development potential of the area of impact is estimated at 7 229 new residential units, 5 000 square metres of retail, (due to the major mall in close proximity), and 20 000 square metres of office space. Total estimated bulk infrastructure cost is ZAR 79.5 million. Funding for the infrastructure would be from the Municipal Infrastructure Grant (MIG) and City External Loan Fund at about a 70% to 30% split.

Most of the residential units will be social housing, with some medium-income units that should realise value over time. It will not make an immediate contribution to the rates base, but the office and retail component could allow for investment recovery. The office component is intended to test the market for this kind of development in Soweto. The socio-economic benefits, rather than cost recovery, are the main drivers for the proposed development.

A major selling point for this project is that the estimated infrastructure cost per unit will be approximately ZAR 13 800, compared with the average of between ZAR 45 000 to ZAR 60 000 for greenfield housing projects. If one also considers the benefits of TOD, the possible economic investment and the creation of a functional land market with differentiated land values, the development becomes a very attractive option.

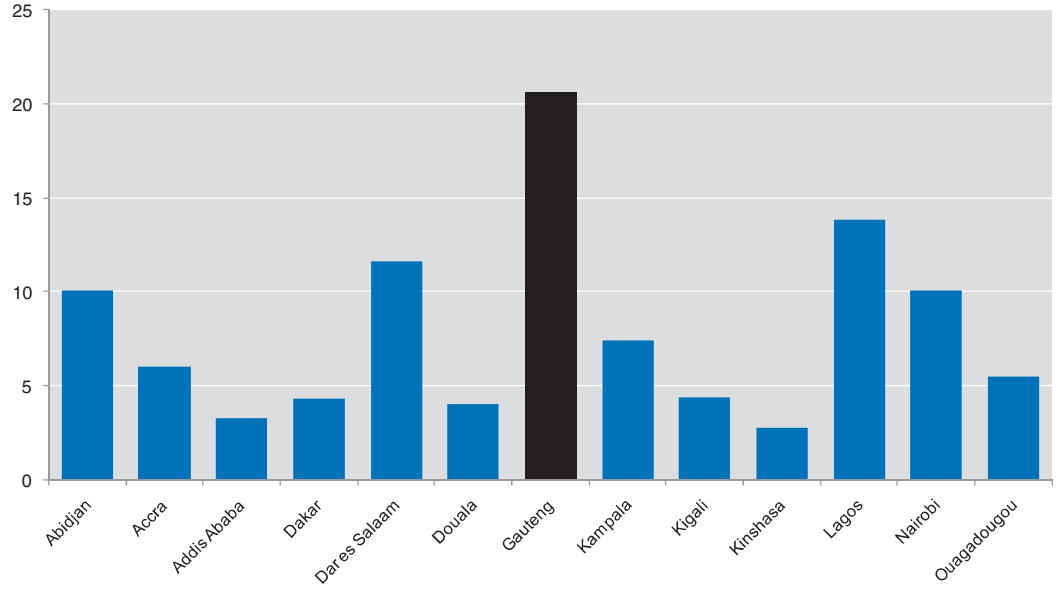


Source: City of Johannesburg, Development Planning and Urban Management.

Increasing affordability of transport

The low affordability and fractured nature of the public transport network harms Gauteng's competitiveness. Currently, typical residents of Gauteng spend 21% of their monthly income on transport, which makes Gauteng one of the most expensive cities in Africa for transport (Figure 2.2). Despite Gauteng's noted improvements, poor regional transport planning and co-ordination mean that much of the population cannot access the regional labour market, and those who do face large commuting distances and inadequate road safety. Public road transport in the form of buses is managed by provincial government but outsourced, while the taxi industry is both private and semi-formal but comes under the aegis of national transport policy.

Figure 2.2. **Proportion of household budget spent on transport in Africa**



Source: World Bank (2007), Analysis of recent household budget surveys, "Africa Infrastructure Country Diagnostic", cited in A. Kumar and F. Barrett (2008), "Stuck in Traffic: Urban Transport in Africa", World Bank, Washington, D.C., *http://siteresources.worldbank.org/EXTAFRSUBSAHTRA/Resources/Stuck-in-Traffic.pdf*; and Statistics South Africa (2008), "Figure F4 – Proportion of Total Household Expenditure on Transport by Province" in "Income and Expenditure of Households 2005/2006", Statistics South Africa, Pretoria, *www.statssa.gov.za/publications/P0100/P01002005.pdf*.

Gauteng lacks a unified fare system, which raises the cost of transport and the transaction costs in transferring from one system to another. A unified fare system could reduce commuting times and increase the efficiency of the network, given the frequency of trip chaining in Gauteng, i.e. the combination of multiple stops and modes of transport. Commuters should be able to pay only once to complete their journey. The different modes of Gauteng's transport system could be managed more effectively by treating them as inter-related parts of a single system. Likewise, all the modes would benefit from combined planning, purchasing, marketing efforts and joint use of facilities.

Multi-modal connections, especially rail/bus links and synergy with non-motorised transport, could be improved. Part of the problem could be solved by utilising designs in stations and vehicles that foster interactivity between bus, rail and bicycle use. Rail

stations, for example, could provide secure bicycle parking, and buses could accommodate bicycles more efficiently. These have become commonplace throughout OECD member countries, particularly in Copenhagen and Amsterdam. Gauteng could also improve multi-modality by integrating bus schedules with train schedules. This would minimise the passengers' waiting time and contribute to higher ridership. Finally, transport authorities could better integrate pedestrian access to transport stations by fast-tracking plans for pedestrian and cycling networks. Already, Johannesburg's Development Planning and Urban Management Division has begun integrating such reforms into several of the new bus rapid transit stations. Similar initiatives could be replicated throughout the Gauteng city-region to improve mobility. Changes such as these would also make the transport network more carbon neutral and help foster a more environmentally sustainable urban structure.

Improving growth management and densification

Low-density developments in the Gauteng city-region have hampered the use of public transport and transit accessibility. Through increasing the area of development impact, resulting in more dispersed communities, the land use pattern does not have the densities necessary to substantially increase ridership and to make public transport financially viable. The Gauteng city-region's low residential density of 157 dwellings per square kilometre compromises the viability of many forms of public transport at the scale of the city-region (Table 2.2). However, the higher levels of residential density recorded for Johannesburg Metropolitan Municipality (716 dwellings per square kilometre), Ekurhuleni Metropolitan Municipality (432), and the City of Tshwane Metropolitan Municipality (328) suggest that pockets of high-density zones within these municipalities could support viable transit.[27]

Table 2.2. **Transit-supportive residential density thresholds**

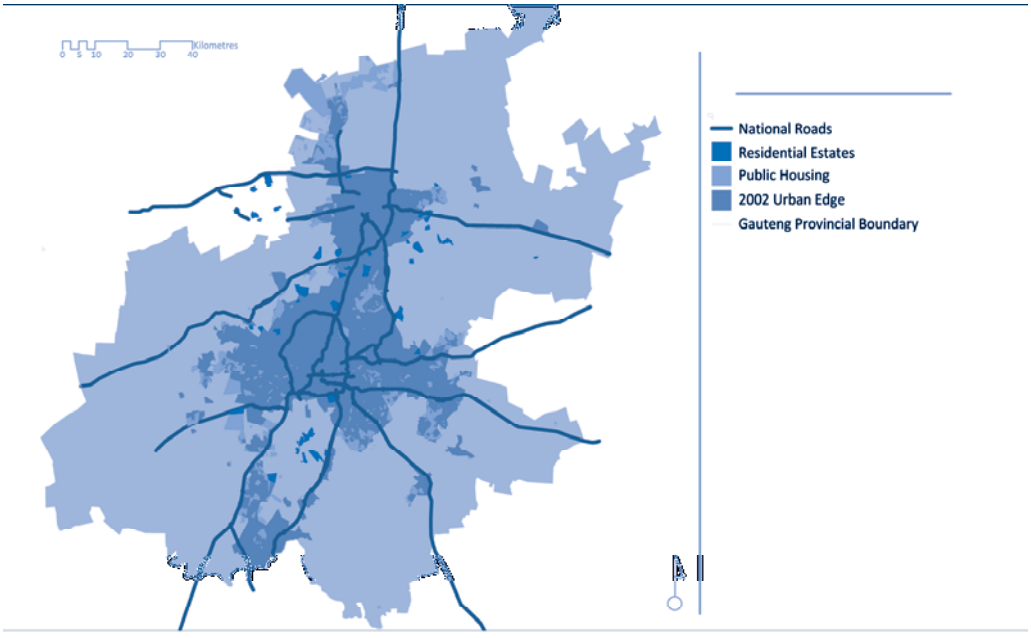
Mode	Frequency	Minimum residential density (dwelling units per km^2)
Local bus	1 bus per hour	990-1 235
Intermediate bus	1 bus every 30 minutes	1 730
Frequent level bus	1 bus every 10 minutes	3 705
Light rail	5 minute headways or better during peak hour	2 235
Rapid transit	5 minute headways or better during peak hour	2 965
Commuter rail	20 trains a day	250-495

Source: Institute of Transportation Engineers (1989), *A Toolbox for Alleviating Traffic Congestion*, Institute of Transportation Engineers, Washington, D.C.

The "Urban Edge" policy in force in Gauteng since 2002 as a tool to control urban sprawl appears not to function as effectively as intended. Development pressure has encroached on the urban edge and it is clear that several residential developments have not been contained within the boundary (Figure 2.3). As the Gauteng Provincial Government explains, "the urban edge has, until now, been abused in its intentions and has been too weakly administered" and "the urban edge has been nothing much more than temporary impedance, and successive reviews have simply had the effect of adjusting the urban edge to incorporate earlier approved developments beyond the urban edge" (Gauteng Provincial Government, 2010c). There are clearly problems of enforcement, and unauthorised development, including informal settlement, is taking place outside the boundary. In addition, many public-led development projects (such as affordable housing

projects) were treated as exceptions to urban edge restrictions and given development permits more easily than private development. For these reasons and others, the provincial urban edge was rescinded in February 2010, although local government urban edges remain in place.

Figure 2.3. **New and proposed development overlaid with the now rescinded Gauteng Urban Edge Delineation**



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: Provincial Government of Gauteng (2010), Department of Economic Development, Johannesburg, May.

Increasing density in the Gauteng city-region could be associated with improved economic productivity and direct savings in publicly borne development costs. One published study found that doubling county-level density index is associated with a 6% increase in state-level productivity (Haughwout, 2002; Muro and Puentes, 2004). Meijers and Burger (2010) found that metropolitan region labour productivity declines with population dispersion (when a higher proportion of residents live outside urban centres), and generally increases with polycentric development (with multiple business districts, cities and towns within a metropolitan region, rather than a single large central business district and central city) (Litman, 2010). In addition, incremental operations, maintenance and service costs (maintaining longer roads and utility lines, increased pumping costs, higher delivery costs for public services, etc.) would decrease with smarter, more compact growth.

To make land management more effective and to increase densification, authorities in Gauteng could consider adopting new fiscal tools. Differentiating tax rates and other fiscal tools are used in OECD member countries and may provide reference for Gauteng. Municipalities in the city-region could better share their property tax policy experience, and look internationally for guidance from other property tax regimes on how to resolve some remaining difficulties and contradictions (Box 2.5). South Africa has a variable-rate

property tax structure, and the base for taxation is the improved value, rather than just the land value, of the property. The rate applied varies according to the use of the land, and in cities like Johannesburg, vacant land is rated much higher to encourage development and densification. It may lead to challenges however, such as where vacant land is rated higher than other land uses, but where the land cannot be developed because it is beyond the urban edge or because development rights have been refused because service infrastructure is not available.

Box 2.5. **Tax and other fiscal tools for guiding dense development**

Split-rate property tax, placing proportionally higher taxes on land than on built structures, would make it more costly to hold onto vacant or underutilised, centrally located sites. The split-rate property tax stands in sharp contrast to the conventional equal-rate system, which applies the same tax rate to land and to built structures on it. Reducing the total tax burdens on land-intensive development and redevelopment could facilitate revitalisation and the replacement of obsolete buildings in older central cities. The effect is to reduce the tax burden on land-intensive uses (e.g. apartments) and increase the tax burden on land-extensive uses (e.g. parking lots) (Bengston et al., 2004). This form of tax is implemented in Sydney, Hong Kong, the US cities of Pittsburgh, Harrisburg and many other Pennsylvanian cities, and other cities within OECD member countries such as Denmark and Finland. However, because the split-rate tax also may provoke premature land conversion in outlying areas, effective regulatory mechanisms should be designed to avoid unintended consequences. A disadvantage of the tax could be the transaction costs of valuing urban land values independently from built structures.

Use-value tax assessment in peri-urban areas also provides farmer landowners with an incentive to maintain agricultural use, because land is taxed at a lower agricultural or forestry value rather than the higher values associated with development uses. This policy typically includes requirements that the owner be actively engaged in farming (Bengston et al., 2004). In the case of some Japanese metropolitan areas, including Tokyo, the designated farmlands are levied a lower property tax, assessed based on agricultural use. The designation basically lasts 30 years.

Location efficient mortgage (LEM) increases the amount of money homebuyers in urban areas are able to borrow by taking into account the money they save by living in dense, walkable neighbourhoods that are close to public transit. With traditional mortgages, there is a limit on how much money is available based on the purchaser's income. In high-density, transit-rich environments, the cost associated with transport is greatly reduced. This reduction is, for example, USD 350-USD 650 per month in Chicago, Illinois. In effect, it allows urban dwellers who depend less on automobile use to purchase a more expensive home. By obtaining a larger mortgage with a smaller down payment, LEMs would reward families who want to live in transit-oriented districts. Essentially, this could be achieved by raising the typical amount of standard loan underwriting from 28% to 39% of gross monthly income by recognising transport-related cost savings, or in more technical terms, the "location efficient" value. Application of this policy would, however, carefully weigh the advantages of densification and traffic congestion reduction with its drawbacks, namely higher mortgage default payment rates amongst LEM borrowers. The increased purchasing power is granted based on the presumption that the household is actually taking advantage of reduced car use, though the programme does not limit actual use or ownership of automobiles. As of April 2006, LEM's were available in Seattle (Washington), Chicago (Illinois), Los Angeles (California) and San Francisco (California) of the United States. These loans are resalable on the secondary market through the Federal National Mortgage Association (FNMA).

Source: OECD (2010), *Regional Development Policies in OECD Countries*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264087255-en*.

More progressive zoning techniques beyond density thresholds could also help engender a denser form. For example, the City of Kalamazoo, Michigan, in the United States, adopted a dynamic height control for areas surrounding its downtown core, in which the maximum height on an individual parcel corresponds to the height of the tallest building on an adjacent parcel plus one floor. Delhi makes maximum heights in some areas of the city a function of surrounding street widths – if streets are widened, maximum heights are allowed to increase automatically (Elliott, 2008). In existing low-density residential neighbourhoods, supporting redevelopment projects to bring medium to high-density residential apartments could also be pursued, especially in existing brownfields and areas with deteriorated building stock. In the South African context, opportunities also exist to adjust the financial contributions that developers are required to make to the infrastructure required by their developments – known locally as "development contributions" – so that new settlements beyond the current edge pay significantly more. The results of experiments under way in Cape Town and eThekwini deserve to be shared with counterparts in the Gauteng city-region, despite their practical and legal difficulties (Savage, 2009).[28]

Second, multi-story houses (apartments) should be gradually increased as a tool of densification, particularly in designated priority areas. In the Gauteng city-region, introducing multi-family houses is often opposed by residents, because they feel that densification means the loss of traditional way of living and quality of life. It is imperative for the region to prepare a vision for future living and encourage the discussion. The public sector (governments and agencies) could demonstrate new ways of housing developments in different parts of prioritised areas and promote private investment. Fiscal tools could also be used for promoting multi-story houses, for example by applying favourable property tax rates for multi-family development to single-family house development. Public housing programmes in the Gauteng city-region are beginning to favour density and offer more options than the traditional "one plot, one house" model. Double- to four-storey "walk-ups" have become acceptable, many of which are being constructed with one or two external rooms for rental as part of the main structure. The Gauteng Department of Housing and Local Government has acknowledged the need for densification and has built high-density flats in such areas as Kliptown, Middlevlei, Lufhereng and Thembisa.

Improving targeting by improved access to geoinformation and local level data

A core challenge for South Africa is to improve the quality of local level data in order to enhance understanding of local economies and the quality of public service delivery. Such indicators assist in policy decision making and monitoring public interventions. The Presidency voiced its concern that "there are particularly serious gaps with spatial analysis" in the National Spatial Development Perspective (2006), asserting:

"Amongst others, the DPLG's Intergovernmental Integrated Development Plan Hearings (2005) and the Presidency's project in support of Provincial Growth and Development Strategies (PGDSs) (2006) illustrated the widespread needs of all three spheres of government and specifically district and metropolitan municipalities for:

- a common analysis and data set;
- methods for comparable, comparative, cross-border and dynamic analysis;
- capacity to perform robust spatial analysis; and

- mutual understanding of dynamics, trends and attributes of functional regions and joint areas of impact". (Presidency of the Republic of South Africa, 2007).

Despite this concern, insufficient attention has been paid to data collection. For priority economic sectors such as tourism, creative industries, or craft, there is almost no official data on a spatially disaggregated basis that might inform the identification of competitive advantage and enhance economic planning. Noting the poor socio-economic data for LED planning, the Development Bank of Southern Africa (2008) observes that "most localities have yet to adequately map their competitive and comparative advantage, whilst the data analysis underlying the National Spatial Development Perspective (NSDP) still needs localisation and concretisation".

Given that the weakness of local data threatens the credibility of economic development strategies, all levels of government share a responsibility to regularly gather additional data and to harmonise data collection methods. This information needs to be reliable, recent and regularly updated in order to be used for policy planning, monitoring and evaluation both at national and at local level. Additional information on enterprises and business demographics is essential to analyse competitiveness. In addition, while information on population and households is already produced (for example through the *Labour Force Survey* and the *General Household Survey*), the sample should be increased to obtain information at smaller geographical scales.

An explicit commitment to develop and disseminate spatial data could confront the very limited production of geoinformation in South Africa and the lack of urban modelling. Geoinformation is usually produced at local level, and a central repository for such information is needed. This information would not only help local government, but could also be used to inform future National Spatial Development Perspectives and other spatial analyses conducted by the national government. If commonly accessible spatial databases exist, the time and cost needed for urban modelling can be significantly decreased. This can allow urban models to be used by wider ranges of users and organisations, including data-poor local governments. The existence of commonly available data issue raises the need for a National Spatial Data Infrastructure (NSDI). The notion of National Spatial Data Infrastructure was first introduced by the Executive Order 12 906 in the United States in 1994 (Box 2.6). It contained a set of measures to promote efficient sharing of geographic information throughout all public and private sector users. The notion quickly spread across many nations in the world, but each country has developed varied components and strategies relevant to its own circumstances. Korea, for example, has nationally promoted the development of National Spatial Data Infrastructure since 1995.

In light of the financial constraints of data collection and production, a decentralised statistics system could be considered in South Africa. The recent organisational changes in Statistics South Africa towards a National Statistical System, which encompasses the Central Statistical Office, the Provincial Statistical Offices and the government departments producing administrative and/or sectoral data is a step forward in this direction. Many OECD member countries have opted for a National Statistical System whose Statistical Office also provides guidelines, standards and help in capacity building of other offices but is less burdened by data collection. In the United Kingdom, for example, the Office for National Statistics (ONS) developed neighbourhood statistics, which are now collected by local authorities, including school councils and police. Information that is produced locally is then centralised and disseminated through the ONS.[29] Nevertheless, the funding arrangements of such a decentralised system in

South Africa would need to be clarified, as local and provincial governments also face financial constraints on data collection.

Box 2.6. **Co-ordinating geographic data acquisition and access Executive Order**

Executive Order 12 906 was signed by US President Bill Clinton on 11 April 1994 and coined the term National Spatial Data Infrastructure (NSDI). NSDI was defined as "the technology, policies, standards and human resources necessary to acquire, process, store, distribute and improve utilisation of geospatial data." Executive Order 12 906 also specified executive branch leadership to build NSDI. Federal Geographic Data Committee (FGDC) was designated to co-ordinate the federal government's effort of developing NSDI. Executive Order 12 906 requested federal governments to build basic components of NSDI: National Geospatial Data Clearinghouse, Data standards, National Digital Geospatial Data Framework, and Partnerships for data acquisition. It was later amended by Executive Order 13 286 in 2003.

Source: Federal Geographic Data Committee (n.d.), "Executive Order", *www.fgdc.gov/nsdi/policyandplanning/executive_order*.

2.3. Confronting economic inequality

As mentioned in Chapter 1, despite economic growth, unemployment in Gauteng (25.7%) is the most salient problem of the post-apartheid period. In 1998, following a recommendation of the Presidential Labour Market Commission, a "Jobs Summit" was convened. This set a target of radically curbing unemployment. In Gauteng, the original target meant reducing unemployment from 28% in 2004 to 14% by 2014. Ignoring the possibility of offsetting in-migration, that meant generating 800 000 jobs within the decade. This was ambitious, but the rate of job creation in the first part of the first decade of the century seemed to point to probable success, in terms of those official statistics. However, the financial shock of 2008 altered everything.

The persistence of high unemployment in South Africa is partly explained by the legacy of apartheid (e.g. a failure to produce sufficient skills among the majority African population), some exogenous factors (e.g. restructuring manufacturing and mining sectors) as well as factors linked with some structural problems in policies and institutions. The labour market is highly polarised, excluding people with medium and low education and most importantly, a large part of the African population (mostly semi- to unskilled). The regional economy has increased the ratio between capital and labour, absorbing mainly highly skilled workers. After a wave of xenophobic attacks against foreigners in the May 2008 riots, immigrants are still waiting for integration programmes.

Improving education and apprenticeship programmes

Improving the quality and availability of training is a priority and demands a focus on reforming education and training systems so that they provide the skills needed to provide more decent work in the formal economy. This is currently supported by the revised South African National Qualification Framework (NQF) (2007). Policy responses need to focus on increasing the access of the poor to training, upgrading apprenticeship training, and improving the relevance of training in public institutions. For example, the list of NQF qualifications must be up to date and reflect the demand for skills in the labour market. This could involve strengthening co-ordination and partnerships with the private

sector by integrating real, on-the-job training opportunities (i.e. formal apprenticeships). Professionals could be encouraged to teach and existing teachers given sector-based professional training, and companies could be involved in the design of curricula and the school boards. In education policy, the mixed public-private state system, in which individual schools can charge fees and hire additional or better teachers, has perpetuated huge disparities between different regions and ethnic groups. Investing in solid and transparent fee exemption policies would be beneficial along with efforts to gradually remove fees in the existing compulsory education system. This would help to even out teacher-pupil ratios, improve the quality of teaching within the public system and reduce the number of unskilled school-leavers (OECD, 2008b).[30] Finally, public further education and training (FET) programmes could play a pioneering role in providing lifelong learning as South Africa's labour force ages.

In Gauteng, efforts are needed to improve the quality of teachers in the primary education sector, which obviously contributes to poor performance by pupils. There could be a province-level campaign orchestrated by the Gauteng Provincial Government to attract and retain teachers, perhaps by offering wage premiums and loyalty bonuses, and by creating incentives for professional development and assessment. There is no obvious reason to stop this campaign at the borders of the province, or even the borders of South Africa. One of the consequences of the global recession is that in many countries, young qualified teachers cannot obtain jobs and older teachers are losing theirs. Gauteng could draw on this international pool of talent. But it is crucial to remember that retaining skilled teachers is as important as attracting them, just as it is vital to produce policies for retention in other areas of so-called labour shortage.

The lack of an effective accountability model means that there is no mechanism to ensure quality provision at district and school level in Gauteng. This is felt particularly in matters of resource allocation and financial management; for example, provincial authorities are not obliged to observe national priority areas, nor does the national level have financial audit authority over provinces.[31] Effective, "constructive oversight" could support higher levels of efficiency and at the same time respect the concurrent powers of education between the national and provincial levels.[32] One such model could be the revitalisation of a professional form of inspectorate to ensure that every learner across the country receives a high-quality education (OECD, 2008b).

Environmental constraints on skill development – inadequate living conditions, poor nutrition, poor health status, inadequate access to primary health care, poor transport, and social and economic insecurity – need to be recognised in education programmes. It is universally accepted that one of the worst legacies of apartheid was a chronically "uneducated" population, the deliberate outcome of decades of *Bantu* schooling, whose effects persist today. Despite the considerable expenditure lavished on education, and the plethora of prominent initiatives from government at the highest levels, there is widespread disquiet over the slow progress achieved. In this context, Gauteng could learn from experience of Brazil's *Bolsa familia*, which has resulted not only in better school attendance (on which it is conditioned) but in a significant reduction in poverty and inequality. Introduced in 2004, *Bolsa familia* rationalised several previous grant programmes in one benefit, paid to poor families with children on condition that school-age children attended school regularly. By the end of 2009, 12.5 million families – about 40 million people – were receiving the benefit. South Africa has a similar rapidly expanding system of child support grants, but the benefits of the programme are not conditional on any required action on the part of the beneficiaries.

Public training schemes are part of the priorities of the South African Government to address education and skills within the AsgiSA's objectives and are being applied by provincial governments, which have the responsibility for the implementation of education policies. These include training initiatives like the Joint Initiative for Priority Skills Acquisition (JIPSA) and the National Skills Fund – the NSF, which funds the SETAs (Sectoral Training and Education Authorities). The SETAs are the national agencies in charge of training and apprenticeships in sectors such as agriculture, banking, business services, etc. These initiatives are, however, relatively small-scale or beset with implementation problems (OECD, 2008b). The role of the further education and training sector (FET), i.e. vocational education institutions, could be improved as well. Given the low quality of basic education (literacy and numeracy), pupils' performances in vocational schools are poor. This has been recognised in South Africa, which in 2006 started rehabilitating and expanding its "Further Education and Training" colleges under the national objective of reaching 1 million students by the school year 2014-15, compared to the 2006 level of 276 000 (OECD, 2008b).

Training public sector workers merits particular attention, given skill shortages and retention issues. These issues are particularly sensitive in Gauteng, and have impeded its development and the delivery of an integrated set of social services. The Public Services Commission (PSC) has alerted government to the number of administrative vacancies in many parts of the administration. In 2005, the Department of Trade and Industry reported that 34% of its posts were vacant and that the problem was greater for senior posts. This crisis has continued. At provincial and municipal level, vacancies and skills shortages have repeatedly been cited as major causes of poor delivery of social services. The Gauteng Provincial Government and the national government, more generally, should examine the public sector remuneration system so as to give civil servants greater incentives for acquiring skills and to remain in jobs once they have acquired them. The remuneration system is in need of reform: although workers may move up in terms of technical capacity and status, the wage they receive in public service compares increasingly unfavourably with what people with similar profiles in skills and experience earn in the private sector (Woolard, 2002).

In spite of the rhetoric about skills development, most of the institutional initiatives by government at all levels have been small in terms of the number of persons covered. This is particularly true of the SETAs. At the provincial level, the lofty objective of being an agent of transformation has to be set against the financial scale of the commitment. The Gauteng Provincial Government has announced plans to train 500 000 people by 2014 in partnership with the SETAs and higher education and technical colleges. Yet in 2009, the authorities, through the Gauteng City Region Academy, gave financial support to fewer than 1 000 students, in most cases to attend a university course and in a minority of cases (just over 100 in 2009) to study through further education and training (FET) courses, mostly in engineering and finance.

Though enterprise-based training (formal apprenticeship) is regulated by law and based on a formal contract, it is practised by only a small number of enterprises. South Africa's formal apprenticeship laws regulate official registration of contracts; access to apprenticeship such as educational or age requirements, training duration, and skills assessment and certification procedures. Formal apprenticeships have provided training to only a small number of young people, mostly in medium and large enterprises. As in many countries, this low number of trainees is due, among other things, to the limited ability of companies or their lack of incentives to offer apprenticeship training, the limited size of the public training systems, strict entry requirements for students, who

must acquire at least Grade 8 of general schooling, and low demand by youth, as labour market absorption rates and employability are usually low (OECD, 2008b).

To meet the 2011-16 National Skills Development Strategy's goal of encouraging better use of workplace-based skills development, South Africa could expand its apprenticeship programmes and ensure higher retention of its students. Such efforts would help close the gap between the skills learned in the vocational institutes' classrooms and those demanded by the labour force. Apprenticeships are widespread in Germanophone countries, such as Austria, Germany,[33] Luxembourg and Switzerland, and also exist in Flanders (Belgium), Denmark, the Netherlands and Norway. In a number of countries, apprenticeships are provided outside the school system at post-secondary level – for example in Australia, Ireland and the United States. Dropout is a major challenge for virtually all countries, and vocational programmes typically face higher dropout rates than general education. To guard against this, South Africa could consider adopting policies to retain students in education and training, and give second-chance opportunities for those who drop out (Box 2.7).

At the same time, co-operation with private sector-led apprenticeships could also be expanded. There are several private-public initiatives within Gauteng that may merit replication. Neotel, the new telecommunications network operator based in Midrand (central Gauteng Province), has launched the Neotel Academy. Leading industry firms provide proprietary curriculum, training materials and even trainers to the Academy, which is accredited to the sector's SETAs. There is also the Ifihlile Training Academy, formed in 2005. However, both are very small and still in a pilot testing phase, covering fewer than 100 students in each case. In terms of improving the connectivity of universities to the labour market, the Community and Individual Development Association (CIDA) City Campus' programmes could be adapted elsewhere in Gauteng. The university supports disadvantaged young people from South Africa and other sub-Saharan African countries who are trained to become leading managers. Many local companies offer internships to complement theoretical knowledge gained in the classroom. The concept of the university appears to be a good example of how to provide high-quality education to underprivileged students, while at the same time involving the private sector, including companies.[34] At the national level, in 2007-08, 200 000 people were on subsidised "learnerships", but there were estimated to be about 1 million employers. It is not clear why take-up has been so low, but one option for Gauteng would be to insist that each employer in the province has at least one learnership.

Box 2.7. **Retention measures and second-chance opportunities**

Retention measures

In Austria, students who do not find an apprenticeship place may participate in so-called *überbetriebliche Ausbildung* (ÜBA) courses, which are legally equivalent to apprenticeships. Students are either in full-time off-the-job training in ÜBA centres with a view to obtaining their apprenticeship certificate, or participate in training in simulated companies and receive support from ÜBA centres to find a regular apprenticeship place.

In Flanders (Belgium), part-time vocational education combines one to two days a week at school and three to four days of other activities. The latter may consist of employment, volunteering, specific programmes to develop employability skills and individual guidance for vulnerable students.

In Germany, the newly launched Education Chain Initiative aims to assist students who find difficulties in transiting from school to the vocational education and training system. The objective is to replace isolated transition measures with structured support for students at risk. Following a national screening procedure in Grade 7, two strategies are envisaged: inside schools to support students in acquiring core basic skills and outside schools, where a coach supports young people in their transition to vocational programmes – particularly apprenticeships.

Second-chance opportunities

In Ireland, Youthreach offers a programme including general education, vocational training and work experience to unemployed early school leavers aged 15-20. Those over 21 years can benefit from the Vocational Training Opportunities Scheme to acquire general or vocational certificates, or attend part-time education through the Back to Education Initiative.

In the United States, young people over 16 who left high school without earning a high school diploma may take General Educational Development (GED) tests to acquire a credential (diploma or certificate, varying by state). GED tests measure skills and knowledge in mathematics, reading, writing, science and social studies. GED credentials are generally accepted as equivalent to high school diplomas.

Sources: Hoeckel, K. (2010), *Learning for Jobs: OECD Reviews of Vocational Education and Training: Austria*, OECD Publishing, Paris, *www.oecd.org/dataoecd/29/33/45407970.pdf*; Flemish Ministry of Education and Training (n.d.), *www.ond.vlaanderen.be/onderwijsaanbod/dbso*, accessed June 2010; Hoeckel, K., and R. Schwartz (2010), *Learning for Jobs: OECD Reviews of Vocational Education and Training: Germany*, OECD Publishing, Paris, *www.oecd.org/dataoecd/9/6/45668296.pdf*; Irish Department of Education and Science and the Department of Enterprise, Trade and Employment (n.d.), Youthreach website, *www.youthreach.ie*; Vocational Training Opportunities Scheme (n.d.), *www.vtos.ie*; Irish Department of Education and Skills (n.d.), *www.educationireland.ie,* American Council on Education (2010), GED Testing Service website, *www.acenet.edu/AM/Template.cfm?Section=GED_TS*, accessed June 2010.

Raising employment through improved labour market policies

Calibrate wage subsidy programmes and consider alternatives

A careful design of wage subsidies is critical in South Africa, given how many such programmes suffer from drawbacks and lack evidence of benefiting lower-income groups. Caution with wage subsidies is warranted given evidence that suggests that such

schemes create very few additional jobs (Betcherman and Islam, 2001).[35] The policy of labour subsidy has come up repeatedly since 1994, and the newest incarnation is the Layoff Training Scheme launched in 2009, which received ZAR 2.4 billion in the government's 2010 budget. Line responsibility within government for implementing the Layoff Training Scheme has been given to the Commission for Conciliation, Mediation and Arbitration (CCMA) and through it the Department of Labour. The objective is to prevent retrenchments during the recent downturn. The outcomes most likely have a high deadweight effect, i.e. much of the money may go to firms that would have employed such people in any case. However, the problem of deadweight losses that has beset wage subsidy schemes in other countries may be of less importance in South Africa, since so few of the unemployed now succeed in finding jobs. Wage subsidy schemes in South Africa may also be beset with a substitution effect, i.e. it would lead to some displacement of other workers by the group provided with a subsidy, in this case young workers displacing somewhat older workers. The substitution effect can be better addressed by having the wage subsidy tied to training, as with the existing learnerships. Finally, measures are needed to curb the cost of administration of these programmes and to discourage inefficiency. The experience with the learnership programme, for example, illustrates that the administrative requirements around the learning component of the programme are excessive (OECD, 2010e).

Improving labour market intermediation

Besides the development of skills, much more attention needs to be spent on active labour market policies. In general, policies in Gauteng have prioritised improving and streamlining policies for the development of skills. In the context of the enormous challenges that are faced in townships, this is a necessary but not a sufficient condition for social and economic inclusion of poorer communities. More ambitious programmes aimed at active labour market policies need to be implemented. An interesting example can be taken from Mexico, which, since the 1980s, has developed a relatively extensive track record of active labour market policies with a focus on the alleviation of poverty. Most of these programmes were set up as complementary and compensating instruments in order to soften macroeconomic shocks, both associated with the restructuring of the Mexican economy after the end of import substitution and the promulgation of deregulation, privatisation and liberalisation. The early programmes were characterised by employment intermediation, training for the unemployed, improvement of the productivity in small, micro and medium enterprises (SMMEs) and modernisation of work practices (e.g. through the reduction of costs associated with the negotiation of labour conflicts.)

The evaluation procedures in place are not adequate to assess the efficiency and equity of the Gauteng Provincial Government's support of small-scale businesses, particularly the Gauteng Enterprise Propeller Act.[36] There is ample evidence that, in South Africa, working conditions, skill formation and wages and benefits are often, if not usually, much worse in small-scale enterprises. Singling them out for extra money and assistance, without carefully monitored conditionalities, is not necessarily good policy, and caution is called for. This is not to say that small-scale businesses should not be facilitated and encouraged. These potentially costly and potentially productive initiatives merit proper evaluations by third parties as they evolve.

Sub-national authorities in Gauteng can play a more pro-active role in delivering active labour market policies. Experience in OECD member countries has shown that

economic growth and job creation can be improved if local agencies and authorities have more power and autonomy to adjust employment and training programmes to meet local needs (OECD, 2003). In emerging economies like Brazil, a series of interesting experiments have been conducted, including with such projects as incubators for co-operatives, the creation of specific niche programmes for entrepreneurial development in vulnerable communities, with support from larger enterprises, and decentralised labour market intermediation, with active participation of the local stakeholders (enterprises, labour and local governments) (Box 2.8). Many of these programmes were then complemented with the provision of real and financial services – credit, capacity-building, etc. In some cases, this also led to creative experimentation, and learning by doing, in traditionally difficult sectors; for example, through the involvement of co-operatives in the collection, improvement, recycling and commercialisation of urban solid waste.

Box 2.8. **Local labour market policies in Brazilian cities**

In a very large and disparate country such as Brazil, which is characterised by a relatively decentralised institutional setting, national and state agendas need to be complemented with a specific set of priorities at city level. This is all the more urgent in light of the ongoing Brazilian process of decentralisation of the active labour market and intermediation policies at the state and local level. As a consequence, since 2006, cities have had to take over the responsibility for the so-called labour intermediation centres, which were previously managed at the national level with heavy intervention from the labour union. Thanks to the decentralisation process, cities now have a concrete perspective from which to broaden the policy agenda. A rather narrow focus on formal sector wage-based employment within larger firms that prevailed previously has shifted towards new forms of self-employed and entrepreneurial forms of income generation. In Belo Horizonte in the state of Minas Gerais, for example, several welfare-based service centres that provide unemployment benefits and services are being transformed into alternative vehicles for employment and income generation at the local level, often in direct partnerships with larger enterprises. In exchange, these larger firms receive official recognition and positive marketing in the media, which also leverages the business' policy on corporate social responsibility. In other cities in the metropolitan region of São Paulo, the projects being developed are more directly focused on involving the new local labour intermediation centres in local anti-poverty and income-generation strategies, such as upgrading, micro-credit, capacity building, collective marketing efforts, etc.

Moreover, some cities are directly exploring strategies intended to leverage self-employment in the construction sector, in light of the recently improved so-called National Accelerated Growth plan. This plan has set specific targets for the housing and urban development sector, and in particular, investments in upgrading slums. As a result, some cities have set up dialogues with local stakeholders (including community associations, NGOs and representatives of business associations and the labour movement) around decent work strategies in the construction sector. The work in progress is expected to be documented in a handbook (or manual), which could serve as reference material for other cities in Brazil and Latin America.

Source: International Labour Organization (ILO) (2008), *Manual on Local Decent Work*, ILO, Geneva.

Efforts in Gauteng to achieve better "job matching" merit support. For example, the City of Johannesburg has introduced a Job Pathways programme, whose beneficiaries will be drawn from a list of indigent families granted rates and service charge subsidies under the city's Expanded Social Package. The Gauteng Provincial Department of Economic Development and the Human Sciences Research Council (HSRC) are testing an initiative to promote innovation in matching and placement services aimed at

unemployed matriculants. The aim is to activate networks of services to link youth to post-school job opportunities in the private and public sectors, including non-profit organisations that can in turn access the Expanded Public Works Programme (EPWP) employment incentive. The Department of Higher Education also plans to expand relevant further education and training. Gauteng's support is intended to incentivise matching services, with the aim of co-ordinating funding from other sources such as the EPWP II, the public bursary programmes and the National Skills Fund. These initiatives indicate a strong commitment to improving the efficiency of the labour market in Gauteng, but should nevertheless be subject to objective evaluations.

Improving the coverage of social protection policies and their monitoring and evaluation

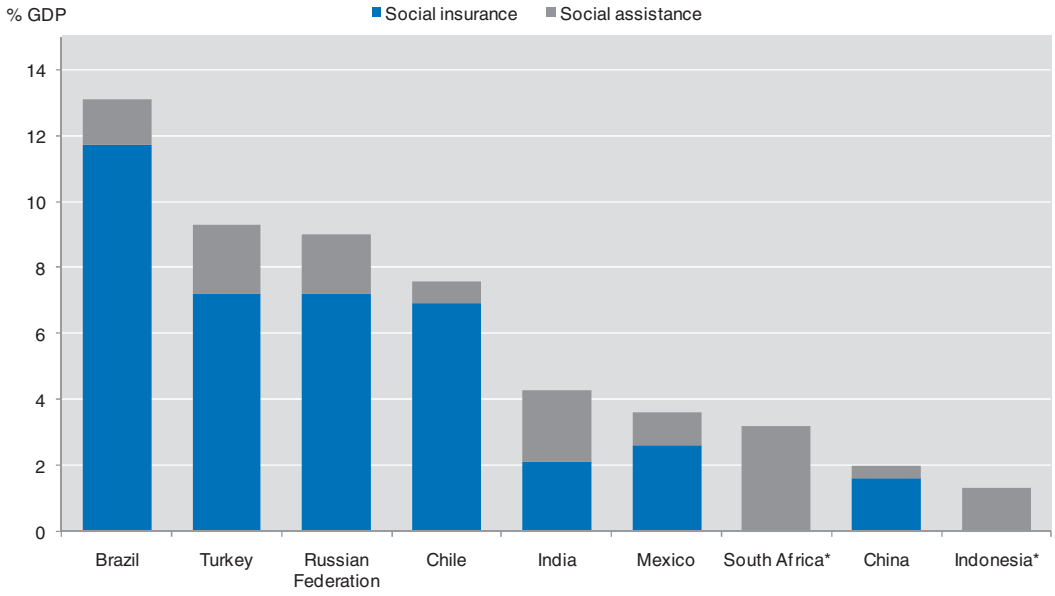
There are two basic challenges in creating a governance system to decrease economic inequality in the Gauteng city-region: *i)* improving the coverage of social protection policies; and *ii)* enhancing the oversight capacity of these programmes by requiring transparent monitoring and evaluation. These reforms are important because they build on the major policy successes of the first era of democracy, the development and refinement of child benefits, which have tended to reduce income poverty (van der Berg, 2005; see also Leibbrandt et al., 2008). There is evidence that child support grants in South Africa have helped increase women's participation in the labour force (Posel et al., 2004) and that the old-age pension, the child support grant and the disability grant all helped raise labour force participation and employment (Samson et al., 2004). This has been found to be the case despite the relatively low level of child support grants.[37]

Recognising the piecemeal patchwork of social services and social transfers, several attempts at comprehensive reform of social protection have been initiated, but they have not been accompanied by major reforms. The major initiative was the Committee of Inquiry into a Comprehensive System of Social Security for South Africa (2002), set up by the Department of Social Development.[38] Although there have been various improvements, in particular the introduction of child benefits, an effective and equitable system of social protection for "prime-age" adults between the ages of about 16 and 60 is not yet in place. The vast majority of South African "workers" have no social grants to draw on, and South Africa spends less than its peers in public social expenditure (Figure 2.4).[39]

In addition to the social security grants, which are vital to the income of poor households where unemployment is the norm, the national government requires that each municipality have a register of indigents.[40] This is to administer the following subsidies:

- free basic water: 6 kilolitres (6 000 litres) per month per household;
- free electricity: 50 kilowatt/hours per month per household for a grid energy system;
- free sanitation: 100% of rate/charge if household income is below a certain level;
- transport subsidies are made available for people who use bus and rail public transport.[41]

Figure 2.4. **Public social expenditure (excluding health)**



* Data on social insurance is not available for South Africa and Indonesia.

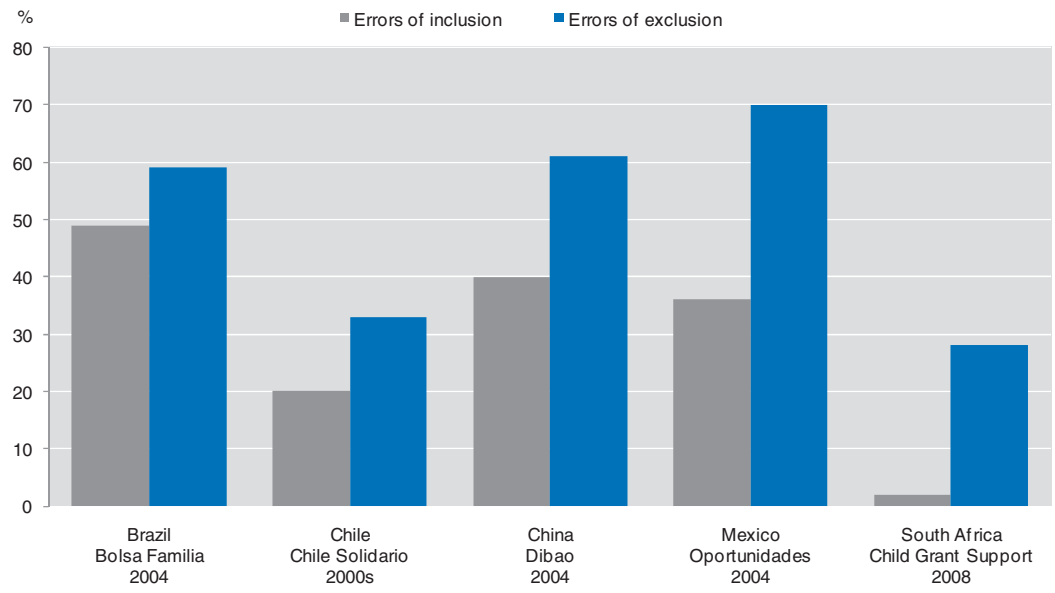
Source: Weigand and Grosh (2008), adapted in OECD (2010), *OECD Employment Outlook 2010: Moving Beyond the Jobs Crisis*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/888932292802*.

Within the broad parameters of national policy, municipalities are free to adopt their own approach. A number of Gauteng municipalities have adopted innovative options, with subsidies well above the expected rates. In Johannesburg, for example, six kilolitres of subsidised water are provided as a universal service to every account holder in the city, with extra kilolitres for those registered successfully as "indigent" and with the amount depending on criteria to establish the degree of poverty and need. Some households may now receive up to 15 kilolitres under the system, in addition to greater volumes of free electricity. A spatial targeting aspect is also now being introduced, and in the future more deprived areas will receive more subsidised water than less deprived areas. There have been attempts to target households not attached to an account. A danger of averaging over areas is that it is regressive and unfair on those with large households, who tend to be among the poorer sections.

Despite the engagement of municipalities in social protection, few effective monitoring and evaluation processes exist to assess the quality of service provision. In 2007, the City of Johannesburg switched to an individual account system, a new development for cities, creating a "one-stop shop" with a card labelled: "We help you to help yourself." The Johannesburg municipal authority has developed its own poverty line, using a "score-based" approach that requires a South African ID number and account details. It has also introduced a spatial element through geographical targeting based on "data zones". However, all this depends crucially on having relevant up-to-date information, if it is to have any prospect of being efficient and equitable. Unfortunately, "data age" is a major problem in South Africa, as it is in most countries. Often provincial and municipal officials are allocating targeted and selective services on the basis of data that are several years old. An evaluation of the administrative cost of this targeting approach to service provision is justified.

There are potential costs associated with close targeting in South Africa, both at the national and municipal levels. First, it is expensive for the public institutions in charge to gather the information required for the means test (or proxy means test). Second, applying to the programme is also costly for the applicants in terms of time, cash cost to gather the information, travelling to the registration site, etc. Third, social costs may arise if participation in the programme carries some sort of stigma. Lastly, South Africa's programmes often have a high error of exclusion, i.e. a percentage of households that are eligible in principle but that are not covered by the programme. Errors of exclusion are larger in Mexico, excluding up to 70% of eligible households, and those in South Africa's Child Grant Support programme (2008) exclude approximately 28% (Figure 2.5). Obviously, one important cause for errors of exclusion, or under-coverage, is the limited size of the budget that governments allocate to the programme. In fact, a trade-off exists between extending coverage (reducing exclusion errors) and improving efficiency in targeting (reducing inclusion errors) (OECD, 2010d).

Figure 2.5. **Errors of exclusion (under-coverage) of cash transfer programmes**



Source: Soares et al. (2007), "Evaluating the Impact of Brazil's Bolsa Família: Cash Transfer Programmes in Comparative Perspective", *IPC Evaluation Note*, No. 1, International Poverty Centre, Brazil, December, for Brazil and Mexico; Contreras, D., O. Larrañaga and J. Ruiz-Tagle (2008), *Evaluación de Chile Solidario*, Borador, UNDP, for Chile; Wang, M. (2007), "Emerging Urban Poverty and Effects of the Dibao Program on Alleviating Poverty in China", *China and World Economy*, 15(1), for China; based on Leibbrandt, M., I. Woolard, A. Finn and J. Argent (2010), "Trends in South African Income Distribution and Poverty Since the Fall of Apartheid", *OECD Social, Employment and Migration Working Papers*, No. 101, OECD Publishing, Paris, January, *http://dx.doi.org/10.1787/5kmms0t7p1ms-en*, for South Africa; in OECD (2010), *Employment Outlook 2010: Moving Beyond the Jobs Crisis*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/888932292840*.

The high exclusion rates are mirrored in Gauteng Province. According to figures from the Department of Social Development (DSD), in 2008 only about 79% of all those eligible to receive the child support grant in South Africa were actually receiving it. In this respect, Gauteng was doing worse than the national average. Approximately 29% of those eligible in the province were not receiving the child support grant, and a lower

percentage of all children there were deemed eligible than in any other province except Western Cape (National Economic Development and Labour Council, 2008).

To improve targeting, the national government could assist municipalities in the Gauteng city-region by establishing a national poverty line. Targeting is notoriously hard to do properly, given data constraints. Many unsuccessful attempts have been made to establish a national poverty line, as Charles Meth and others have repeatedly argued in technical papers. In 2007, the National Treasury and Statistics South Africa issued a national poverty line, concluding that well over 50% of the population was living in poverty. Others have estimated that the poverty rate may be anything up to 70% (Magasela, 2005; Leibbrandt and Woolard, 2006). There have been attempts to establish a poverty line at sub-national level that do not correspond to methods used or recommended at national level. The Social Assistance Department of the City of Johannesburg has also gone down this route, drawing up its own poverty line and trying to determine who should receive subsidised social services and social grants.

In the absence of a clear poverty rate, the cost of targeting increases. In situations where clear poverty lines and rates are difficult to establish, universal allocations and non-means-tested benefits are often seen as the most efficient approach. Although South Africa already has this approach, there are challenges, most notably that many households that do not need free services get a quantum of this subsidy. In this context, municipalities' attempts to arrive at more sophisticated mechanisms to determine households in poverty are to be supported. However, the challenges of differential systems across municipalities need to be recognised, and municipalities in the city-region would find it beneficial to share experiences and system developments.

Providing support to the working poor in the informal economy

A specific approach towards the informal economy needs to be considered given its capacity to provide income-earning opportunities. Although informal firms, in many cases, cannot guarantee safe and fair work conditions for workers, they may also represent incubators for entrepreneurship in the most impoverished areas of the city-region. One study of South Africa, for instance, shows that it is not necessary to acquire a formal sector job in order to achieve earnings gains; a majority of earnings gains due to mobility were achieved within the informal sector (Cichello et al., 2005). Therefore, a regional policy aiming at improving the performance of the local labour market could detect the formal-informal networks and offer the informal firms the possibility of regularising their position, while retaining the advantage of being flexible and with low operational costs. Such a policy would also make it possible to analyse whether national and local regulations (e.g. labour market regulation or land-use regulation) cause informality and marginalise some productive forces within the regional economy (OECD, 2008a). An engagement with the informal economy would counteract prevailing attitudes which tend to perceive the informal economy as a marginal and underdeveloped part of the economy that needs simply to be eradicated.[42]

Further measures could be taken to develop a jobs creation model for workers in the informal economy. International evidence, particularly from Mumbai's Self-Employed Women's Association (SEWA), suggests an ample possibility of establishing labour-intense projects that combine income and employment generation with increased recycling. Cities like Istanbul and Bogotá face similar issues and have designed a range of alternative programmes that may be of interest to policy makers in Gauteng; these include the construction of markets for relocated vendors, the use of zoning for informal

commerce, and the support of skills training programmes for unskilled workers (OECD, 2008d; Donovan, 2008).[43] The example of Johannesburg's Linear Market could be replicated throughout Gauteng. In this project, the Metropolitan Trading Company (MTC) aims to expand informal operations into more viable entities by providing business incubators. Progress has been made towards the formation of between 25 and 30 co-operatives, and MTC's facilities accommodate approximately 5 000 informal traders (City of Johannesburg, 2009a).

Labour market programmes for workers need to ensure that workers have adequate mobility to transition from the informal to the formal economy if the conditions are appropriate.[44] Workers in Gauteng who are confined to informal markets are at risk of remaining there. To encourage a transition from bad informal work to better informal jobs, labour market programmes should aim to increase synergy between the formal and informal economies. This should remove barriers to mobility that may make good jobs inaccessible for certain individuals. In South Africa, certain factors have been associated with lower mobility rates, such as large initial household size, poor initial education, poor initial asset endowment, poor initial employment access (Woolard and Klasen, 2005), gender and race (Michaud and Vencatachellum, 2003).

International experience suggests that reducing the costs of registering a business could create conditions for the progressive empowerment and inclusion in the formal economy. The recent experience of the Czech Republic, Hungary, Korea, Mexico, Poland, the Slovak Republic and Turkey illustrate significant progress in simplifying business start-up regulations over the past five years, reducing both the average number of days required to register a business and the cost of doing so (OECD, 2008a). For example, in 2005, the Czech Republic simplified the registration process by introducing standard application forms for business regulation and a "silence is consent" rule, whereby applications that are not approved after five days are automatically approved. The Slovak Republic cut business start-up costs over the course of a few years by transferring the responsibility for approving business registrations from judges to court clerks, introducing standard documents, clarifying the grounds for rejecting registration applications and simplifying tax registration procedures. In Turkey, a number of steps in the business registration process were combined into one and delegated to chambers of commerce. Application forms were also standardised and shortened and registry officers given better training (Bruhn, 2008; Kaplan, Piedra and Seira, 2007). Single-window services that bundle a number of procedures can also help limit the cost of registering a new business, as in the case of Mexico's SARE (*Sistema de Apertura Rápida de Empresas*) (Jütting and de Laiglesia, 2009).

In South Africa, the current SETAs are primarily for formal enterprises and do not ensure that all workers have equal access to the means of skills development. This levy scheme is oriented to selected employees in selected firms and, perhaps unintentionally, to those in the formal economy. This tends to create a system where skills are given to core workers ("insiders") while leaving out "outsiders". It is hard to envisage how this can create a "staircase" to climb from the second to the first economy, as one analyst has described the government's objective (Hirsch, 2005). Although there are discretionary grants for SETAs to use for workers who have not contributed levies, "learnerships" are primarily for formal enterprises, not for workers outside the core economy.

A specific vocational training programme for informal economy workers in Gauteng is appropriate. The Technical and Vocational Skills Development (TSVD) initiative in Africa (OECD, 2008b) may provide a reference for Gauteng, given its aim to move workers not only out of informal work, but mostly to move them out of bad jobs

(Box 2.9). In terms of matching and co-ordination schemes, they facilitate moves from informal to formal sectors by creating recognition standards for skills that are useful and learned outside the formal sector, as well as support for entrepreneurship initiatives. In respect to education and training for those working informally, a recent report by the French Development Agency, the *Agence française de développement* (Walther, 2007) stresses the following three points:

- the need to offer training early on and to acknowledge the fact that informal employment may be the only training, conducted on the job, for some workers;
- restructuring traditional apprenticeships to combine theory and practice; various initiatives are taking place within the informal sector to transform traditional apprenticeships into dual apprenticeships (Walther, 2007, cited in Jütting and de Laiglesia, 2009);
- stressing the role of local governments in providing training in the informal sector, because public vocational education and training focus mostly on skills needed in the formal sector, neglecting current labour market needs in Africa.

Box 2.9. **Technical and vocational training in Africa**

The 2008 *African Economic Outlook* (AEO) (OECD, 2008) provides a snapshot of "Technical and Vocational Skills Development" (TVSD) in 34 African countries at different levels of economic development and with different labour market needs. It demonstrates that opportunities offered by the private enterprise sector, including the informal sector, hold the greatest promise for the training of Africa's youth and the next generation of entrepreneurs likely to provide employment and prosperity. TVSD, it is argued, should be an integral part of any economic growth strategy to help the poor, and more attention should be paid to the fact that 90% of TVSD is done in the informal sector.

The report reveals that in the more developed African countries, high growth and productivity in some sectors and regions may often co-exist with low productivity and persistent poverty, mainly in the large informal economy. Training can promote a shift to the formal economy in many developing countries. This can include improving access to skills development outside high-growth urban areas, combining remedial education and employment services with technical training, implementing systems to open up jobs in the formal economy to those who have acquired skills informally, and targeting entrepreneurship training to encourage small enterprises to join the formal economy.

Micro-credit can reinforce training and make it more effective, playing a crucial role in helping informal sector workers progress from the TVSD phase to enterprise creation, consolidation and development. The "first job" law implemented in Angola since 2006 is a good example of how the Angolan Government aims to help trainees find work, a prerequisite for successful training schemes. Another example of good practice is the strategic partnership developed by the African Development Bank and the ILO to support growth-oriented women entrepreneurs, which has been applied in Cameroon, Ethiopia, Kenya, Tanzania and Uganda.

The livelihood of the large majority of workers in the continent depends on income-generating activities in the subsistence agriculture sector and the urban informal economy. Hence the importance of effective methods for improving access to high-quality and relevant skills training in rural communities to improve agricultural productivity or to meet off-farm labour demand. Concrete actions should include improving agricultural and rural extension services and combining technical and entrepreneurship training in local communities.

Box 2.9. **Technical and vocational training in Africa** *(cont'd)*

Important reforms are under way in many African countries to strengthen training systems to adapt them by introducing or strengthening partnerships between school-based training and apprenticeships in both the formal and informal sectors. For instance, Benin, Ghana and Mali are making important efforts to modernise traditional apprenticeship schemes and to integrate them into a national training system. These promising examples take the form of dual apprenticeship systems, where craft enterprises co-operate with training centres provide training and issue certificates attesting to the skills possessed by informal sector workers. These reflect a trend towards a more holistic approach to education, training and employment than in the past.

Source: OECD (2008), "Technical and Vocational Skills Development in Africa", *African Economic Outlook 2008*, OECD Publishing, Paris.

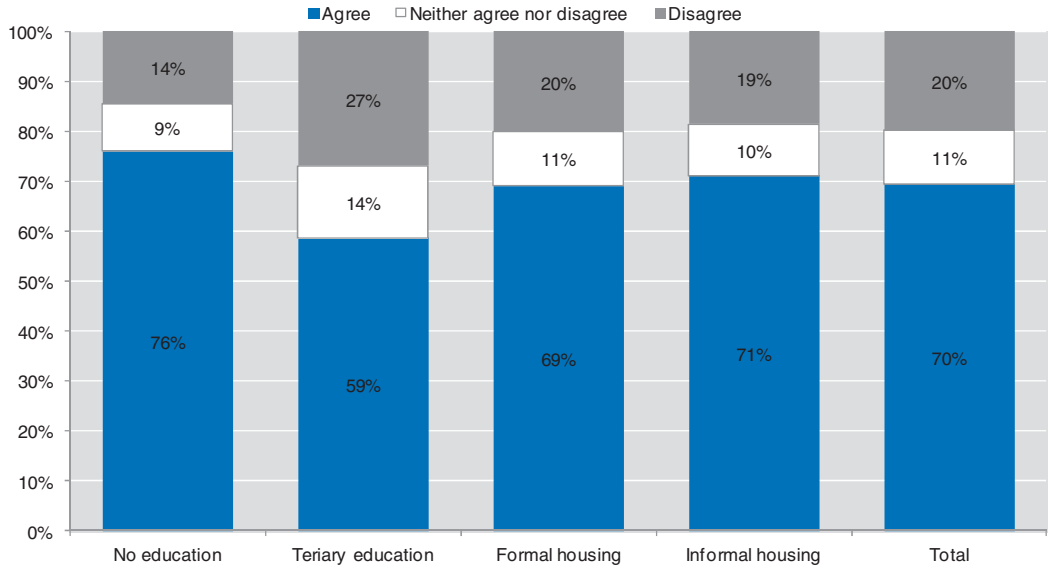
Based on such evidence, the South African Department of Labour's recent launch of a structured learnership system in South Africa's informal economy should be widely supported. This experimental learnership system seeks to promote business creation and self-employment, through training schemes and grants for start-up activities.[45]

Integrating immigrants into the Gauteng city-region economy

Demographic evidence suggests that migration will continue to be a strong driver and that tensions have grown between Gauteng's residents and foreigners. The influx has been a source of growing social tension, which flared into ugly violence in May 2008 with a spate of killings of mostly non-South Africans. Policies should be assessed by whether or not they would help address the tensions, before something much worse than the events of May 2008 takes place. One recent survey commissioned by the Gauteng City-Region Observatory included a Likert item that stated: "Foreigners are taking the benefits meant for South Africans". The results show that a belief that this is the case seems to unite Gauteng residents, regardless of dwelling type or educational level (Gauteng City-Region Observatory, 2010b) (Figure 2.6).

Though an exhaustive assessment of immigrant skills has not been conducted in Gauteng, the region manages to attract highly skilled immigrants who face many challenges gaining employment in their given profession, and their skills are sometimes underutilised as a result. Increasing the use of existing labour-matching services could increase the integration of immigrants. Immigrant entrepreneurship could become a vital economic force if more resources were dedicated to confronting the problems immigrants face in establishing businesses, which may include poor access to information, poor credit, difficulty in obtaining recognition of professional skills, and lack of involvement in professional associations.[46]

Figure 2.6. **Responses to survey question, "Foreigners are taking benefits meant for South Africans" by dwelling type and education**



Note: Percentages may not add up to 100 due to rounding error. The sample size of the study was 5 820 respondents in Gauteng.

Source: Gauteng City-Region Observatory (2010), *2009 Quality of Life Survey*, GCRO, Johannesburg.

The involvement of professional associations would help expedite the integration of immigrants. As more highly skilled immigrants arrive in the Gauteng city-region, the accreditation of foreign qualifications and experience will become increasingly important. Many of the regulated professions in the Gauteng city-region are controlled by local regulatory bodies. Often these organisations have the authority to set entry requirements and standards of practice, to assess applicants' qualifications and credentials, to certify, register or license qualified applicants, and to discipline members of the profession or trade. Toronto provides a useful reference for more actively engaged professional associations. For example, Professional Engineers Ontario, a professional association with regulatory authority over the engineering profession, allows prospective immigrants to Canada to take written examinations before their arrival and issues provisional licenses to applicants who have satisfied all the licensing requirements but the minimum 12 months of acceptable engineering experience in Canada. Professional associations also have a role in providing "bridge-to-work" programmes, which help immigrants to obtain work experience in Canada. Most of these programmes are funded by provincial and federal governments and facilitated by professional associations, education institutions and not-for-profit organisations (OECD, 2010a).

Improving immigration statistics in South Africa to better inform policy

The knowledge base on immigrant populations needs to be increased to inform public policy tools. Currently, Gauteng's policy officials do not know how many immigrants live in Gauteng or the level of their skills. Estimates have ranged between 3% to 30% of the population, which is not helpful for fine-turning policies to neighbourhoods and the needs of immigrant groups. This is unfortunate given the role that immigrant groups have

been shown to play in other contexts (Box 2.10). A robust evaluation of immigrant settlements and employment patterns in Gauteng could give policy makers a better picture of current trends.

Box 2.10. **Immigration, innovation and business performance**

In a study on the relationship between skilled immigration and innovation in the United States from 1950-2000, a one percentage point rise in the share of immigrant college graduates in the population was found to increase patenting by 8-15%. The equivalent range for immigrants with post-college education is 15-33%. Kerr and Lincoln (2008) have quantified the impact of changes in admission levels of immigrants with H-1B visas, which govern the admission into the United States of most temporary immigrants employed in patenting-related fields. They find that total invention has increased in association with higher admission levels, primarily through the direct contributions of ethnic inventors over the 1995-2006 period. Chellaraj, Maskus and Mattoo (2005) find that both international graduate students and skilled immigrants have a significant positive impact on future patent applications, as well as on future patents awarded to university and non-university institutions. Their central estimates suggest that a 10% increase in the number of foreign graduate students raises patent applications by 4.7%, university patent grants by 5.3% and non-university patent grants by 6.7%. Increases in skilled immigration also have a positive, but lesser impact on patenting. Growth in a city's share of ethnic patenting has been found to correlate closely with growth in total national patenting. Across a sample of US metropolitan regions over 1975-2004, an increase of 1% in a city's ethnic patenting share correlates with a 0.6% increase in the city's total invention share. This coefficient is remarkably high, as the ethnic share of total invention during this period is around 20% (Kerr, 2008a). International patent citations confirm that knowledge diffuses through ethnic networks, and manufacturing output in foreign countries increases with an elasticity of 0.1-0.3 to stronger scientific integration with the United States (Kerr, 2008b).

Source: Chellaraj, G., K.E. Maskus and A. Mattoo (2005), "The Contribution of Skilled Immigration and International Graduate Students to U.S. Innovation", World Bank Manuscript, Washington, D.C.; Kerr, W.R. and W.F. Lincoln (2008), "The Supply Side of Innovation: H-1B Visa Reforms and US Ethnic Invention", *Harvard Business School Entrepreneurial Management Working Paper No. 09-005*; Kerr, W.R. (2008a), "The Ethnic Composition of US Inventors", *HBS Working Paper 08-006*; Kerr, W. (2008b), "Ethnic Scientific Communities and International Technology Diffusion", *Review of Economics and Statistics*, 90(3): 518-537; OECD (2010), *OECD Territorial Reviews: Toronto, Canada 2009*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264079410-en*.

Currently the Gauteng city-region lacks a monitoring tool to evaluate the implementation and outcome of immigrant integration programmes. Governments in the Gauteng city-region could undertake an exhaustive audit of the integration services that are provided through such programmes as the City of Johannesburg's Migrants' Help Desk. Improved monitoring and accountability could be achieved by adopting the metrics developed by the INTI-CITIES' Benchmarking Integration Governance in European Cities project.[47] Co-financed by the European Commission, this programme developed a rigorous assessment model that includes indicators for assessing integration governance structures at the local level. Its benchmark questions on the performance of inter-departmental committees for migrant integration, the public reporting of results of immigrant integration policy, and the cost-effectiveness of inter-departmental work on integration, exceed current evaluation frameworks in the Gauteng city-region. A more rigorous system is required, especially given the fragmented nature of integration services: housing, education and employment are all handled by different departments.

Improving labour market security for all workers

Measures are needed to regulate the spread of labour broking in the Gauteng city-region. Labour broking, the involvement of intermediaries who become the agents responsible for providing the labour of others to employers, is a way for firms to circumvent labour regulations. It has been suggested that the main reason the mining sector has made extensive use of labour brokers has been to avoid paying wages and benefits set by collective agreements accepted by the Chamber of Mines. The trade unions, which have support within the government and some of the administrative agencies, have urged a ban on labour brokers, and the African National Congress, led by the Minister of Labour, declared its intention to enact a ban in the 2009 election campaign. By mid-2010, however, broking was still not banned, possibly because it was prevalent before the Constitution was written and allowed to grow subsequently.

Momentum has been building to encourage socially decent practices and discourage "sweatshop" practices. A recent development has been resort to Codes of Good Practice, a soft-law approach to regulation. There has been considerable discussion over codes and, as of mid-2010, only some of those proposed or in draft form had been agreed in the National Economic Development and Labour Council (NEDLAC). In principle, they commit all levels of government and all "social partners" to abide by them. After protracted debate, the Code of Practice on Public Works was agreed. Another on HIV/AIDS in the workplace is highly relevant and valued. Together, they represent an important instrument used by government at all levels to try to reach consensual flexible agreements that the business community, the trade unions and the wider socio-economic community can respect.

Additional measures, particularly better monitoring and reporting between all levels of government, are needed to improve occupational health and safety. South Africa's poor workplace safety rankings are partly, if not largely, a legacy of apartheid labour practices and of the dominance of the mining industry in the economy. In the ILO's country rankings on labour-related security, South Africa ranked 60th out of 95 countries for which comparable occupational health and safety data were available, below Argentina, Brazil, Mexico, Egypt and Mauritius (ILO Socio-Economic Security Programme, 2004). Measures are especially needed for HIV-positive people to participate in social and economic life, although there has been no subsidy scheme to boost job prospects directly. The Code of Practice developed under the aegis of NEDLAC deserves commendation and recognition.

The Gauteng Provincial Government should encourage better monitoring of health and safety in the workplace, given the fact that the province recorded the highest number of deaths and injuries from industrial accidents in 2008-09 (75 deaths and 408 injuries). Gauteng's record reflects its larger population and high concentration of manufacturing industries, which nationally account for nearly 40% of all casualties (Department of Labour of the Republic of South Africa, 2009). The Department of Labour is responsible for the national system of labour inspection, which has suffered from a critical shortage of personnel for some years. For an estimated 900 000 establishments or workplaces in South Africa, only 900 labour inspectors are employed (Ngoepe, 2010). A large number operate in the Gauteng Province, of which Johannesburg accounts for about 66 (the number fluctuating from week to week). This figure is woefully inadequate, implying that each workplace in the city is visited only once in every four years. Consequently, many accidents, especially those that do not result in fatalities, go unreported.

National labour policy institutions are in need of alignment with the Gauteng city-region

It is key for the Gauteng Provincial Government to align and co-ordinate its labour policy with the wide number of national institutions involved in labour market governance. The Constitutional Court[48] and NEDLAC have played pivotal roles as vehicles for negotiating and agreeing on social, economic and labour market policies.[49] The involvement of trade unions in the economic governance of post-apartheid South Africa has been stronger than in many OECD member countries. Because the unions were embedded in the institutional structures created in the late 1990s, and because they remained part of the government coalition, their involvement has survived a steady loss of membership. Along with the smaller Federation of Unions of South Africa (FEDUSA) and the National Council of Trade Unions (NACTU), the Congress of South African Trade Unions (COSATU) remains influential directly and indirectly at all levels of government. COSATU, still the largest civil society organisation in South Africa, remains a powerful part of the governance structure.[50]

The Gauteng Provincial Government could co-operate with the CCMA to work on improvements at the provincial level. As one of the great post-apartheid institutions set up in the early phase of building a national system of regulated flexibility, the commission acts as a social safety valve, dealing with numerous individual disputes between employers and employees as well as "interest" cases, and acting as a conciliator and eventually arbitrator between employer bodies and unions. Despite its budgetary limitations, it has played a very positive role in limiting social tensions and in creating and preserving a deliberative labour policy. It now performs functions that go well beyond the terms of reference one would expect from its name. Its budget was based on the expectation that it would handle about 40 000 cases each year. In practice, it has had to handle many more – about 156 000 in 2009. The most relevant point for the Gauteng city-region is that the Johannesburg office of the commission has been the least "efficient" of all the provincial offices, according to CCMA's own assessment, in terms of dealing with disputes, completing cases and the time it takes to do so.[51] This may reflect the scale of its workload.[52]

Bargaining council agreements have decreased throughout South Africa and are not a major force in the labour market. They cover at most about 2 million workers, and in many respects do not restrict the vast majority of firms over which they have jurisdiction. The number of bargaining councils has been shrinking for years; not all of them are national in coverage, and by no means all those "accredited" to the CCMA are fully operational. At their zenith in the 1980s, over 100 bargaining councils were in operation, but by 2010, only 47 were accredited, only about 27 of those were fully functional and some were not national in scope. In addition, they appear to have had only a modest effect on wages, generally raising only the very lowest wages in sweatshop firms. In general, collective bargaining only covers about a third of all employees (and thus a much smaller proportion of all workers). Only in the public sector have bargaining council agreements had much of a positive effect on wage levels.[53]

Though their impacts are unclear, public works programmes have long featured in the armoury of South African labour policies at the national, provincial and municipal levels, but they remain highly controversial.[54] The latest incarnation has been the Expanded Public Works Programme (EPWP) (Box 2.11). Phase I concluded in March 2009 and Phase II began the following month, with a target of creating 500 000 jobs before the end of 2010 and another 4 million by 2014. Within the EPWP is the Community Works

Programme (CWP), under which a person can be employed continuously for two days a week throughout one year, if communities identify tasks that need to be done, such as fencing or cleaning. An EPWP incentive is offered to municipalities if they meet so-called "employment intensification targets" and to non-profit organisations that can show that they will be generating new jobs.[55] The EPWP is a very ambitious government scheme: it is said to have "created" 1.65 million work opportunities between 2004 and 2009, of which Gauteng accounted for 260 000. The Gauteng Provincial Government announced in 2009 that it aims to create 1 million jobs, a quarter of the national target, by 2014 through the EPWP. Nevertheless, it is far from clear how great a deadweight effect there is (creating jobs that would have been created in any case), or whether it is crowding out commercial private-sector economic activity. Often, such schemes do not reach the poorest, most obviously those who cannot work. And public works tend to have high administrative costs, since projects must be designed, eligible workers identified and recruited, and so on. Moreover, one earlier study of the EPWP (McCord, 2005) found that the jobs created were short-term, concentrated in labour-intensive, low-productivity activities and involved little or no skill development. The work readiness of beneficiaries at the end of the programme, and the take-up and success of individual EPWP beneficiaries in the private sector, has not been evaluated.

2.4. Expanding and rescaling economic opportunity

Expanding innovation capacity in Gauteng

A main obstacle for the Gauteng city-region, as it makes the transition towards a more inclusive and advanced knowledge-based economy, is its low innovation capacity. As noted in Chapter 1, enterprises are limited in developing innovative activities because of a lack of funding, because markets are dominated by established enterprises, and because of a perception that the costs of innovation are too high. This is amplified by a low rate for the establishment of start-up businesses and a high rate of business turnover, especially for early-stage businesses. Fortunately, the Gauteng city-region has a strong base to build on, since the province has the highest per capita R&D expenditure, the highest number of patents, and a level of R&D as a percentage of GDP (1.45%) comparable to the OECD regional average (1.58%).

From a fragmented innovation policy framework…

Innovation led-policies in the Gauteng city-region derive from two levels of government.

i) The central government is responsible for importing, developing, inventing and diffusing new technologies, along with funding institutions that result in innovation and R&D, e.g. higher education and public and private research institutes. These activities are governed by two ministries: Science and Technology, and Education. Since 1994, policy makers have made a conscious effort to improve and streamline the governance of the national innovation system. The South African Government built up a strategic competence that enables it to provide broad policy support to increase the amount and improve the direction of R&D expenditure.[56] Nevertheless, no high-level body is responsible for determining, or advising the government about, the entire spectrum of research and innovation policy. Fragmentation of funding and duplication of initiatives has spread financial resources too thinly over too many organisations and across too many activities in science, technology and innovation (OECD, 2007).

Box 2.11. **South African Public Works Programme**

The South African Expanded Public Works Programme (EPWP) was launched in 2004, as the new version of the National Public Works Programme (NPWP) and the Community-Based Public Works Programme (CBPWP). It is the third-biggest infrastructure spending programme in the world and a key component of the South Africa's social protection strategy. The programme provides short-term work to the unemployed and to marginalised groups, mainly unskilled, poor and youth in four areas (infrastructure, economic sector, environment and social sector), with infrastructure being the most important. The programme aims not only to provide a temporary job to poor, unemployed persons, but also to improve their skills through training and offering "exit" strategies at the end of their participation in the programme.

The EPWP has been criticised, however, for its limited capacity to pursue both objectives (Hemson, 2007). As a result, the second phase of the scheme, announced in April 2009, placed more emphasis on employment generation relative to training in order to maximise the benefits from job creation. The quality of jobs offered by the EPWP is fairly low, both in terms of job duration and wages. As in the Indian programme, average job duration is shorter than initially stipulated, especially in areas with high unemployment rates, because of the pressure to rotate jobs (Lieuw-Kie-Song, 2009) Wages are low (Hemson, 2008). In addition, low spending, possibly due to unclear funding conditions at the time project decisions are taken, and weak implementation capacity, further limit the programme's effectiveness. The second phase aims to address these challenges by improving co-ordination across governmental bodies and providing incentives to expand the programme and increase job duration.

Source: Hemson, D. (2007), "Mid-term Review of the Expanded Public Works Programme: Component 3: Analysis and Review", commissioned by Southern Africa Labour and Development Research Unit (SALDRU), University of Cape Town, Rutgers School of Law (State University of New Jersey, United States) and ITT (United Kingdom), October; Hemson, D. (2008), "Expanded Public Works Programme: Hope for the Unemployed?", *HSRC Review*, 6(3), September; Lieuw-Kie-Song, M.R. (2009), "The South African Expanded Public Works; Programme (EPWP), 2004–2014", presented at the conference "Employment Guarantee Policies: Responding to the Current Economic Crisis and Contributing to Long-Term Development", a collaborative project of the United Nations Development Programme, Regional Bureau for Latin America and the Caribbean, and the Bureau for Development Policy, in partnership with the Levy Economics Institute of Bard College, New York, June, *www.levy.org/pubs/conf_june09/conf_june09_files/presentations/Session1b_Maikel_Lieuw-Kie-Song.pdf*; and OECD (2010), *OECD Employment Outlook: Moving Beyond the Job Crisis*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/empl_outlook-2010-en*.

ii) The Gauteng Provincial Government funds a wide number of economic development initiatives related to innovation. These initiatives are mainly funded through the Gauteng Department of Economic Development (DED), whose objectives include "increased trade and investment; investment in strategic economic infrastructure that boosts the competitive advantages of the key sectors of the economy; [and] contributing to an ethical business and regulatory environment" (Gauteng Department of Economic Development, 2008). The DED funds, in part, the Innovation Hub Science Park, which seeks to incubate innovative new companies and enhance the synergy between industry, academia, and public research institutions.[57] Currently, however, the Gauteng Provincial Government does not have an approved innovation strategy or a specific regional innovation agency. It has a draft innovation strategy, yet to be approved at the time of writing, which proposes the establishment of an Innovation Development Office (IDO), with the authority and mandate over innovation-related activities, policies and strategies of the department. It is unclear how this office and the Innovation Strategy, if approved, would support the range of provincial policies already in place, including:

- Gauteng Employment Growth and Development Strategy;

- Gauteng Industrial Policy;
- Gauteng Integrated Energy Strategy;
- Information and Communication Technology Strategy;
- Local Economic Development Strategy.

The draft Gauteng Innovation Strategy (2010) recognises the need to change the paradigm of innovation in South Africa from closed and top-down to horizontal and open source, but it appears to be following a top-down model. The draft strategy relates the Gauteng Regional Innovation System to the National System of Innovation by noting that South Africa has adopted a top-down, government-centred approach to innovation, leaning towards economic innovation, with ideas poured in at one end and consumers receiving a product at the other.[58] The Gauteng draft strategy aims to create what appears to be a relatively isolated Innovation Development Office with a small staff within the Gauteng Department of Economic Development. It is not clear how this will create an extensive network consulting with the private sector. The call for the creation of collaboration networks in eight weeks appears overly ambitious, given the scale of work entailed in building coalitions across the province's many business sectors and communities.

…towards a more coherent regional innovation system….

As the Gauteng Provincial Government considers the creation of a regional innovation agency, it needs to carefully weigh both the advantages and disadvantages of such an agency. OECD (2011) has documented that regional innovation agencies may offer a stability that helps policy makers maintain their attention on long-term innovation objectives. This responds to the concern that long-term objectives would otherwise be overshadowed by more politically attractive objectives that deliver quicker or more visible results (brick and mortar-based interventions, for example). On the other hand, a dedicated innovation promotion agency could militate against the possibility of achieving more integrated policy mixes in other aspects of economic development, e.g. infrastructure, skills and training, export promotion, etc. It also demands a range of varied competences within the agency and an explicit funding source.

It is not clear whether the prospective Innovation Development Office would be based on a "light" networked model or a "heavy" centralised model. A "light node" agency would need to establish its legitimacy and its capacity to co-ordinate a wide array of regional actors supporting innovation. Aligning its mission and activities around a regional innovation policy would certainly not be easy to achieve. One model to consider is the Agency for Innovation through Technology (IWT) Flanders model, which has created a network of innovation intermediaries in Flanders, relying on a robust monitoring system and aiming to provide coherence and visibility to the support system (OECD, 2011). Several conditions would be needed for such a model, in particular a clear vision for regional innovation policy; a good knowledge of the regional actors; powerful incentives to ensure joint performance of the system; and credibility of the agency in charge of co-ordination. A centralised model ("one-stop-shop" agency) would run a higher risk of sclerosis and immobility, due to its heavy structure. A crucial question in Gauteng would be the internal challenges of developing internal agility and flexibility. The professionalism of the staff and goal-oriented management practices and evaluation procedures would be needed for such a model to succeed.

The Gauteng Provincial Government would also need to clarify the menu of services for the new Innovation Development Office, which could include infrastructure support, "soft" support to firms and financial assistance (Table 2.3). Because the office would be part of the innovation system, the definition of its portfolio should start with a consideration of the system as a whole, and not only internal agency issues. The selection of services would depend on the office's internal capabilities for delivering the services effectively and the availability of public and private services available to the target groups. The private sector could be consulted for input in developing the list of services, and the Gauteng Provincial Government could consider creating an advisory board of company representatives for the new office.

Table 2.3. **Types of services delivered by regional innovation agencies**

Type of support	Examples
"Soft" support to firms	Generic support
	Information provision
	Awareness raising
	Training
	Stimulation and/or running of networks and clusters
	Promotion of internationalisation
	Promotion of foreign investors
	Individual support
	Coaching, advice
	Training
	Needs assessment, audit
	Support for start-ups
	Access to finance, intermediary with business angels
	Science and technology services
Finance	Delivery of public subsidies and loans
Infrastructure provision	Incubators
	Science parks
Support to policy	Support to policy design (e.g. structural funds programmes)
	Monitoring and evaluation of regional policies
	Acting as a node for regional partnership
	Acting as a central co-ordinating body for a network of innovation support actors
	Regional marketing

Source: OECD (2011), *Regions and Innovation Policy*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264097803-en*.

The Gauteng Innovation Development Office would be most effective if it embodied multi-level governance tools to increase synergy with national programmes and reduce duplication. Before selecting appropriate tools, a proper diagnosis of the source of multi-level governance challenges would need to be conducted. For example, if the challenge is financing, this can be addressed using several tools, such as project co-financing or developing contracts to provide financing for large-scale scientific initiatives. In 2010, OECD member countries reported that the most important co-ordination vehicles for science and technology policy were those that are not always formalised, such as consultation processes (formal and customary) as well as regular dialogue. For regional development policy more generally, contracts were among the most commonly used instruments. In addition, the trend is for most countries to use several tools simultaneously, including consultation, regular dialogue, agencies, contracts, project co-financing and national territorial representatives (OECD, 2011).

Inter-firm linkages could be improved by a greater experimentation with clusters, which are of limited number and confined to the manufacturing sector. Cluster policy in Gauteng is almost exclusively focused on the manufacturing sector. One early policy response was the Motor Industry Development Programme, which continues to be organised through the Automobile Industry Development Centre (AIDC), and which addresses the whole of the industry's domestic supply chain. It acts as a vehicle to provide comprehensive multi-functional support in areas such as skills development and training, supplier and supply chain development, upgrading activities in specific segments of the supply chain (e.g. tooling), as well as facilitating business access to government investment financing and other support programmes (OECD, 2007).[59] Clusters such as these could be applied more widely to support other sectors. In the tourist industry, for example, the planning of tourism routes involves developing co-operative planning arrangements and relationships between different localities. Tourism clusters can operate at a number of geographical scales, but route development can be of special importance and can offer economic opportunities (Lourens, 2007; Rogerson, 2007).

…that fosters inclusive, open and synergistic innovation

An explicit emphasis on "social innovation" is merited in the Gauteng city-region, given the high level of unemployment and the barriers faced by small businesses. Social innovations require shared commitment and mobilisation of several stakeholders, including social entrepreneurs, communities of practice and universities. One focus could be improving financial management skills of entrepreneurs to help elevate business development and innovation. This would respond to the challenges highlighted in the 2003 Global Entrepreneurship Monitor report for South Africa, namely the widespread cash constraints amongst entrepreneurs from disadvantaged communities with registered businesses and cash-flow difficulties. Through a social innovation programme, firms could acquire skills in active debtor management and inventory-keeping. Implementing such practices has been shown to increase the probability that a firm will succeed in an application for term loan finance (Herrington et al., 2010). Governmental assistance for financial management could provide better support to upgrade these skills. Models such as Toronto's Centre for Social Innovation or New Orleans' Idea Hub provide useful references for community-based social innovation models.

Policies developed at the state level in Mexico offer several models to support the innovation capacity of small and medium-sized businesses. Michoacan, for example, has taken several initiatives to facilitate the environment for SMEs. The state has made one-stop shops a high priority, reflected by their high rankings in reducing start-up burdens, and has developed an initiative to combine all the SME financing sources in the state into a common fund. Yucatan has also launched a clearinghouse entity that is seeking to serve as an information broker on the different publicly supported financing support programmes. Puebla's Institute for Productive Competitiveness (IPPC by its Spanish acronym), whose board includes higher education institutions, members of the private sector and unions, has designed a programme to support SMEs that seeks to identify on a case-by-case basis factors that would have the most impact in such firms. Similarly, Queretaro has developed a database by economic sector as a way to attract firms, based on existing suppliers in the state. This online tool shows for each sector the name of potential suppliers as well as their capabilities and production processes. Finally, the state of Aguascalientes has an innovation support programme for SMEs (Box 2.12).

Box 2.12. **The Innova Programme in the state of Aguascalientes, Mexico**

The main objectives of Aguascalientes Innova are: *i)* to develop innovation projects for participating SMEs; *ii)* to increase the chances of a higher income level among the owners of the participating firms and their employees; and *iii)* to develop a general awareness of the impact that innovation can have in a globalised business environment. The programme, currently in its pilot stage, has served 39 local SMEs and trained approximately 700 people on innovation. The programme is subsidised by the state's S&T Council. An outside contractor, iNovel Consulting, selects SMEs and invites their CEOs for training. The programme has triggered awareness of the impact of innovation within the small business community. Several firms have already developed, selected and scheduled their own innovation projects. The programme rests upon three pillars: *i)* a methodology where SMEs can develop high-impact innovations; *ii)* a vision to select and pick the right innovative ideas among the many posted by participants; and *iii)* a task-scheduled process setting out the strategic sequence of activities in the implementation and launching of the innovation projects. So far, the firms are innovating in new product development, new business models and technological and process upgradings. The programme has begun to raise awareness among SMEs about the fact that a firm's competitiveness is not only a question of costs, but often a matter of product differentiation and reinvention, i.e. the kind of competitiveness that is sustainable over time.

Source: OECD (2009), *OECD Reviews of Regional Innovation: 15 Mexican States 2009*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264060135-en*.

The draft Gauteng Innovation Strategy's endorsement of open innovation networks could be supported by policies aimed to fund emerging clusters. Though its emphasis on creating "open innovation social networks" is valid, additional policies could be instituted to assist companies on the outside to join the discussion and to develop new products. The Veneto Region in Italy has successfully adopted a bottom-up policy for productive districts that may provide a reference for Gauteng. SMEs and other regional actors sharing a common strategy and business identity can apply to become a new "constituency" and therefore become recognised as a productive district (Box 2.13).[60] A similar approach could be adopted to create "local communities" specialised in particular service or productive systems in the Gauteng metropolitan area. Moreover, the policies of the Gauteng city-region would need to level the playing field and ensure that an open innovation policy benefits smaller, diffuse groups, which may not have the tools necessary to compete with bids from larger, more organised companies and trade associations. In so doing, Gauteng's businesses will be better able to confront a cardinal economic challenge identified by the national government, "economic concentration and price collusion in key parts of the economy, which raises costs and limits innovation and new enterprise development" (Government Communications and Information System, 2010).

Box 2.13. **Supporting emerging productive districts in Veneto: Law 8/2003**

The law instituted a three-stage competitive process:

i) **Self-organisation and self-nomination of the districts intending to play a productive role in the regional context.** The tasks of selecting districts and beneficiaries of public aid are not given to experts who under conventional programmes measure the existence of a district on the basis of objective parameters. A district in itself is not considered a partner of any particular interest to the administration; the Veneto Region only recognises districts *per se*: networks of operators (with a strategic function in the regional economy). To be eligible, applicants need to be able to present "figures" in line with the principles of the law, which mandate a certain number of participants, co-operative links along a specific value chain, certification by a local chamber of commerce and a business plan. The regional government does not intervene to support areas that are not ready to co-finance their own proposal for strategic partnership with the administration.

ii) **Open calls for tender for projects that would meet the aims and conditions set by the districts.** In contrast to other regions, the demand for investment in the Veneto, expressed by the main actors in the district, is the basis for issuing open tender calls for projects. The offer may, however, come from any agent, local or external, provided it has the required characteristics, the ability to carry out the work and the funds to cover at least 60% of the costs. The maximum public aid of 40% (or less) of the costs and the opening of tenders to individuals avoids the risk of a conflict of interest between agents who represent the demand and the agents who are organising the offer. This is intended to prevent a situation under which contracts are signed with agents who are acting simultaneously as controlled and controller, and the risk that they might become instruments useful only for securing public financing.

iii) **Selection of investment projects (public or club assets) consistent with the specifications contained in calls for tenders.** In the end, the projects and competitors that best comply with specifications solicited in the call are rewarded. In Veneto, unlike in other regions, investment projects undertaken directly by the actors who formulate the needs of a district are not permitted and supplier specialisation is favoured instead. The councillor and the entire council are given broad discretion in selecting offers and in the criteria for selecting and accrediting private promoters of the investment.

Source: OECD (2010), *OECD Territorial Reviews: Venice, Italy 2010*, OECD Publishing, Paris, *http://dx.doi.org/ 10.1787/9789264083523-en*.

Universities could become more crucial partners in the regional innovation system in Gauteng. Collaboration between firms and universities could promote commercial applications of basic and semi-applied research projects in key regional value chains and industries. Conversely, improved linkages between universities and industry in Gauteng would also generate spin-offs and attract capital for research activities. In the United States, for instance, universities have become key actors in levying research grants. The University of Washington in Seattle, for instance, attracted USD 750 million in 2004, directly stimulating the regional economy as well as providing new intellectual platforms for regional cluster initiatives in the life sciences, IT, biotechnology and other high-tech growth sectors. Universities are already active in Gauteng's Innovation Hub, but there is room for a higher level of involvement, especially in connecting university "technology transfer offices" and business liaison offices. Berlin constitutes a strong reference for a triple-helix model of "Government-Industry-Academia" collaboration for regional innovation.[61]

Developing innovation monitoring in Gauteng

Improved monitoring of innovation performance in Gauteng would provide a clearer indication of the achievements and gaps of Gauteng's regional innovation system. No one institution has the responsibility of monitoring the extent and the efficiency of the region's distribution network in collaboration with the municipalities, provinces and chambers of commerce. Their metrics could be improved through adopting a range of measurements developed, for example, in the European Commission's European Innovation Scorecard (EIS).[62] Such improvements could help monitor supply chain innovation, innovation skills, intellectual property protection, research commercialisation, and the financing of R&D and innovation (Baier et al., 2007). A rigorous regional innovation review could also be launched to acquire a more nuanced understanding of the innovation networks in Gauteng. Such an exercise, and the economic policy decision-making that it seeks to inform, would be enhanced if spatial data were readily available in South Africa at lower scales of analysis, as noted earlier.

Improving public access to innovation indicators in Gauteng is crucial for implementing innovation policy. The region does not have an extensive electronic database on patents that is easily accessible and available to researchers. This could complement data available through the World Intellectual Property Office (WIPO). Only 2004 data collected manually by the HSRC are readily available. The Companies and Intellectual Property Registrations Office (CIPRO) classifies patent applications according to their International Patent Classification (IPC) code, but none of this is publicly accessible. Discussions are under way to release CIPRO data in electronic format, but little progress has been made.

Greening innovation

Environmental challenges in Gauteng are undermining economic growth, reducing its attractiveness to firms and human capital. Air quality, constrained waste management facilities and water quality pose health risks and entail associated costs and inefficiencies. Meanwhile, rising population density, industrial activity (particularly in the metals and mining sector), and increasing emissions from coal-fired energy generation and transport are further exacerbating environmental degradation. However, the convergence of economic and sustainable development policies for regional development create opportunities for green growth. As outlined in Gauteng's "Developmental Green Economy Strategy" report (Box 2.14), decoupling economic growth from environmental impact and natural resource consumption can result in new job growth, while improving environmental quality of life. This could yield further market opportunities in waste management, particularly with respect to recycling and landfill energy generation, as well as distributed and concentrated solar power generation. This section will first review work done towards the Gauteng "Green Strategy", then analyse potential growth opportunities related to waste-management operations, solar water heating, concentrated solar power and electricity pricing mechanisms. The section will close with a review of the Sustainable Human Settlements concept in Johannesburg.

Box 2.14. **Strategy for a Developmental Green Economy for Gauteng**

The "Strategy for a Developmental Green Economy" for Gauteng provides a vision for the region to integrate economic growth and job creation with environmental sustainability. Led by the regional Department of Economic Development (DED), the strategy repositions sectors including transport, waste management, energy generation and food production by incorporating sustainable technology, processes and co-ordination among public agencies, the private sector and civil society stakeholders. Key elements of the strategy include:

- **Distributed solar power.** The strategy considers distributed solar power through solar water heating installation and estimates that participation by 95% of middle to high-income households and 50% low-income households by 2025 could result in approximately 6 700 new jobs and roughly 2 million metric tons of averted carbon emissions. However, these participation targets may be fairly ambitious.
- **Energy efficiency targets.** The strategy projects that increasing energy efficiency in the industrial, residential, commercial and transport sectors by 15-20% could create between 7 500 to 10 400 jobs, while adding between ZAR 450 -640 million in annual salary revenues for 2025.
- **Water and sanitation programmes.** Programmes to improve water demand management, wastewater treatment and co-operation among municipalities and regional agencies include leakage control and household plumbing upgrades in low-income communities.
- **Waste management.** The strategy identifies a combination of waste management initiatives that could generate approximately 19 400 jobs while reducing waste to landfill by up to 60%, including composting, mandatory recycling, waste minimisation clubs, waste-to-energy thermoelectric power plants, and converting landfills into multi-use areas, such as eco-parks.
- **Food security.** The strategy focuses on promoting urban agriculture, value chain regionalisation, crop diversification and land reform to improve market access and reduce scarcity and malnutrition, reliance on imports, and mono-crop production.

Successful implementation of these policies will be determined by the degree to which economic growth is decoupled from natural resource consumption and environmental impact.

Source: Spencer, F. et al. (2010), "A Strategy for a Developmental Green Economy for Gauteng", report prepared for the Gauteng Province Department of Economic Development, *www.gcro.ac.za/sites/default/files/reports/a_developmental_green_economy_for_gauteng_final.pdf*.

Efforts under way in the Gauteng city-region to separate recyclable material at the waste-source should be fully supported and replicated, to enable job creation and new market opportunities while reducing landfill accumulation. As indicated in Chapter 1, recycling and other non-landfill disposal methods could make up a much greater share of the waste stream in Gauteng, and provide job opportunities and social mobility for the urban poor (*Sustainable Human Settlements*). For example, the PET Plastic Recycling (PETCO) initiative in Gauteng recycled approximately 22% of PET (polyethelene terephthalate) beverage bottle sales from 2000-07 while resulting in approximately 10 000 informal jobs (Gauteng Department of Agriculture, Conservation, Environment and Land Affairs, 2008). Implementing mandatory recycling efforts could further create jobs while reducing waste. However, formalising informal workers may become a new issue of contention (Olivier and Cooke, 2009). In the Waterval region of northern Johannesburg, the city has initiated a major sort-and-recycle pilot project, using

independent small-scale contractors. Waste is sorted into papers/cardboard and separately plastic, tin, glass, etc. then put out with the weekly refuse bins; and the separate outputs are collected by small-scale entrepreneurs as well as individuals who use recycling for their work. The pilot is still under way, and it is too early to determine the effectiveness of this programme, although anecdotal evidence points to a reduction of the waste stream.

Traditional landfills, where the vast majority of waste in Gauteng ends up, represent a missed opportunity to dispose of waste through waste-to-energy processing. Generating electricity through thermoelectric power plants that capture and burn methane can create jobs, reduce greenhouse gas emissions and diversify energy sources. An example of one successful landfill methane capture project is the Bandeirantes Landfill Gas to Energy Project in São Paulo, Brazil, a private-public partnership and clean development mechanism (CDM) project. Since operations began in 2004, the project has successfully managed to reduce landfill emissions by nearly 80 000 tonnes of CO_2 equivalent (UNFCCC, 2005; cited in OECD, 2010a). In a similar project, the landfill methane recovery plant financed through a public-private partnership in Monterrey, Mexico, converts enough landfill gas to energy to power the city's light rail system by day and the city's streetlights by night (OECD, 2008b). Though waste-to-energy projects have been considered in the "Strategy for a Developmental Green Economy" for Gauteng, greater importance could be placed on financing mechanisms to implement landfill methane-to-electricity projects in the short- to medium-term.

Solar power in Gauteng is an underutilised opportunity that can promote job growth while reinforcing energy security and green development. Whereas coal-based energy sources provide most of the region's electricity, opportunities exist with renewable energy technology, particularly with respect to solar. Solar water heaters and concentrated solar power generation offer two complementary systems that reduce environmental impact while supporting economic output, in the form of job growth, reduced energy costs and reduced coal-based electricity demand. In the solar water heater market, an installation of 10% of households over three years in Gauteng could translate into approximately 215 000 solar water heaters (Ward and Schäffler, 2008). The Solar Water Advancement Programme in Cape Town was established to meet the city's goal of equipping 10% all households and publicly owned buildings with solar water heaters by the end of 2010. Though financial challenges represented serious constraints, such obstacles were alleviated through a CDM project. Gauteng would do well to consider similar opportunities if faced with similar financing concerns. More aggressive targets for household penetration of solar water heating by 2025 could potentially result in the creation of just under 7 000 new jobs and roughly over 2 million metric tons of averted carbon emissions (Spencer et al., 2010). Concentrated solar power affords Gauteng additional energy security, and has the potential for new job creation if certain conditions are met. Though neighbouring provinces are better suited to host large solar facilities, Gauteng may benefit from domestic solar manufacturing facilities and industry supply chain. If concentrated solar power could contribute 16% of Gauteng's electricity, it is estimated that as many as 4 000 new jobs, including 900 in construction and another 1 000 at the concentrated solar-powered plants, could result.

Policy instruments targeting electricity prices may contribute to the emerging "Gauteng Green Strategy" by alleviating constraints in the renewable energy sector. In particular, placing a price on carbon, through a carbon tax or cap-and-trade system, will help energy generated from renewable sources achieve grid parity (OECD, 2010a). Policy instruments such as preferential feed-in tariffs have had some success in Germany, Spain, and the United States, among other countries. This policy has recently been considered in

South Africa by the National Energy Regulator of South Africa (NERSA) and should be included in the Gauteng Green Strategy given its implications for solar-based distributed energy. Other methods, such as a forward auction-based capacity market, as developed in Brazil and in certain regions of the United States, could enable the purchasing and thereby the funding of capacity currently in development (Gottstein and Schwartz, 2010). Low electricity prices reflect the large coal reserves used for power generation, and therefore undermine the investment incentives to solar, wind, and waste-to-energy related projects. To better enable solar energy market penetration, Gauteng could consider policy mechanisms that influence electricity prices.

Land use and quality of the built environment are important factors in environmental quality of life and economic attractiveness. The City of Johannesburg has recognised this by incorporating the concept of Sustainable Human Settlements (SHS) Indices into its planning decision-making process. The SHS concept, which originally flowed from the national Department of Housing's Breaking New Ground (BNG) development policy (Box 2.15) aligns economic growth with spatial, social and environmental sustainability. The key elements are optimisation of spatial integration and urban form, mixed-housing development, and mitigating environmental impact, to enable the urban poor to participate in balanced and shared economic growth. In Johannesburg, SHS principles are being incorporated into urban planning and construction codes on a project-by-project basis. The SHS shares some similarities with OECD initiatives on sustainable development. Similar initiatives can be found in Japan's vision for "compact cities", an effort to curtail urban sprawl. Portland has also begun systematic implementation through multi-level governance, particularly in co-ordinating funding mechanisms with energy-efficient building codes, which are reinforced at the state level. These examples focus on building efficiency, but the SHS also focuses on environmental quality of life and security concerns. Johannesburg's programme offers a model that could be expanded to other parts of Gauteng. Applying these principles at the regional level would help to reinforce social integration and reduce urban fragmentation between the region's city centres and outlying areas. Attention should be paid to elements of the SHS that enhance quality of life and reduce environmental pressures.

Building mega-infrastructure for a mega-region

The Gauteng Provincial Government has introduced some innovative policies to address significant funding gaps in providing infrastructure. An infrastructure fund to attract private investment has been established. The province has also entered into an agreement with the Development Bank of Southern Africa (DBSA), to act as lead fund arranger for investment in strategic infrastructure that targets renewable energy, ICT, roads, rail and tourism. Investment decisions will be guided by the 2010 Gauteng Spatial Development Framework (GSDF), which identifies 25 large-scale multi-billion rand infrastructure investment and growth nodes in areas outside the economic core of the province.

Box 2.15. **The Johannesburg Sustainable Human Settlements Indices**

The plan sets out to address broadly occurring dysfunctional development in Johannesburg, including spatial fragmentation and urban sprawl, mono-functional land use and low infrastructure provisioning. The aim is to integrate excluded and disadvantaged groups in the following ways:

- **Pro-active absorption of the poor:** urban poverty is to be absorbed into social and economic development. The provision of basic livelihood and opportunities, capacity building for economic participation, and negotiation of costs of living will provide access to upward mobility and inclusion.
- **Balanced and shared economic growth:** the plan aims to consider carefully the question of economic growth. Johannesburg's resilience against adverse economic shock can be increased by diversification amongst a variety of sectors, driven by both strong domestic investment and international demand. Promoting diverse labour participation and shared benefits are integral to this aim.
- **Facilitating social mobility:** obstacles that prevent access to jobs and the transition from poverty to middle-income participation should be removed, to facilitate social inclusion.
- **Settlement restructuring:** bringing potential workers closer to jobs by accelerating spatial reorganisation and other alterations to urban form will also help balance economic growth and absorb the urban poor.

Monitoring progress on spatial integration, mixed housing and environmental sustainability will be measured according to underlying criteria in residential and non-residential zones. Criteria such as access to public transport, security and ratio of greenfield to brownfield development will be considered. Other criteria that relate to environmental quality of life, such as sidewalk placement and aesthetics (trees and vegetation) will also be considered. Measuring these criteria will help to identify progress toward sustainable human settlements goals.

Source: City of Johannesburg (2010), "Sustainable Human Settlements Goals".

Improved highway maintenance is called for to reduce high logistical costs that create trade bottlenecks and undermine the competitiveness of the land-locked region. Nationally, logistics costs relative to GDP stood at ZAR 339 billion, or 14.7% of GDP in 2008. Secondary roads are in particular need of maintenance in Gauteng, and the highway from Newcastle to Gauteng (N11 and N17) is in critical need of maintenance. A typical truck travelling from Newcastle to Gauteng (300 kilometres) has on average maintenance and repair costs of ZAR 627 per trip, which is more than twice as high as the rate an identical truck would pay to travel on the N3 between Gauteng and eThekwini (300 kilometres, ZAR 270 per trip). Assuming that a truck makes 100 round-trips a year, the total maintenance and repair costs of the Newcastle to Gauteng truck could potentially amount to ZAR 125 400 per year (Council for Scientific and Industrial Research, 2010).

Though Gautrain will help mitigate the congestion on the Johannesburg-Tshwane corridor, it cannot substitute for a better road network. Gautrain alone will not be able to handle the travel demand between these two cities. High-speed trains can typically carry a maximum of 1 000 passengers per trip, and the headway between each running train is generally 10 minutes. Approximately 6 000 passengers could travel every hour in each direction along the Gautrain line, capping the number of passengers on the system during

an hour of peak commuting at 12 000. It is not clear how Gautrain's fares will compare with the cost of driving, which can be shared with fellow passengers. The high-speed train may not mitigate road congestion of N1 or N14 routes of Gauteng unless it drastically reduces travel time. It also remains to be seen how the Gautrain high-speed rail system will be linked to feeder lines and bus rapid transit networks being developed in Johannesburg and Tshwane. Such links could provide a seamless transit experience and substantially reduce automobile commuting. One option is to develop policies that connect Gautrain's station to bus lines. Thought should also be given to connecting the underutilised railway network, which has 55 train stations in Johannesburg alone.

Though the Gauteng Provincial Government and the three metropolitan governments have all developed proposals and projects to introduce "municipal broadband", construction has not yet begun on the infrastructure to permit high levels of Internet access, and this has limited e-commerce. The City of Johannesburg has commissioned Ericsson to build, operate and maintain a city-wide broadband network, while the Gauteng Provincial Government is developing a multi-billion rand G-Link broadband infrastructure investment (Gauteng City-Region Observatory, 2010a). However, these fledgling initiatives do not yet provide information infrastructure for small firms and households. These initiatives should be well planned, with effective project management. In theory, a greater availability of infrastructure at more affordable prices should catalyse initiatives for content creation to deliver relevant content to larger and more diverse audiences and should increase online banking and e-commerce.

Adoption of intelligent transport systems (ITS) would increase the efficiency of the transport network. ITS would be able to speed up traffic flow on current transport facilities and ensure a greater degree of safety. Bus information services (BIS) are particularly needed in the area and could provide helpful information on waiting times for incoming buses, reducing passengers' waiting times. The BIS is widely used throughout OECD metropolitan areas, including Portland and Amsterdam, and can be distributed easily online and on mobile phones.

Improving demand management measures in transport policy

Despite the focus on enhancing public transport to encourage modal shift and tackle congestion in Gauteng, not enough attention has been paid on accompanying demand management measures, which are indispensable for the efficacy of the supply enhancement initiatives. Though there is some recognition of the need in the City of Johannesburg's Integrated Transport Strategy and the Gauteng Strategic Agenda (Gauteng Department of Public Transport, Roads and Works, 2006), neither Gautrain nor the Rea Vaya BRT will attain the full reach of their objectives if they are not accompanied by policy mechanisms, including pricing, systematic and restrictive paid parking, that will coax individual car users out of their vehicles. As with many governments in OECD member countries, South Africa still places too much reliance on the supply-side measures of infrastructure and service provision, and too little on demand management, regulation, information and pricing. Moreover, the value of more cost-effective transport demand management is enhanced at an earlier stage of motorisation.

Effective urban public transport operations require an appropriate combination of service improvements, better management of the road network, improved information for users, appropriate fare structures and stronger price signals to car users. Benefits from promotion of non-motorised means of travel (cycling and walking) can only be realised as

integral parts of the policy package. They can be linked, for example, with improvements to public transport and the road network. Congestion charging in London is generally seen to have worked well precisely because it was combined with improvements to management of the road network and substantial enhancements to bus service. Broad congestion management requires different levels of integration (OECD and European Conference of Ministers of Transport, 2007):

- operational integration of different services and information, e.g. in public transport (including fare structures) and traffic management;
- strategic integration between instruments affecting different modes and between those involving infrastructure, management, information and pricing;
- policy integration between transport and land use;
- organisational integration of government bodies and agencies with different responsibilities for transport.

Box 2.16. **Summary of economic development recommendations for the Gauteng city-region**

Confronting spatial inequality

- **Increase the supply of modest-cost housing:** facilitate the construction of more affordable homes by offering ready-made plans to developers that would meet city regulations; support a larger non-profit housing development community by reducing the up-front costs of affordable housing development appraisals and by financing the costs of environmental impact assessments and other required pre-development studies; encourage homebuilders and building materials manufacturers to provide home credit for the bottom of the income pyramid.
- **Reform targeting of public housing:** consider subsidies for low-income residents to rent in moderate-income neighbourhoods, as is common throughout OECD member countries.
- **Improve mobility by enhanced transport and growth management:** develop mechanisms to encourage drivers to switch to public transport (especially Gautrain and Rea Vaya); support broader experimentation with transit-oriented development in light of its potential to raise density and land values around transport hubs; institute a unified fare system; encourage multi-story houses (apartments) as a tool of densification.

Confronting economic inequality

- **Enhance education and apprenticeship programmes:** upgrade apprenticeship training; improve the relevance of training in public institutions, and spearhead a province-level campaign to attract and retain teachers, perhaps by offering wage premiums and loyalty bonuses; expand co-operation with private sector-led apprenticeships.
- **Raise employment through improved labour market policies:** consider financing a pilot project to introduce cash transfers to create income-generating activity, provide support for efforts under way to achieve better "job matching".

Box 2.16. **Summary of economic development recommendations for the Gauteng city-region** *(cont'd)*

- **Provide support to the working poor in the informal economy:** better tailor labour market interventions to a labour force that is mobile between the informal and formal categories of employment.
- **Integrate immigrants into the Gauteng city-region economy:** conduct a robust evaluation of immigrant settlement and employment patterns in Gauteng and encourage professional associations to expedite immigrant integration.
- **Expand labour market security for all workers:** approve additional measures to regulate the spread of labour broking in the Gauteng city-region, ensure better monitoring and reporting to improve occupational health and safety in and around the workplace.

Expanding economic opportunity

- **Position economic development policy in a city-region framework.**
- **Improve productivity growth:** expand tertiary and vocational education; enhance technological capacity of firms.
- **"Green" Gauteng's growth:** place GCR in the pole position to create new sectors in renewable energy and clean tech (and clean production processes) within Africa and beyond; expand the level of solar energy provision.
- **Expand innovation:** expand experimentation with clusters in Gauteng, which are of limited number and confined to the manufacturing sector; build an extensive publicly accessible electronic database on patents; delegate the responsibility of monitoring the progress of the regional innovation system to a government institution.
- **Build mega-infrastructure for a mega-region:** upgrade transport facilities by applying intelligent transport systems to increase efficiency of the network; expand municipal broadband; improve inter-modal connections across public and private transport providers; address current and future bulk infrastructure needs.

Notes

1. Access to flush toilets increased from 82.9% to 84% between 2001 and 2009. Likewise, access to inside piped water increased from 51.8% to 59% between 2001 and 2008 (IHS Global Insight, 2009; cited in Gauteng Provincial Treasury, 2010). Access to electricity for cooking, heating and lighting grew by 12.2%, 9.9% and 3.5% from 2001 to 2007, respectively (Statistics South Africa, 2001, 2008, cited in Gauteng Provincial Treasury, 2009). In terms of skills, while 26% of workers were qualified as "skilled" in 2001, by 2008 this had grown to 33% (Quantec Research, 2008, cited in Gauteng Provincial Government, SERO, 2009).

2. An elimination was encouraged by the Accelerated and Shared Growth Initiative for South Africa (AsgiSA). The South African Government also uses the term "second" as a synonym for informal.

3. Indeed, using the current output-employment elasticity for Gauteng, it was found that unemployment rates would rise to 45% by 2025 (Bhorat, 2009).

4. Available at *www.info.gov.za/view/DownloadFileAction?id=135748*.

5. These include the Accelerated and Shared Growth Initiative for South Africa (AsgiSA), the Presidential Apex Priorities, the National Industrial Policy Framework (NIPF), and more recently the Industrial Policy Action Plan (IPAP), the National Skills Development Strategy (NSDS), the Joint Initiative for Priority Skills Acquisition (JIPSA), the Microeconomic Reform Strategy (MRS), and Broad-Based Black Economic Empowerment (BBBEE).

6. First, it undertook a substantial review of all special-purpose agencies that are attached to the provincial Department of Economic Development. Secondly, it commissioned a study of the green economy and its potential applicability in the Gauteng Province. Thirdly, it worked towards the drafting of the GEGDS, which would incorporate the recommendations of the former two studies and explore viable growth paths for the regional economy that would be more labour-absorptive and environmentally efficient. The GEGDS was adopted by the Gauteng Executive in May 2010. As indicated in the previous section, the GEGDS should be read alongside the Gauteng Spatial Development Framework approved in February 2011.

7. "The GSDF is a city-region-wide framework that attempts to create a manageable and sustainable Gauteng conurbation across a very long time horizon. This is done by ensuring that urbanisation takes place in an appropriate manner, taking into account the various constraints faced by communities and administrative regions, as well as the peculiar advantages and disadvantages of each area. Productive investments by the public sector must be concentrated in the cities, as the latter are the drivers for growth and job creation" (Gauteng Provincial Government, 2010a).

8. Green Economy Strategy (DED), GDE Strategic Plan (GDE), Infrastructure Investment Strategy (DED), Local Economic Development Strategy (DED), Gauteng Integrated Energy Strategy (GIES) (DLGH), Gauteng Innovation Strategy (DED), Gauteng Industrial Policy (DED), DED Business Environment Assessment (DED),

Co-operatives Strategy (DED), Social Development Strategy (DHSD), SMME Intervention Strategy (DED), BBBEE Strategy (DED), Rural Development Strategy (DARD), Preferential Procurement Policy Framework Agreement (DED), Policy to Protect Rural Agricultural Land (DARD), Creative Economy Strategy (DSARC), Gauteng Transport Master Plan (GDRT), Gauteng Freight Strategy (GDPTRW), Public Transport Integration Plan (GDPTRW), and the Social Crime Prevention Conceptual Framework (DHSD).

9. The City of Johannesburg, for example, aims to boost local investment and encourage business through urban development zones, a national project to revitalise cities' central business districts (CBDs). This allows for a tax incentive for developers who invest in upgrading existing property or create new projects.

10. This goal is established in Outcome 8, under Output 1, "Accelerated delivery of housing opportunities", in line with the Delivery Agreement that emanated from the Medium-Term Strategic Framework (2009-14). The Gauteng Department of Local Government and Housing builds rental units itself, but the Gauteng Partnership works with the private sector to attract developers into the affordable rental market. See *www.gpf.org.za* for more details.

11. In this respect, an important development is the introduction of a new Urban Settlements Development Grant, together with accreditation of larger municipalities to receive national housing subsidy funding directly, rather than via provincial housing departments. In the Gauteng city-region, Tshwane, Ekurhuleni and Johannesburg have been accredited, and are therefore eligible to receive the new grant, subject to the submission of an acceptable Built Environment Performance Plan. This provides an important opportunity for the metropolitan municipalities in the city-region to work together and with the Gauteng Provincial Government to plan new settlement typologies and associated infrastructure requirements.

12. Housing statisticians have not achieved consensus on income affordability. In the United States, for instance, Gan and Hill (2009) discuss three different indexes produced by the National Association of Realtors (NAR), the United States Department of Housing and Urban Development (HUD) and the National Association of Home Builders (NAHB). They write, the "NAR index measures the ratio of 25% of median monthly income to the monthly repayments on a fixed-rate mortgage on the median house at current interest rates. The HUD index measures the ratio of median family income to the income required to qualify for a conventional mortgage on the median valued house sold. The NAHB index measures the fraction of dwellings sold that could be purchased by the median household with 28% of household income." Gan and Hill develop new statistical tools to measure purchase and repayment affordability, which the "median multiple" does not capture.

13. Demographia (2006) acknowledges this shortcoming of its methodology:

[C]aution should be employed in comparing median multiples between countries, due to substantial differences in average house and lot size….For example, according to national reporting agencies, the average new house constructed in Australia and the United States is approximately 2 200 square feet (over 200 square meters), including both detached houses and multiple units. New house sizes are nearly as large in New Zealand (1 900 square feet or 175 square meters), while new detached houses average 1 900 square feet (175 square meters) in Canada. However, new average house sizes are less than one-half that size in United Kingdom, (815 square feet or 76 square meters)….Moreover, new UK houses are the smallest in the former EU-15, while new Irish houses rank 9th in size among the 15 nations. Houses in Australia,

Canada, New Zealand and the United States have increased substantially in size in recent decades….New house sizes have dropped more than 30% in the United Kingdom since 1920…. In fact, average house lots are much larger in the United States (and Australia, Canada and New Zealand) than in the United Kingdom. In the United States, new detached houses are built at 2.7 per acre (6.6 per hectare). In Australia, new detached houses are being built at 5.5 per acre (13.3 per hectare). By comparison, in the United Kingdom, new houses were built at an average of 16 per acre (40 per hectare) in 2005.

14. One notable exception is the Housing+Transportation Affordability Index, which takes transport costs into account. It was applied in 51 metro areas in the United States after being jointly developed by the Center for Neighborhood Technology and the Center for Transit Oriented Development (CTOD) (Center for Neighborhood Technology, 2008).

15. Work conducted by DiPasquale and Wheaton (1994) provides an analytical framework for such a study, emphasising the multiple factors that influence housing prices.

16. For example, according to the "Moderately Priced Dwelling Unit Ordinance" of Montgomery County, outside Washington, D.C., developers of more than 50 detached residential units are required to set aside 12.5-15% of all units over 20 years in return for density bonuses of 20% to upwards of 22% (Nelson, 2003).

17. The basis of the national approach to inclusionary housing prescription is based on housing units and the following variables: *i)* inclusionary percentage requirement ranges between 10% and 30% as per the discretion of the municipality; *ii)* the requirement translates to an additional number of units over and above the number of units applied for by the developer; *iii)* municipalities may formulate their own inclusionary housing plans and percentage requirements may vary from area to area or apply across the entire municipal jurisdiction; *iv)* percentages will vary according to the requirements in designated areas; *v)* percentage requirements below 10% require permission from the relevant Housing MEC; *vi)* inclusionary requirements are applicable for rezonings, subdivisions, township establishment applications, sectional title, share block residential developments, and second and third additional units; and *vii)* a threshold of two or more dwelling units (cited in City of Johannesburg, 2009b).

18. The "home equity assurance" programme was first implemented in the Chicago suburb of Oak Park, Illinois, to discourage flight following a racial transition. Essentially, this successful programme enrolls property owners near high-density developments and agrees to pay the difference between the appraised value and the sale value if the home is sold for less. According to Nelson (2003), Oak Park has yet to compensate any property owner under its innovative programme.

19. Another reference in the United States is the Moving to Opportunity for Fair Housing programme sponsored by the United States Department of Housing and Urban Development (HUD), which gives Section 8 housing vouchers to low-income families and gives them counselling and assistance to help them move to low-poverty neighbourhoods with better resources. The pilot study was implemented by public housing authorities in Baltimore, Boston, Chicago, Los Angeles and New York City. See Schroder (2001) and Briggs et al. (2010) for evaluations.

20. The failure to use holistic life-cycle costing is symptomatic of the current approach. Using this type of costing could show how funding transport subsidies for peripheral areas is significantly more expensive in the long term than the higher initial costs of

building housing in well-located higher-density neighbourhoods (Urban Sector Network and Development Works, 2003).

21. It is important to keep in mind that the national budget's allocation for social expenditure is currently on an upward trajectory in the medium term. If the proposed national health insurance system comes into effect over the next few years, that trajectory will incline even more sharply. These two factors will obviously crowd out other categories of national expenditure, especially economic and settlement infrastructure.

22. The most recent data also shows that the current capital-expenditure intensive model imposes a costly operating burden on municipalities that most are simply not able to service adequately.

23. At the moment it is illegal for beneficiaries to trade the public housing that they receive from the government as an entitlement for at least ten years. Given the dire economic circumstances of most beneficiaries, many of them do sell their houses illegally in order to access liquidity for livelihood purposes and then move back to the shack settlement which may be better located and/or cheaper to maintain in terms of social reproduction costs.

24. Sanitation has already moved to Human Settlements. In conjunction with National Treasury, it is promoting the establishment of a new Human Settlements Fund that will bring together four funding streams separate from the current housing subsidies. These are the Municipal Infrastructure Grants for Cities (the six metros) disbursed by the Department of Co-operative Governance; the Neighbourhood Partnership Development Grant under the National Treasury; the Integrated Municipal Transport Grants from the Department of Transport; and the Integrated National Energy Programme under the Department of Energy.

25. The Department of Human Settlements continuously updates and issues regulatory guidelines to guide the expenditure of allocations to provinces for public housing. These are regarded as binding, and if provinces were to explore unique policies of their own, this is likely to be discouraged by the national government, which is invested in maintaining a uniform national approach.

26. See *www.thehda.co.za* for more information.

27. Gauteng's household size (3.3 people per household) was used to convert population to residential density.

28. Cape Town based development fees on a simple calculation of the average rate for each square metre of gross leasable area, or GLA. eThekwini municipality, in addition to connection fees, has experimented with the introduction of increased application fees, based on practices in Hibiscus Coast Municipality, and a general development tax (from 1 June 2004) that focused on two rapidly growing areas of the city. However, "application fees are seldom high enough to cover infrastructure costs, while the introduction of a formal tax is almost certainly procedurally illegal in terms of the Municipal Fiscal Powers and Functions Act 2007" (Savage, 2009).

29. For more on UK neighbourhood statistics, see *www.neighbourhood.statistics.gov.uk*.

30. It might also facilitate moving trained teachers to where they are most needed, which could potentially address the relegation of so much of the majority black population to unemployment, low-paid informal employment, or unskilled manual labour in the formal sector.

31. The provinces do, however, carry out their own audits and send reports to the auditor general, but only in extreme circumstances can national government intervene in the financial affairs of provinces (OECD, 2008a).

32. Under the section "Principles of co-operative government and intergovernmental relations", the Constitution states: "All spheres of government and all organs of state within each sphere must … co-operate with one another in mutual trust and good faith." Similarly, the National Education Policy Act, 1996, article 4(0), stipulates that one of the goals of national policy is "achieving close co-operation between the national and the provincial governments on matters relating to education, including the development of capacity in the departments of education, and the effective management of the national education system" (cited in OECD, 2008b).

33. In essence, the German apprenticeship model is based on the following four principles, "(a) exploit workplaces and community settings as learning environments; (b) link work experience to academic learning; (c) give youth constructively ambiguous roles as simultaneously, workers with real responsibilities and learners; and (d) foster close relationships between youth and adult mentors" (Bailey, 1993, based on Hamilton, 1990). "Dual training" is of crucial importance in Germany and is normally conducted in two places of learning – companies and vocational schools. It normally lasts three years. The aim of training in the dual system is to provide, in a well-ordered training programme, broadly based basic vocational training and the qualifications and competences required to practise an occupation as a skilled worker in a changing world of work. Successful completion of the programme entitles the trainee to practise an occupation as a qualified skilled worker in one of the 346 currently recognised training occupations (Hippach-Schneider, Krause and Woll, 2007).

34. A more detailed description of CIDA City can be found on *www.cida.co.za*.

35. More recently, proponents of a targeted jobs tax credit for the United States claimed their scheme would create 2.8 million net new jobs in 2010 but conceded that four out of five USD would subsidise jobs that would have been created without the subsidy (Bartik and Bishop, 2009).

36. In line with the Gauteng Growth and Development Strategy (GGDS), in 2005 the Gauteng Enterprise Propeller Act was passed in order to promote entrepreneurship and small-, micro- and medium enterprises (SMMEs) in Gauteng. GEP provides financial and non-financial support to SMMEs in Gauteng, including assistance with business plans, tender information and advice, debtor factoring and refinancing of debt. GEP intends to increase the participation of SMMEs in the following growth sectors: smart industries (ICT, pharmaceuticals), trade and services, tourism, agro-processing, manufacturing (steel-related industries) and infrastructure and investment. The development of this entrepreneurship and SMME policy seeks to enable faster economic growth and job creation, fighting poverty and building strong and sustainable communities and developing healthy, skilled and productive people.

37. The Child Support Grant was due to be raised in November 2010 by ZAR 10 to ZAR 250 a month.

38. Usually described as the Taylor Committee, after its chairperson, Vivienne Taylor, it was convened and guided by the Minister of Social Development.

39. In South Africa, the only social insurance scheme is for unemployment. The pension system is a fully funded scheme managed by private pension funds. According to the *Labour Force Survey*, about 75% of workers were covered by a pension scheme or

unemployment insurance in 2007. Public health expenditure is financed out of general taxation. Social assistance is rather developed, notably through a (relatively generous) basic old-age pension, and means-tested child allowances and disability grants (covering respectively 5%, 10.5% and 3% of the population in 2008, from the National Income Dynamics Study). A public works programme is also available for the unemployed (OECD, 2010i).

40. So-called "indigent" programmes have been part of the South African municipal space since the end of apartheid. The bottom line has been promoting access to the basic services for survival, and prepaid services are a crucial part of the overall package. In practice, the services have reached those with accounts, the person responsible for the bills of a particular dwelling; this creates problems in dealing with multiple households in a dwelling.

41. Furthermore, a separate system of grant funding, municipal infrastructure grants (MIG), is provided by the national government to enable municipalities to build and extend bulk infrastructure to ensure that poor households are systematically connected to the network (Bosch et al., 2010).

42. The AsgiSA strategy aimed to eliminate the second economy by integrating informal activities into the formal market. In August 2003, President Thabo Mbeki introduced the idea that in South Africa, a "first economy" and a "second economy" operate side by side. In November that year, in an address to the National Council of Provinces, he stated: "The second economy (or the marginalised economy) is characterised by underdevelopment, contributes little to GDP, contains a big percentage of our population, incorporates the poorest of our rural and urban poor, is structurally disconnected from both the first and the global economy and is incapable of self-generated growth and development" (Devey et al., 2006).

43. Between 1988 and 2003, Bogotá's mayors experimented with nearly every plausible policy for street vendors, including micro-credit, worker retraining, rotating street fairs, co-operatives, relocation, pacts with "reformed" vendors and public debates on informal commerce restrictions (Donovan, 2008).

44. This is essential for workers to avoid what Szerman and Ulyssea (2006) dubbed in Brazil the "informality trap", i.e. a low probability of moving out of informal employment that declines rapidly over time (cited in Jütting and de Laiglesia, 2009).

45. The experimental learnership is based on the development of local co-operation network at the municipal level, involving NGOs and local co-operatives. In addition, it involves co-ordinated identification, by the network, of the skills and qualifications needed to create new business and self-employment. The new business and self-employment activities can obtain development aid services and apply for loans from finance institutions supported by the South African Government (OECD, 2008a).

46. Work experience via "bridge-to-work" programmes facilitated by professional associations, education institutions and not-for-profit organisations could be rolled out in Gauteng. An international example of such a "bridge-to-work" programme is the Career Bridge paid internship programme for internationally qualified professionals, operated by Career Edge Organisation, a national not-for-profit that works with employers across Canada and has provided more than 9 200 paid internships since 1996 (OECD, 2010f).

47. See *www.integrationindex.eu* for more information.

48. The Constitutional Court plays a critical role in upholding socio-economic rights, including the right to fair labour practices (section 23(1)). The Constitutional Court has extended the meaning of worker to include those in work "akin to an employment relationship" (South African National Defence Union *vs.* Minister of Defence and Another, 1999; Cheadle, 2006). Any public policy at any level of government can be referred to the Constitutional Court if an individual or interest group feels it contravenes an article in the Constitution. This offers a more detailed framework for social and economic rights than almost any other Constitution in the world. In short, unlike many parts of the world, South Africa and its provinces are bound to respect the constraints and dictates of a rights-based Constitution.

49. Its Johannesburg headquarters have hosted numerous discussions of sensitive issues, and in general it has served the country well. It is actually a multi-partite body in which all four interest groups – called Government, Business, Labour and the Community – are explicitly regarded as equals. At this crucial juncture, it is perhaps time to take stock of NEDLAC's role, since other governance structures have been established that may overlap or even bypass NEDLAC.

50. As of 2010, seven members of the presidential Cabinet were former union leaders.

51. See CCMA, Review of Operations 1 April 2009 to 31 March 2010, CCMA, Johannesburg.

52. Meanwhile, the Tshwane CCMA office is one of the most efficient in the country.

53. This is shown by research by the Development Policy Research Unit at the University of Cape Town.

54. Proponents of public works around the world trumpet the number of jobs supposedly created and the useful work done. India's National Rural Employment Guarantee Scheme, the world's biggest public works programme, launched in 2006, claims to have provided some employment to more than 50 million households to undertake nearly 4.3 million public works, about half of which were for water conservation (UNCTAD, 2010: 154). Yet there is relatively little discussion of alternatives, in India or elsewhere, that might achieve the same objectives without what even advocates of public works recognise as their major drawbacks (for a brief review of international experience, see United Nations, 2007).

55. A worker in a non-profit organisation must receive the equivalent of a minimum EPWP stipend of about ZAR 1 000 a month.

56. A number of new mechanisms for public funding of R&D have been created. Among these, the Technology and Human Resources for Industry Programme (THRIP) has effectively integrated the training of researchers into industry-university co-operation in R&D. The Human Sciences Research Council (HSRC) has played a leading role in this, in particular creating the Centre for Science, Technology and Innovation Indicators (CeSTII) to undertake basic R&D and innovation surveys and to build analytical work on the results.

57. The Innovation Hub received ZAR 12 687 784 in government grants in FY2010, according to the Innovation Hub *2009-2010 Digital Annual Report*.

58. In order to recognise that society plays a major role in the innovation process and all the other forms of innovation, the "Gauteng Innovation Strategy" draft document proposes an expanded definition of the Regional Innovation System as follows:

The Gauteng Regional Innovation System (RIS) is the entire system of innovating agents and entities, along with their end-users, which together are responsible for the development, production, and use of new knowledge which is both socially and economically useful. This system will provide the framework within which the provincial government is able to catalyse, support and facilitate the innovation process, through policy and targeted interventions.

59. Within that spectrum, it supported and facilitated a range of technology-related activities spanning the industry's diverse technological structure. At one level, for instance, it was associated with a project to develop applications of the Council for Scientific and Industrial Research's world-leading technology for the production of lightweight die-cast components. At another, through the Tirisano Programme, it achieved considerable success with cluster-centred initiatives to upgrade basic skills, technical efficiency and lean manufacturing practice in small firms located in the lowest and least sophisticated tiers of the supply chain structure (OECD, 2007).

60. In this programme, the regional government collects two documents for each district: *i)* a three-year programme of the district, which outlines the long-term objectives to be achieved every three years; and *ii)* a list of annual projects of each district that aligns with targets of the district's three-year plan. The regional evaluators then analyse the coherence between annual projects and the district's constitution and validate that the district has received certification from a local chamber of commerce. If these conditions are met, the regional government then ranks each project on the basis of the call's specifications and other criteria for funding distribution. The regional government then issues calls for project financing, which specify the private or public agents admitted to participate in regional financing (OECD, 2010g).

61. The *Technische Universität Berlin* (TUB) was the first university in Germany to set up a business incubator when it founded the "Berlin Centre for Innovations and Start-ups" in 1983. In 2007, it sponsored a start-up workshop (*Gründerwerkstatt*), that offered facilities and advice for 13 start-ups, along with a services for customised business consulting, including technology scouting and venture capital. A recent case study found that the start-ups it had helped launch and the companies that its graduates founded now account for more than 11 000 mostly highly qualified workplaces in Berlin (Schreiterer and Ulbricht, 2009).

62. See *www.proinno-europe.eu/page/2-introduction* for a list of innovation metrics used.

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Chapter 3
Reforming city-region governance in Gauteng

This chapter analyses inter-governmental collaboration and its potential to advance a cross-cutting regional approach for the Gauteng city-region. Given the persistent challenges of aligning functions across spheres of government, the chapter argues that major policy arenas – public transport, environment and land use, and economic development – could be more effectively balanced through a "territorial" approach, in which various levels of the state work together to maximise economic competitiveness. After reviewing the main financing and planning tools of different levels of government, a section on inter-governmental co-ordination highlights gaps across and between different national and sub-national levels. The chapter recommends a three-pronged city-region governance strategy, consisting of: i) *harnessing financial tools to expand infrastructure and economic opportunity across the city-region;* ii) *embedding the city-region concept into metropolitan transport and environmental policy; and* iii) *strengthening citizen engagement. A multi-scalar approach is applied for policy analysis, encompassing the national level (South African National Performance Management System), the provincial scale (the Gauteng Provincial Government's Employment, Growth and Development Strategy, GEGDS), the municipal level (integrated development plans, IDPs), and the neighbourhood level (ward-based committees).*

The debate on city-region governance in Gauteng is occurring at a critical moment. After the dramatic post-apartheid transformation, local government responded to calls for "one city, one tax base", and local government was expected to rise to the task of nation-building, both in service delivery and participatory governance. Few international precedents exist for such rapid institutional change. Local governments were called upon to administer larger jurisdictions, deracialise public service provision, and institute democratic, non-racial elections.[1] The aim of this progressive experiment was to creatively combine strong representative and participatory systems of governance with a strong focus on decentralised institutions. Today "[m]any of the burning global policy questions about how to achieve local political and economic inclusion within a broad sustainability paradigm can be explored fruitfully through the South African experiment" (Pieterse et al., 2008). Given the significance of the Gauteng city-region for the country and Africa as a whole, it is worth exploring the quality and effectiveness of the institutions being put into place as the country consolidates its democratic culture.

However, as shown in the previous chapters, this dramatic government reform left many serious problems unresolved, including housing deficits, unemployment, inadequate public transport and a growing spatial mismatch. The Gauteng city-region faces these challenges in a context of high in-migration, increased poverty and pressure to improve its global competitiveness and foster more inclusive economic development. There is clear evidence that governments in Gauteng have proactively designed programmes to combat these issues either in collaboration with or without national government support. The government's ability to resolve these issues is made all the more difficult by an entrenched legacy of racial inequality, ecological fragility and a volatile political environment. Further second-generation governance reforms are needed to consolidate what has been achieved and to respond to emerging obstacles.

Intergovernmental collaboration is an imperative as government units in South Africa approach these issues. South Africa's 1996 Constitution invoked a system that requires all three spheres of government to play a role – hopefully complementary – in most of the core functions pertaining to urban and regional development. Furthermore, the planning system allows for bottom-up priority-setting, but within nationally determined higher order policy priorities. These imperatives are often challenged by contradictory trajectories of departments, agencies and individuals in different spheres of government. Consequently, it becomes very difficult to align and synchronise government plans and programmes across the three levels to achieve supposed shared outcomes.

This chapter focuses on intergovernmental collaboration and its potential to advance a cross-cutting regional approach for the Gauteng city-region. This chapter localises the concern of the National Spatial Development Perspective (2006) "to bring about synergy and complementarities in terms of the spatial effects of government action, with a view to maximising the overall social and economic returns on government development spending". The post-apartheid reform created a sub-national institutional framework, but challenges remain over the alignment of functions across spheres of government. The current sectoral focus of major policy arenas, such as public transport, environment and land use, and economic development could be more effectively balanced through a ''territorial" approach, in which various levels of the state work together to maximise economic competitiveness. Policies and funding regimes for spatial planning are governed by several different national ministries whose objectives sometimes conflict. The subsidisation of public transport by the Department of Transport, for example, is at odds with the Department of Housing's funding systems, whose large-scale housing projects for the disadvantaged on cheap, remote land force more people into long

commutes from areas outside the public transit grid. This results in contradictory public policies that ultimately compromise Gauteng's global competitiveness and social inclusivity. After reviewing the main financing and planning tools of different levels of government, the section on intergovernmental co-ordination (Section 3.1) highlights:

- inter-departmental co-ordination gaps at the national level and appropriate recommendations for enhanced co-operation, including performance indicators systems;
- vertical co-ordination gaps between the national government and sub-national levels and the potential of delivery agreements at the metropolitan scale; and
- inter-municipal co-ordination gaps and the promise of a city-region approach to transport, environmental monitoring and climate change.

Additional governance tools, if administered correctly, can be employed to confront the three main economic challenges presented earlier in this Review and help achieve "second-generation" reforms. The three pillars of a city-region governance strategy, therefore consist of the following:

- Harnessing financial tools to expand infrastructure and economic opportunity: the post-apartheid package of reform created a sub-national institutional framework with inadequate financial tools. Funding for urban infrastructure projects that would benefit economic development in Gauteng is limited. Recommendations include the introduction of "smart financing" mechanisms that support revenue generation and densification; the establishment of an "infrastructure barometer" to develop a fine-grained and independent understanding of the Gauteng city-region's network infrastructure systems; and a reform of the intergovernmental grant system to provide additional public funding for infrastructure development.
- Embedding the city-region concept in metropolitan transport and environmental policy: metropolitan co-ordination is essential in the Gauteng city-region to ensure that sectoral policies are coherent or at least not contradictory in a functional metropolitan area that spills over multiple jurisdictions. Advancing the city-region vision will require: *i)* political commitment and consensus behind the notion of a metropolitan approach to policy; and *ii)* new forms of "light" co-operation, such as associations, strategic planning partnerships or the elaboration of policy platforms. Policy makers could target two critical areas to make this a more practical reality: *i)* metropolitan transport; and *ii)* environmental policy making. Specific recommendations include ensuring inter-operability between all public transit fare systems in the city-region, enlarging inter-municipal co-operation on waste collection and disposal, and strengthening metropolitan co-operation in environmental data collection and management.
- Strengthening participatory governance across the Gauteng city-region: this section addresses why and how private sector and civil society groups are needed to tackle the scale of challenges that the Gauteng city-region currently faces. It explores the underlying political capacity of the city-region, focusing on the participation of citizens and civil society groups in policy making, given the new social, legal, economic and institutional frameworks surrounding post-apartheid citizen engagement. The role of citizen participation in the **integrated development plans** (IDPs) is assessed, and recommendations are given to support

the revision of the ward-based committee structure. The analysis is premised on the assumption that good governance depends on an active citizenry to make representative and participatory democratic institutions work well. Such civic pressure is essential for effective accountability, which is a stronger guarantor of state efficacy.

3.1. Streamlining intergovernmental relationships

Decentralisation and the evolution of local governance, 1994-2011

Apart from the collapse of apartheid, the functional expansion of local government authority has arguably been the most significant institutional change in South African society in the past generation. There has been a progressive shift in the scale and scope of local government authority in metropolitan areas. These reforms endowed South Africa a strong central government and a well-articulated structure of interdependent but autonomous "spheres" of sub-national governance. The constitutional principles and political accords of the 1996 Constitution enshrined these principles, creating a unitary, sovereign democratic state elected by proportional representation, with national, provincial and local levels of government. The *bantustans*, apartheid-era homeland governments, were abolished, along with the four provinces and existing racialised agencies, such as the Black Local Authorities (BLAs).[2] In their place, a Delimitation Commission drew up the boundaries for nine new provinces, using the nine economic regions proposed by the Development Bank of South Africa as a point of departure (Spitz, 2000). This was accompanied by rapid reform of parastatals (agencies wholly or partly owned by the national government), with no less than 500 acts passed between 1994 and 1999.

During the post-apartheid transition, South Africa established an ambitious agenda to expand the scope of institutional competencies for local government, despite resistance from entrenched local groups. The details of these new structures were finalised in the *White Paper on Local Government* in 1998 and legislatively empowered through the Municipal Structures Act (1998). The hundreds of acts passed between 1994 and 1999 occasioned an expansion of urban local government mandates over housing, water supply and a large number of weak or poorly functioning council bodies. The restructuring of local government, the last level to undergo reform, encountered frequent opposition and crystallised as the site in which existing privilege was most robustly defended. Opposition parties favoured metropolitan governance arrangements that would enable minority parties to obtain a majority in sub-metropolitan structures (Cameron, 2000). However, the national government pushed back against these proposals. The subsequent Municipal Structures Act operationalised constitutional principles and instituted a one-tier local government structure in metropolitan areas to allow for integrated local development planning and a greater degree of redistribution of locally funded resources.

Gradual decentralisation transformed local governments into autonomous spheres with considerable financial independence. Indeed, the share of sub-national expenditure in South Africa amounts to 63%, higher than in most OECD member countries.[3] The provinces' share of total government expenditure is about a quarter higher than for municipalities: provincial governments account for 36% of total government expenditure, whereas municipalities account for 27% in 2011/12, according to the Financial and Fiscal Commission of South Africa. Though fiscal policy will be discussed in greater detail later

in this chapter, it is clear that intergovernmental co-operation and regional planning are obviously shaped by the financial capacity that municipalities and provinces have at their disposal.

The national sphere of government is a broad umbrella body which defines policy, determines and allocates funding and essentially operates as a co-ordinating and objective-setting layer of government, although some departments also directly implement programmes on the ground. The national sphere is specifically responsible for aspects of governance such as security, determining economic and fiscal policies, defence policies, international relations and so on.[4] Laws and policies are approved by Parliament, which is made up of the National Assembly, elected according to a system of proportional representation, and the National Council of Provinces (NCOP), with representation by provincial legislatures and local government. Each province has a set number of permanent and rotating representatives. The NCOP has to debate and vote on every law or policy pertaining to provincial or local government. Executive authority is invested in the President, who is elected by Parliament or the cabinet. The President elects a cabinet of ministers who are individually and collectively accountable to Parliament. Each cabinet minister is the political head of a government department.

Provinces have relative autonomy in lawmaking and policy development, but a limited capacity for revenue generation. A province's main spending responsibilities include health care (primary and secondary clinics, secondary district hospitals), provincial roads, agriculture and education, which includes primary and secondary schooling, adult education and training colleges. The Constitution [(115 (6)] vests provinces with the tasks of monitoring, support, co-ordination and capacity development of local governments. There is evidence of some confusion concerning the respective roles of local governments (including the metros in Gauteng) and provincial officials, particularly over interpretation of the oversight role of provinces. The relationships concerned are complex and will require renewed and ongoing attention for higher levels of co-ordination to be achieved. Essentially, provincial governments are the interlocutor between the macro and micro, translating the national development agenda into contextualised provincial frameworks. Provinces are further empowered to adopt provincial constitutions (as long as these are consistent with the national Constitution) and are represented on the National Council of Provinces (OECD, 2008). The Gauteng Province is governed by a Premier and a 73-member popularly elected Provincial Parliament, which drafts legislation, approves budgets and elects the premier every five years.[5] The Gauteng Province Programme of Action (POA) is currently underscored by seven strategic priorities.[6]

National and provincial government share a common five-year term of office. The last national and provincial elections were held in April 2009, meaning that the current political incumbents will be in office until 2014. The local government term of office is also five years, but offset by two years from the national/provincial term. The last municipal elections were held in May 2011, and a five-year term will come to an end in March 2016. This separation in the terms of office between the spheres has been seen by some as a major challenge, and there is now a national discussion under way about the possibility of synchronising the political terms in 2014 (by implication, the next local term of office will be only three years).

Municipalities are charged with providing basic public services – water and electricity distribution, sanitation, municipal road maintenance, refuse removal and solid waste management – and financing these mainly through user fees and taxation. The *Local Government White Paper* in 1998 outlined this form of local government, placing emphasis on integrated development planning and "developmental local governance".[7] Between 1998 and 2000, the scale and scope of developmental local governance were significantly extended: the Constitution required them to become "the primary development champion, the major conduit for poverty alleviation, the guarantor of social and economic rights, the enabler of economic growth, the principal agent of spatial or physical planning and the watchdog of environmental justice" (Parnell and Pieterse, 1999). In terms of local government, there are three categories of municipalities in the Gauteng city-region: A, B and C. The A Municipalities, called "metros", typically have an executive mayor and a City Council of both elected and nominated ward councillors (Box 3.1). Johannesburg, for instance, has a City Council of 218 members, of whom 109 are elected as ward councillors and 109 are nominated in terms of proportional representation on the basis of party lists. The councillors elect an executive mayor from among their number. Directly elected councillors have more responsibilities, including setting up committees in their wards to raise local issues and liaising with local ratepayers' and residents' associations.

Box 3.1. **Governing structures in the Gauteng city-region**

Gauteng officially came into being as one of South Africa's nine provinces after the first democratic elections in 1994. The province was initially called the PWV, because it is essentially a spatial and economic region broadly triangulated by Pretoria, the Witwatersrand and Vereeniging. It was renamed Gauteng in 1995.

The province's governing structure is formalised in the country's Constitution, promulgated in 1996. This establishes both a provincial and local sphere of government. National departments and national agencies also exercise powers and functions in the province. All three spheres have democratically elected representatives. The Gauteng Provincial Government has an elected legislature empowered to pass provincial laws in line with the competencies of provinces set out in the Constitution and to exercise oversight in relation to the provincial government. Executive authority is exercised by the Premier, who has the power to appoint members of a Provincial Executive Council (EXCO) and assign each member of the Executive Council (MECs) with portfolio responsibilities. Gauteng has ten MECs, each of which is the political head of a corresponding administrative department, in the following portfolios: Education; Roads and Transport; Health and Social Development; Infrastructure Development; Sports, Arts, Culture and Recreation; Agriculture and Rural Development; Economic Development; Housing and Local Government; Community Safety; and Finance. In addition, the Office of the Premier supports the Premier in his or her duties as executive head of government, and includes a Planning Commission to undertake short, medium and long-term planning; facilitate effective co-ordination across government; and strengthen performance monitoring, evaluation and resource allocation in line with priorities in provincial departments.

The local government sphere in the province is made up of three categories of municipality, as defined by the Constitution. These are Category A (metropolitan municipalities), B (local municipalities), and C (district municipalities).

Box 3.1. **Governing structures in the Gauteng city-region** *(cont'd)*

Gauteng's urban profile is dominated by Ekurhuleni, Johannesburg and Tshwane: three integrated single-tier metropolitan municipalities that cover a large geographic and population size. These "Category A" or metropolitan municipalities are authorities, separate from provincial and national government, with exclusive executive and legislative authority in their areas. "A" municipalities are generally well developed, with large areas of economic activity, and thus with substantial tax bases and relatively strong budgets. They have a single council and budget, and are subdivided into wards. Half the councillors are elected through a proportional representation system ballot: voters elect a party and the other half are elected as ward councillors by residents of each ward. They have an indirectly elected executive mayor who exercises executive authority on behalf of the council.

The rest of Gauteng Province is covered by two-tier local government arrangements representing nine municipalities of varied population size. The West Rand, Sedibeng and Metsweding are Category C or district municipalities – these are defined as municipalities that have municipal executive and legislative authority in an area that includes more than one municipality. Each Category C comprises in turn a number of Category B or local municipalities. Districts and locals share municipal executive and legislative authority according to the relative capacity of each tier to perform functions optimally. The local municipalities in Gauteng are Mogale City, Merafong, Randfontein, Westonaria, Emfuleni, Lesedi, Midvaal, Kungwini and Nokeng tsa Taemane.

Municipal jurisdiction	**Key urban centres and townships**
Ekurhuleni Metropolitan Municipality	Brakpan, Boksburg, Benoni, Germiston, Nigel, Springs, Kempton Park, Thokoza, Katlehong, Vosloorus
City of Johannesburg Metropolitan Municipality	Johannesburg, Sandton, Rosebank, Soweto, Roodepoort, Randburg, Midrand, Alexandra, Diepsloot
City of Tshwane Metropolitan Municipality	Pretoria, Centurion, Ga-Rankuwa, Mabopane, Soshanguve, Attridgeville, Mamelodi, Winterveld
West Rand District Municipality	
Merafong City Local Municipality	Khutsong
Westonaria Local Municipality	Westonaria Bekkersdal
Randfontein Local Municipality	Krugersdorp, Kagiso
West Rand District Management Area	Cradle of Humankind
Sedibeng District Municipality	
Midvaal Local Municipality	Henley on Klip, Meyerton
Emfuleni Local Municipality	Vereeniging, Vanderbijlpark, Sebokeng, Sharpeville
Lesedi Local Municipality	Heidelberg
Metsweding District Municipality	
Nokeng tsa Taemane Local Municipality	Cullinan, Rayton
Kungwini Local Municipality	Bronkhorstspruit, Ekangala

Note: As of 18 May 2011, the date of the last municipal elections, the Tshwane Metropolitan Municipality has been merged with the District Municipality of Metsweding and its two local municipalities, Kungwini and Nokeng tsa Taemane. Although these separate municipalities no longer exist, having been replaced by the now enlarged Tshwane Metropolitan Municipality, much of the data for this Review was assembled when they were still divided, and so they are still reflected here as separate.

Source: GCRO (2010a), *Background Report 1: Overview of Gauteng and the City-Region*, prepared for the OECD, GCRO, Johannesburg.

Intergovernmental mandates shared between provinces and municipalities are guided by the constitutional injunction of "co-operative governance" and encompass the concurrent mandates of housing, public transport and land use regulation. The embedded interdependence of spheres of government is reflected both in functional concurrency, a

broad set of financial relationships, and the designation of government levels as "spheres" rather than "tiers" (Levy and Tapscott, 2001). A spirit of co-operative intergovernmental relations has not been institutionalised, however, given that the constitutional assignment of functions does not require that the relevant sphere of government be necessarily responsible for direct delivery. By the same token, local governments may perform reimbursable agency functions on behalf of other spheres of government. For example, district municipalities may undertake road construction and maintenance work on behalf of the province, and other municipalities may provide library and health services. Other institutional arrangements for service delivery are possible, including the use of the designated public agencies known as special purpose vehicles (SPVs), as well as public-private and community-level partnerships. The responsibilities of different levels of national, provincial, district, and local government present several overlapping responsibilities for which intergovernmental collaboration is essential (Table 3.1).

Table 3.1. **The assignment of government functions in South Africa**

Spatial planning	National	Provincial	Local government	
	Regulation	Regional planning and development	Regional planning	Local planning and development control
Economic development	Macroeconomic policy	Industrial policy and promotion, regional economic planning	District tourism: promote economic development of community	Local tourism: promote economic development of community
Environment	Regulation	Planning and regulation	Environmental enforcement	
Transport	National roads, rail, major ports	Provincial roads and traffic, public transport	District roads, municipal public transport	Local roads, municipal public transport
Water	Bulk/dams			Bulk and reticulation, limited to potable water supply systems
Waste management	Regulation			Sanitation, limited to domestic wastewater and sewage disposal systems, stormwater, refuse and solid waste disposal, cleansing
Public safety	Policing	Policing oversight and traffic management		Metro policing, traffic management
Housing	Regulation	Implementation and policy		Implementation
Education	Tertiary	Primary and secondary		Early childhood development
Health	Regulation	Tertiary, secondary and primary	Municipal health	Municipal health

Source: South African Constitution (Act 108 of 1996).

The Constitution loosely allocates responsibilities for economic development across all three spheres of government. In South Africa, the current economic agenda is centralised at the national level, and limited amounts of funding are transferred to provinces for provincial roads and minor industrial sector support (agriculture and tourism). In this configuration, provinces are sometimes regarded as playing a peripheral role in industrial promotion and regional economic development. Though an in-depth legal analysis of South African constitutional law is beyond the scope of this Review, another interpretation holds that the expansion of provincial competency in industrial promotion and regional development and planning is entirely consistent with the Constitution. In other words, regional development is seen as a concurrent national and

provincial function, and provincial government is envisaged as a key intermediary, building links upwards to the overarching macroeconomic policy framework at the national level and downwards to the more detailed local economic development plans at the municipal level. The debate still seems to favour those who believe in a limited provincial developmental role (Robinson, 2007). However, in practice, provincial governments have been taking on more substantive responsibilities. The role of the Gauteng Provincial Government in driving targeted industrial strategies, as well as new economic infrastructure investments to promote tourism and innovation, is a case in point.

In terms of financial tools, responsibilities in South Africa are to a large extent decentralised, but many of the sub-national revenues are provided by the central level. About half of total government spending is committed by sub-national governments at the provincial level and the municipal level, which is fairly high in comparison with OECD member countries. However, the share of sub-national own revenue sources is only around 20%, a figure around the average for OECD member countries. This large difference between sub-national expenditure and revenue shares indicates a vertical funding gap. This gap is filled by central government grants, mostly to provinces. Municipalities, especially the metropolitan municipalities in South Africa, have relatively more fiscal resources. The situation in the Gauteng city-region is in line with this nationwide picture.

Large shares of income for the City of Johannesburg derive from their own resources, while the Gauteng Provincial Government depends more on transfers from the national government. The City of Johannesburg receives 40% of its revenues from service charges (mainly electricity) and 14% from property taxes, the main tax base for local governments in South Africa. Only 8% of its revenues comes from grants. The picture for the province is radically different: the largest share of revenues (70%) of the Gauteng Province comes from the general grant (called equitable share in South Africa), 24% from conditional grants and only 5% from own provincial revenue sources. The equitable share is based on an objective formula in which much weight is accorded to education- and health-related criteria. In 2009-10, 17.4% of the total equitable share from central government to the provinces went to Gauteng. The main conditional grants are those for health and human settlements. The most important own revenue sources in the Gauteng Province are the motor vehicle licenses tax, representing more than half of own revenues, and the casino taxes, representing a quarter (Gauteng Provincial Government, 2010b).

Most of the spending of Gauteng Province is on education and health, whereas electricity and water are the major spending items for local governments such as the City of Johannesburg. Total expenditures of Gauteng Province amounted to ZAR 60 billion in 2009-10; the budget of the City of Johannesburg represents around half of this amount. The main expenditure items in the Gauteng budget in 2009-10 were education (representing 38% of total provincial expenditure), health (37%) and transport (9%). Around 1% of the provincial budget consists of transfers to local governments in Gauteng, a third of which goes to the City of Johannesburg. The main expenditure items on the budget of the City of Johannesburg are different from the provincial ones: they mainly concern electricity (25%), water (13%) and public safety (7%).

Strategic planning in the Gauteng Provincial Government takes its direction from the electoral mandate of the democratically elected governing party. The mandate, broadly defined by the party manifesto, is interpreted by the provincial government at the start of the five-year electoral term of office, in the form of a medium-term strategic framework

known as the Gauteng Medium-Term Strategic Framework (MTSF). The current MTSF, for 2009-14, was adopted by the executive authorities of both the provincial government and local government in Gauteng. Annual priorities and programmes are outlined in an annual Intergovernmental Programme of Action (POA), based on the MTSF. Each year, in September and April, an intergovernmental forum known as the Extended Executive Council (EXCO) Lekgotla, convenes the political and administrative leadership of the provincial government, together with executive mayors and municipal managers – the heads of municipal administrations – of each of Gauteng's municipalities. The Extended EXCO Lekgotla discusses the high-level priorities for the year, and how these should find expression in current and future plans. These provincial priorities, programmes and projects are then expressed in the form of the annual Intergovernmental Programme of Action for the province. This is in turn translated into the annual performance plans of provincial government departments, as well as budgets.

The process of implementing the Programme of Action is overseen by a variety of structures. Aside from the Extended EXCO Lekgotla itself, committees of Members of the Executive Council (MECs), supported on the technical level by committees made up of heads of provincial departments, meet to guide the execution of key aspects of the Programme of Action and to identify and address any obstacles to implementation. In addition, MECs meet with their political counterparts in local government – the Members of Mayoral Committees (MMCs) from relevant portfolios – in so-called MEC/MMC Forums, to steer intergovernmental co-ordination in particular sectoral areas. An important further intergovernmental governance structure is the Premier's Co-ordinating Forum (PCF). This is a high-level forum including the Premier, a select number of MECs, and the mayors of Gauteng municipalities that meets four times a year. Its role is to discuss the alignment of provincial and local priorities, to monitor the implementation of the Intergovernmental Programme of Action, and to deal with policy and implementation matters arising from national to provincial intergovernmental structures such as the President's Co-ordinating Council, where the President of South Africa meets with premiers.

Local government currently utilises a wide range of planning tools in the Gauteng city-region. The single most important planning instrument are the integrated development plans (IDPs), five-year management plans that aim to link the municipal budget to a council's strategic plan and sectoral plans, including spatial frameworks, transport plans and infrastructure. Although municipalities have no jurisdiction over state-owned enterprises or provincial entities, the IDP should articulate how investments by parastatals, other spheres of government and the private sector will affect local needs, planning frameworks and budgets. Tasked with IDP approval, provincial government is ultimately responsible for approving municipal budgets, as established in the Municipal Financial Management Act (MFMA) (2003). Under this framework, the province exercises the power to channel its vision and principles to municipalities. Municipalities are required to take national and provincial policies and frameworks into consideration, although in reality, IDPs are frequently not aligned with neighbouring municipal and provincial budgets.[8] For example, spatial development frameworks (SDF) are legally required by the integrated development plans, but municipal capacity, limited vision and vested interests may reduce their quality.

Both the Gauteng Provincial Government and each municipality in the province produce spatial development frameworks. The Gauteng Spatial Development Framework (GSDF) was adopted by the province's Executive Council in 2010. It sets out a new long-term spatial vision for the province, together with spatial models and a set of spatial

interventions aimed at achieving the vision. Municipal spatial development frameworks are required to be produced and revised annually by the Municipal Systems Act. SDFs offer a vehicle to reflect long-term (20- to 30-year) visions for the future spatial form and development and attempt to integrate the forward planning of all sectors that impact spatial development, including integrated transport plans, environmental management, heritage strategies and plans, economic and social development plans, and infrastructure investment plans. If approved by the provincial government, municipal SDFs gain legal force and are required to form part of the IDPs of local authorities per the Municipal Systems Act. Though SDFs tend to be indicative, given the lengthy time horizon the plans address, the level of specificity in the SDFs should be detailed enough to provide direction to the five-year IDP, but not so specific as to make unanticipated changes difficult to achieve. Municipalities within Gauteng may also support the elaboration of district spatial development plans for each of the planning districts within a metropolitan area, but these tend to be much more detailed plans on specific zoning and development decisions in the near term.

Fostering intergovernmental collaboration for improved public service delivery

Since the inception of democratic government in South Africa, the provincial and local governments in Gauteng have built a significant body of practice of intergovernmental relations in the region. Most of the major infrastructure projects in the province have been achieved through intergovernmental co-operation, and this continues to be strengthened and refined. Positive aspects of co-operative governance include intergovernmental plans and planning structures to give effect to the Programme of Action, as well as the implementation of a range of key intergovernmental delivery projects.[9] Amongst the most important intergovernmental projects is the development of Gautrain, the multi-billion rand fast-rail link, which connects the major centres of Tshwane and Johannesburg with the O.R. Tambo International Airport in the eastern part of the region. While provincial government negotiated the major portion of government funding for the project, as well as the private-sector investment component, provincial and local government collaborated closely on the design of stations and station precincts. A number of other key infrastructure projects, such as the Newtown precinct, the Nelson Mandela Bridge, the Constitutional Hill precinct, Walter Sisulu Freedom Square and precinct in Kliptown and the Innovation Hub in Tshwane have been achieved through intergovernmental co-operation.[10]

The concurrency of responsibility across spheres of government, combined with numerous overlapping functions, create points of uncertainty that necessitate intergovernmental co-operation, especially in an area like the Gauteng city-region, where the functional area encompasses several political jurisdictions. Housing is emblematic of these concurrent mandates: it is an area for national and provincial responsibility, according to the Constitution, but local government must often find land and beneficiaries for low-cost housing and development projects. Similar debates persist on such topics as municipal/environmental health and electricity distribution. Consequently, the Human Sciences Research Council et al. (2003) concluded, "[t]here is confusion whether or not municipalities have the authority to perform a function. In some cases municipalities are simply not sure whether they have the authority at all, even when they actually do perform some activities." Faced with these challenges, the national government and authorities in the Gauteng city-region have attempted to reduce overlaps among spheres of governments.

This section will evaluate the recent introduction of both national-level performance management reforms and efforts in the Gauteng city-region to reduce overlaps and delineate responsibilities among spheres of government. The new South African National Performance Management System (2010) along with the Gauteng Intergovernmental Relations Framework (2010) will both be assessed for their potential to foster intergovernmental co-operation. These two high-level documents provide a lens through which to understand, but not necessarily to fully assess, the complexity of intergovernmental relations in the Gauteng city-region, for which primary research is necessary.

National-level performance management reforms

South Africa and Gauteng have undergone recent reforms to foster intergovernmental co-ordination. These policies stem from the admission that despite gains in access to public services and quality of life, additional reforms are required to optimise performance. As the Presidency of South Africa argued:

> …it should be acknowledged that the state has not performed optimally in relation to public expectations. Quality and service standards have not always improved, despite massive increases in successive budgets. In some areas service quality and standards have deteriorated…. This calls for a radical change in our approach. Genuine change based on critical self-reflection will be required. That means changes in how we behave, not just superficial adjustments to existing processes, systems and formats (2009).

This is particularly illustrated in health and education statistics. Accordingly, the South African intergovernmental system is being reconfigured to foster alignment with the new national performance management system that is at the heart of the new government's focus on improving service delivery that includes 12 outcome indicators (Box 3.2). This builds upon a series of legislative measures to stimulate intergovernmental co-operation. At a strategic level, this includes the Intergovernmental Fiscal Relations Act (1997) and the Intergovernmental Relations Framework Act (2005), which provides a framework for consultation and dispute resolution between spheres of government, predominantly through establishing a series of sectoral and budgeting fora for intergovernmental discussion.

While the national government has made progress in co-ordinating between line ministries, additional work remains to streamline vertical co-operation between national government agencies and sub-national government. Partnership between central and sub-central levels of government is crucial, if the objective of monitoring is to build co-operation and promote learning. Currently, each of the 12 outcomes is linked to a delivery agreement, which in most cases involves all spheres of government and a range of partners outside government. While the delivery agreement may contain longer term outputs and targets, it also includes outputs and associated targets that are realisable in the next four years. Though laudable, these goals are not sufficient in themselves to create dialogue between spheres of government to ensure experimentation and clarify responsibilities. The new intergovernmental Implementation Forums, charged with monitoring the deliverables of the outcomes, provide a promising innovation.[11] However, given their recent adoption in 2010, it is too soon to see how far they have provided reflective learning and improved policy governance and the delivery of public investment and services. Vertical co-operation between national government agencies and sub-national government is needed, and a rigorous third-party evaluation is merited to

assess the impact of Implementation Forums on public service delivery, dialogue and learning processes between different levels of government in South Africa.

Box 3.2. **The South African National Performance Management System**

The Cabinet Lekgotla held 20-22 January 2010 adopted the following 12 outcomes:

1. Improved quality of basic education.
2. A long and healthy life for all South Africans.
3. All people in South Africa are and feel safe.
4. Decent employment through inclusive economic growth.
5. A skilled and capable workforce to support an inclusive growth path.
6. An efficient, competitive and responsive economic infrastructure network.
7. Vibrant, equitable and sustainable rural communities with food security for all.
8. Sustainable human settlements and improved quality of household life.
9. A responsive, accountable, effective and efficient local government system.
10. Environmental assets and natural resources that are well protected and continually enhanced.
11. Create a better South Africa and contribute to a better and safer Africa and world.
12. An efficient, effective and development-oriented public service and an empowered, fair and inclusive
13. Citizenship.

At the end of April 2010, the President signed performance agreements with all 34 cabinet ministers. In these performance agreements, ministers were requested to establish an Implementation Forum for each of the 12 outcomes. In each Implementation Forum, ministers and all other parties responsible for delivering on an outcome will develop a "delivery agreement". All departments, agencies and spheres of government involved in the direct delivery process required to achieve an output, should be party to the agreement.

The delivery agreement is meant to refine and provide more detail to the outputs, targets, indicators and key activities for each outcome, and to identify required inputs and clarify roles and responsibilities. According to the government, these delivery agreements will spell out who will do what, by what date and with what resources.

Source: Presidency of South Africa (2011), "Guide to the Outcomes Approach", Republic of South Africa, Pretoria, *www.thepresidency.gov.za/pebble.asp?relid=1905*.

International experience suggests that the indicator systems being developed through the National Performance Management System will permit greater accountability and an assessment of progress. The wide range of indicators being used by several OECD member countries to measure sub-national services may provide a useful reference for South Africa (OECD, 2009a). The case of the Italian national "performance reserve" shows not only that indicators can be used to monitor whether outputs and outcomes are being produced, but also if policy implementation is effective. In the United States, an internal monitoring tool – the balanced scorecard – is used to ensure that short and intermediate process objectives are achieved within the US Economic Development Administration (Box 3.3). Certainly, both the EU and Italian performance reserves aim to hold regional actors accountable for results. However, it is clear that tracking

developments in regional development policy will require capacity for fulfilling indicator system requests, as well as for using them to improve public action (OECD, 2009a).

Box 3.3. Examples of performance indicator systems and incentives in select OECD member countries

The European Union (EU) Structural Funds: the EU Structural Funds, a main instrument of the European Union's regional policy, aim to reduce regional disparities in terms of income, wealth and opportunities. Europe's poorer regions tend to receive most support, although all European regions are eligible for funding under the policy's various funds. The Structural Funds invoke a "performance reserve", an inventive mechanism intended to encourage performance improvement by attaching explicit financial incentives to indicators and targets. The mechanism was implemented in a broader context of monitoring and evaluation activities by the EU that included a mid-term evaluation process. The reserve set aside 4% of a programme's total budget and distributed it only if specific objectives were achieved. In consultation with the European Commission, member countries selected their own indicators, chose their own approach to assessment, and each used the mechanism differently. Although the mechanism is no longer compulsory, it helped to raise awareness of the importance of monitoring and evaluation, as well as the need to improve monitoring systems and capacities. It was a learning experience at both the EU and national levels in terms of designing systems, selecting indicators, achieving targets, and using explicit financial incentives.

The Italian national performance reserve: Italy is a unique national example of the use of explicit incentives to improve the performance of regional development policy. During the 2007-13 programming period for EU Structural Funds, Italy is focusing on the provision of public goods and services in areas of greatest need. In order to reach those aims, an incentive mechanism is being implemented according to the ongoing seven-year strategic planning period per the Italian National Strategic Reference Framework. The mechanism is based on the definition of a set of 11 outcome indicators and targets related to certain collective public services that regions in southern Italy committed to improve. The selected services are education, child care and assistance to the elderly, water supply and waste management, all areas in which the regions of southern Italy lag behind the rest of the country and which are considered crucial for increasing the effectiveness of development policy. Targets are set as a minimum standard level for each region and are determined by reference to the national or European average. The mechanism envisaged for the assignment of the funds among regions takes into account the different starting positions of each area. Indicators and targets are selected on the basis of consultations between the central government and the regions. The central government will allocate to regions a financial incentive in the form of an additional grant (rewards), for a total amount of EUR 3 billion, at the end of the seven-year strategic planning period (in 2013), in proportion to the achievement of the targeted objectives.

The monitoring system for the US Economic Development Administration (EDA): this case demonstrates the importance of using indicators to generate information that can be used for decision making on both a short- and a long-term basis. As a national agency, the EDA is subject to the US Government Performance and Results Act (GPRA), which requires all federal agencies to report to Congress on the achievement of specific goals. As the results of EDA investments often materialise over a number of years, the administration projects and reports on indicators that track outcomes three, six and nine years after programme investments have been made. However, these and other data produced for the GPRA have limited use for short- to medium-term decision making. To meet their strategic information needs, the EDA combines reporting to Congress with the use of an internal balanced scorecard to monitor short-term progress.

Source: OECD (2009), *Governing Regional Development Policy: The Use of Performance Indicators*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/9789264056299-en*.

Reducing overlaps and delineating responsibilities among spheres of governments in the Gauteng city-region

Legal ambiguity obscures which government tier in South Africa is responsible for particular government functions. One of the causes of this problem lies in the phrasing of the Municipal Structures Act (1998), which leaves room for interpretation. The act often delegates responsibility to the municipality unless it has a broader regional effect, which calls for a higher level of government, such as the district municipal level. This ambiguity impedes regional economic development, including critical infrastructure investment (national, provincial, local and parastatals), industrial policy and investment promotion. This lack of clarity on concurrency feeds into the budget process, reducing not only effectiveness and impact, but the resources allocated and spent across the spheres for interventions to enhance regional or spatial economic growth and competitiveness (OECD, 2008).

Duplication and overlap persist across several concurrent mandates, and clearer delineation of responsibilities is called for.[12] This challenge is shared by OECD member countries across different institutional structures and constitutional systems (OECD, 2011). Housing is emblematic of these concurrent mandates: it is an area for national and provincial responsibility, according to the Constitution, but local government must often find land and beneficiaries for low-cost housing and development projects. This issue is by no means confined to the Gauteng city-region, as noted by evidence from housing projects in Cape Town.[13] Another instance is municipal health, which has now been redefined as "environmental health". This means that primary health care is now more clearly the sole responsibility of provincial government instead of municipalities'. Yet municipalities in Gauteng continue to provide it, utilising their own budget resources. The distribution of electricity has also been an area of contestation, and a proposal that six regional electricity distributors assume municipal functions of power distribution has only recently been shelved. There have been similar proposals for, and anxieties around, a regionalised water sector. Finally, social grants have been reallocated exclusively to the national government from the provinces to try to make the administrative system more effective.[14]

Concurrent mandates in the domain of housing are currently being clarified through an accreditation process. The Gauteng Provincial Government has devolved housing-related functions to select municipalities that take increased responsibility for the development of sustainable human settlements. The Department of Local Government and Housing has accredited three metros (the City of Johannesburg, Tshwane and Ekurhuleni) to carry out housing functions. The overall objective of accreditation is to accelerate housing delivery. To fulfil this objective, the Gauteng Department of Local Government and Housing will provide funding directly to the metros, in addition to the funding provided directly to metros from the national Department of Human Settlements through the Urban Settlement Development Grant (USDG).[15]

The concurrency of responsibility across spheres of government, combined with numerous overlapping functions, create points of confusion that necessitate intergovernmental co-operation, particularly where a provincial functional area includes or encompasses a local functional area (Table 3.2). The Municipal Systems Act (2000) attempted to clarify the allocation of powers and functions to local government through the assignment of special delegation powers, but did not provide a completely unambiguous allocation of responsibilities over government tiers (van Donk and

Pieterse, 2006). This has been exacerbated by other laws where the definition of responsibilities of district municipalities intrudes upon the tasks assigned to local municipalities. The National Health Act of 2003 illustrates such a case.[16] The national government efforts since at least 2005 to critically review and reform the distribution of powers and functions across the three spheres of government have produced few results to date. A 2008 local government review process driven by the former Department of Provincial and Local Government (DPLG) did achieve its intended results. After the 2006 municipal elections, a political decision was taken to prepare a new *White Paper on Local Government*. In 2007, a number of specialist papers were commissioned. These were synthesised into an overview analysis paper to lay the ground for a *Green Paper* by December 2007. During the first half of 2008, a draft *Green Paper* was prepared by Department of Planning and Local Government. However, it failed to achieve traction at the July Cabinet Lekgotla, and the entire process dissipated in the latter half of 2008. Since government changes in 2008, no significant changes have occurred in the framework of government functions in Gauteng.[17]

Table 3.2. **Overlaps in municipal and provincial policy areas in the South African Constitution**

Embedded local functional area	Provincial functional area
Air pollution	Pollution control, environment
Beaches and amusement facilities	Environment
Billboards and display of advertisements in public places	Environment
Building regulations	Provincial cultural matters
Child care facilities	Health services
Cemeteries, funeral parlours and crematoria	Health services
Control of undertakings that sell liquor to the public	Liquor licences
Facilities for the accommodation, care and burial of animals	Animal control and diseases
Fencing and fences	Provincial roads, agriculture
Firefighting services	Disaster management
Licensing of dogs	Animal control and diseases
Licensing and control of undertakings that sell food to the public	Consumer protection, health services
Local sport facilities	Provincial sport
Markets	Agriculture
Municipal parks and recreation	Nature conservation
Municipal planning	Regional planning, urban and rural development
Noise pollution	Environment, pollution control
Pontoons, ferries, jetties, piers, harbours	Environment
Pounds	Animal control and diseases
Refuse removal, refuse dumps and solid waste disposal	Environment, health services
Street trading	Trade
Trading regulations	Trade
Traffic and parking	Road traffic regulation

Source: Steytler, N. and Y. Fessha (2005), "Defining Provincial and Local Government Powers and Functions: The Management of Concurrency", unpublished paper, Community Law Centre, University of Western Cape, Cape Town, based on the Constitution of the Republic of South Africa (1996).

To address the issues of overlap, and following national trends, the Gauteng Provincial Government has embraced the shift towards outcomes-based government co-ordination and management. The hope is to overcome problems related to service delivery and infrastructure development. The Gauteng Provincial Government has translated the 12 national outcomes outlined earlier into the Gauteng provincial context.[18]

In this respect, the new Gauteng Intergovernmental Relations Framework (IGR), adopted at the Premier's Co-ordinating Forum (PCF) in July 2010,[19] serves as a direct response to a series of somewhat intractable problems with regards to intergovernmental planning and relations in Gauteng Province. According to the then Gauteng Department of Local Government (2008), these include:

- uncoordinated actions between province and municipalities, between provincial sector departments operating in the same municipality, as well as among neighbouring municipalities themselves;
- a lack of common understanding between provinces and municipalities regarding problems and issues faced at the respective levels;
- a lack of clarity regarding the requirements of the respective provincial sector departments, the level of detail required, as well as the relevance of the specific requirements for respective municipal IDPs;
- limited strategic guidance on key provincial directions to municipalities;
- difficulty for municipalities in gaining access to, and information on, provincial plans, policies, budget allocations and strategies;
- different information bases and standards used in planning have a negative impact on the ability of municipalities to draw up realistic and sensible IDPs;
- different approaches to IDPs by respective municipalities and a perceived feeling of mutual mistrust and a lack of empathy on local specific circumstances;
- IDP assessment (through checklists of provincial requirements) that does not necessarily correspond with local priorities or the spirit of IDPs; and
- a lack of formalised structures or processes to ensure a meaningful provincial engagement in the preparation of IDPs.

A raft of other issues points to severe intergovernmental gaps in the Gauteng city-region. First, there is clear evidence of duplication of effort between different levels of government and sometimes between agencies of government and departments. Secondly, the continued disjuncture between the planning and financial annual (and electoral) cycles[20] of provincial and local government reduces synergy between the provincial and municipal levels of government and produces few moments of confluence. The disjuncture is believed to contribute to a lack of alignment in plans and delivery programmes, especially where functions are shared between different levels of government. Thirdly, the framework notes that a number of critical bodies are excluded, including Provincial Parliaments and sectoral intergovernmental forums that deal, for example, with housing, transport or health.[21] Fourthly, the national Intergovernmental Relations Framework Act (2005) does not provide for any firm levers to ensure compliance across levels of government, because intergovernmental alignment is treated as a voluntary requirement. Fifthly, local and provincial government capacity to undertake intergovernmental actions is seen as deficient – especially outside the three metropolitan city governments. In certain instances, the staff to perform these functions are simply lacking or are identified on an *ad hoc* basis.

The Gauteng Intergovernmental Relations Framework arguably does not pay enough attention to the strategic importance of municipalities' IDPs. The IDP is meant to be a high-level strategic analysis of the unique development challenges in the municipal

territory, based on a careful analysis of trends and a deliberative process that cuts across sectoral departments and includes members of civil society and the private sector. This deliberative process is meant to produce a medium- to long-term strategy with clear priorities that require specific programmes to achieve. Once this is in place, sectoral contributions to these priorities can be clarified and justified. However, if IDPs simply serve to summarise and collate all the plans and activities of the sectoral departments, which is the tendency that the new Intergovernmental Relations Framework Act (2005) approach reinforces,[22] they will not be strategic or integrated. This is contrary to the original intention of the IDP instrument as a form of strategic planning, which allows municipalities to move away from comprehensive thinking to a more surgical approach.

The Gauteng Intergovernmental Relations Framework could strengthen feedback loops to ensure that provincial policy better reflects local municipal priorities. Currently, feedback takes place through several consultative processes, including the Extended EXCO Lekgotlas, the Premier's Co-ordinating Forum and MEC/MMC Forums. The clear assumption within these processes is that the projects are needed and must be implemented because they are the only route to the desired five-year outcome. It is also clear that the provincial Programme of Action is premised on a national and provincial perspective of priorities, because they derive from the 2009-14 Medium-Term Strategic Framework (MTSF) produced by the national government. It is not clear how local needs and priorities identified via the IDP participatory and strategy development process can practically shape a provincial Programme of Action. The Intergovernmental Relations Framework on the one hand promotes IDPs as the primary mechanism for alignment. On the other hand, the Programme of Action is not open to substantial "bottom-up" change by municipal inputs. Though forums are available for providing feedback,[23] critics consider the channels available to change the POA as limited. This unresolved policy debate requires urgent clarification and may require the introduction of new intergovernmental co-ordination tools. It is complicated by the fact that provincial governments are predominantly responsible for social development functions (80% of their budgets) and are almost entirely reliant on transfers from national government, whereas local governments hold a comprehensive range of functions and generate up to 80% of their own revenue. This gives them a lot more room for manoeuvre than the provinces and is a strong driver of intergovernmental miscommunication and occasional conflict.

The Gauteng city-region provides the ideal laboratory in South Africa to test innovative approaches for resolving questions of intergovernmental co-ordination. Unlike Cape Town, Durban or Nelson Mandela, Gauteng is divided between three metros in terms of the Municipal Demarcation legislation, whereas the others have metro municipalities more or less incorporating the whole city-region (and sometimes more). It is evident that greater collaboration between municipalities is required in the complex and urbanised environment of the Gauteng city-region than elsewhere in South Africa. In addition, most of the Gauteng Province's population is within these three metros, and their relationship with the provincial government is likely to be very different from that in other provinces. Third, being a small province covering most of a large city-region, it is inevitable that close collaboration will be required concerning areas that straddle provincial boundaries too. If development is to occur, national, provincial and local authorities must find ways to air differences and reach agreement; and whether or not national legislative frameworks remain the same, it is critical that the Gauteng Provincial Government's past and present explorations continue apace. Indeed, the *OECD*

Metropolitan Reviews have not found any major trend towards single authorities in city-regions, but rather processes of collaboration, as well as mutual learning.

A series of measures could be taken in the Gauteng city-region to resolve the powers and functions debate at the national level. These include:

i) Firstly, it is vital to develop a more robust and empirically grounded understanding of the causal drivers of intergovernmental relations (IGR) misalignment. An IGR Working Group comprised of the three metropolitan city governments, the Districts and the South African Local Government Association (SALGA) in the province, provincial government and ideally a representative from the Department of Co-operative Governance (COG) could be established.[24] Its mandate could be to develop an evidence-based framework for understanding the reasons for misalignment, and good practices based on a review of all the key sectors that underpin the Gauteng Employment Growth and Development Strategy (GEGDS). The negotiated nature of the institutional transition from the apartheid state left a number of structural legacies that still profoundly influence how officials and experts regard each other across sectoral and governmental divides.

ii) Secondly, the Gauteng city-region can collaborate with other city-regions, the South African Cities Network and the South African Local Government Association (SALGA) to advance the finalisation of powers and functions debate. This is essential for a number of other processes that bedevil effective co-ordination and integration, especially in critical built-environment functions and the national spatial planning system. The Presidency and the Department of Rural Development and Land Reform are attempting to resolve legal uncertainty about the spatial planning system by finalising a national Land Use Management Bill.[25] This bill would benefit from the input of local and provincial government authorities in Gauteng.

3.2. Reforming national housing policy to confront spatial inequality

Housing policy is a prime area of policy attention, given the challenges of housing delivery after apartheid; the pressures of a rapidly growing population, and increasing housing demand. As noted earlier, the housing backlog in Gauteng is increasing by 52 500 units per year (Gauteng Provincial Government, 2009). This is in line with national trends: South Africa still has a backlog of the size it had in 1994. While 2.5 million households have been served by the housing subsidy scheme, an estimated 2.5 million are still waiting for assistance (Rust, 2009). Consequently, nearly one-fourth of Gauteng's residents live in informal housing. In light of these issues, this section will outline governance to create affordable, vibrant, and accessible neighbourhoods. It will also suggest how to: *i)* clarify concurrent mandates shared between provincial and municipal governments over land management; and *ii)* prioritise the upgrading of informal settlements.

3.3. Harnessing financial tools to expand infrastructure and economic opportunity

One of the main challenges for competitiveness in the Gauteng city-region is adequate funding for transport infrastructure and the provision of public transit. Most public spending on public transport originates from the central government in the form of transport grants. Important transport grants from central to sub-central governments in South Africa are the Public Transport Management Grant (commuter rail services, bus

subsidies and Gautrain), the Public Transport Infrastructure and Systems Grant (integrated public transport networks mainly by municipalities) and the Taxi Recapitalisation Grant. The national government and the Province of Gauteng jointly fund Gautrain, which is also partly privately funded and presents the largest public-private partnership project in South Africa. Municipalities spend relatively limited amounts of their own funds on public transport. Although the City of Johannesburg spends around 5% of its budget on road transport, its expenditure on public transport is marginal.

Value for money in transport spending could be improved by tackling some inefficiencies in commuter subsidies and co-ordination between transport and other sectors. First, commuter subsidies could be reformed. Subsidising workers to travel to work from distant townships helps sustain urban sprawl, which keeps public transport expensive.[26] In addition, incoherencies may be identified in the different elements of the transport policy. Large-scale road investments encourage a sprawled urban form that is generally not favourable to public transit. Second, poor co-ordination between transport and other sectors, such as housing, undermines the efficiency of public spending in transport (Republic of South Africa, National Treasury, 2008).

Current funds are insufficient to deal with the demand for transport, according to the South African Financial and Fiscal Commission. Subsidised bus services have accumulated deficits, due to a financing scheme in which the subsidy was linked to the number of tickets sold, but without budgeting for an increase in passenger numbers. This changed in the fiscal year 2009-10, when the Public Transport Operating Grant was transformed into a subsidy per kilometre. However, accumulated deficits added up to a projected shortfall of around ZAR 0.5 billion in 2009-10, and it was left to provinces either to cut expenditures or raise additional revenues (Financial and Fiscal Commission, 2010). There are funding gaps in other transport areas as well. When bus rapid transit was introduced in Johannesburg in 2006, the expectation was that operating subsidies would not be required, as the capital investment would drastically increase operational efficiency and reduce operating costs. However, it is now estimated that operating subsidies will in fact be needed. Considering the cost escalation on the Gautrain project (estimates having risen from ZAR 3.5 billion in 2000 to ZAR 28.4 billion in 2010), further operating subsidies could be needed (Financial and Fiscal Commission, 2010).

Insufficient funding has become a more pressing issue for municipalities in Gauteng, now that transport responsibilities have been decentralised. The new National Land Transport Act, passed in 2009, introduces significant changes to the allocation of responsibilities for public transport among spheres of government. It provides, in effect, for asymmetrical devolution of power, placing responsibility largely on metropolitan authorities. For example, it makes metropolitan city governments responsible for managing bus contracts previously handled by provinces. This in turn demands a reassessment of associated intergovernmental fiscal mechanisms. Metropolitan city authorities could now be subject to large financial risks, particularly in areas where subsidy requirements have risen above the amounts budgeted, as in the case of bus subsidies.

New revenue sources for local and provincial governments could help sustain funding of transport infrastructure. A wide variety of funding sources for metropolitan transport financing are available in OECD member countries. Considering Gauteng's sprawl, "smart financing" mechanisms in which revenue generation is combined with incentives for densification could be helpful. Additional road infrastructure could be charged to

developers who build the new housing that the roads would have to service (development charges), and value increases due to new infrastructure (e.g. Gautrain) could be completely or partially recuperated via increment value tax. Other possibilities include the sale of additional development rights at prime locations by increasing the maximum building heights, a practice that has proved successful in São Paulo (Box 3.5) and Mumbai.

Box 3.5. **Selling building rights in São Paulo, Brazil**

The São Paulo Municipality (Brazil) has been successful in using new financial instruments to generate resources for urban regeneration and infrastructure investment in various parts of the city. Building rights in excess of USD 1.2 billion have been sold by the municipality in the last six years in two "Urban Operations". These projects are based on the sale of additional floor space. The municipality changed Land Use Occupation Law regulations over floor-area ratio (FAR). The total available stock of new building rights made available through this programme may be used by the transfer of individual lots or virtually, through property certificates of built area called Special Additional Potential Construction Certificates (*Certificados de Potencial Adicional de Construção*, or CEPACs). CEPACs are issued by the city and purchased by individuals who link them to their plot of land, thus increasing the total FAR permitted. These securities are issued by the municipality, and the funds are transferred to the Treasury, where they remain in a fiduciary account. CEPACs are issued and traded in the São Paulo Stock Exchange, which requires intermediation from a financial institution such as Banco do Brasil. No guarantees, however, are given by the financial institutions. The CEPACs are intended to create reserves for carrying out public works, such as subway extensions, which aim to increase mobility and improve infrastructure under the city's master plan. Though property values around the area typically increase, the Urban Operations are intended to encourage mixed use and increase the square metres available for residential and commercial development, thus creating value for the real estate market.

Different conversion rates of CEPACs into building areas allow city planners further discretion over incentives for specific sub-areas in the same Urban Operation. If, for instance, a conversion rate in a sub-area is set for 2, it will cost half as much to buy an additional square metre than in a sub-area where the conversion rate is 1. City planners can then incorporate relative market prices for different sub-areas, so as to set conversion rates that will encourage development in that sub-area. Different conversion rates for commercial or residential use can also encourage development in the desired use and in mixed-use development.

The municipal law that creates each Urban Operation designates SP-Urbanismo (a public company linked to the Urban Development Secretary developing the Urban Operation Master Plan) as responsible for managing the process, controlling the finances and supervising contractors for the construction. The law also encourages community participation by stipulating that members of civil society should be represented on managerial committees.

Source: Fróes, M. and J. Rebelo (2006), "Urban Operations and the São Paulo Metro Line 4", World Bank, Washington, D.C., *http://siteresources.worldbank.org/BRAZILINPOREXTN/Resources/3817166-1185895645304/4044168-1186329487615/UrbanOperationsandtheSaoPauloMetroLine42006.pdf*; Pires de Oliveira Dias Neto, D. (2010), "Note to OECD Secretariat on Gauteng", 30 August.

The city-region would do well to build an "infrastructure barometer" and municipal infrastructure asset management systems. This would facilitate the development of a fine-grained understanding, independent of vested sectoral interests, of its infrastructural network and how this shapes Gauteng's development prospects in terms of the economy, reduction of poverty, environmental resilience and social inclusion. Such an in-depth and sober knowledge of the political economy of land and property markets would be

indispensable. Almost every attempt by all levels of the state in the past 18 years has been frustrated by a lack of understanding of real estate dynamics in a fiscal context where local governments are reliant on property-based taxes for the bulk of their own revenue.

The balance between the use of private cars and public transport could be shifted, and congestion reduced, by introducing more incentives to discourage car use. The impact of the new financing mechanisms currently foreseen for the Gauteng Freeway Improvement Project will have to be monitored and possibly extended in the medium and long term. In this project, freeway upgrades (widening freeways) will be financed through tolling, requiring vehicles to carry an electronic tag. When vehicles pass under one of 38 overhead gantries, the toll will be paid automatically. Based on careful analysis of drivers' behaviour, price elasticities might be identified that could help to extend the toll system and transform it into a congestion charge in the longer term (e.g. when the second and third phases of the Gauteng Freeway Improvement Project are finalised).

More public funding for infrastructure development could be provided through a reform of the intergovernmental grant system. Presently, territorial disparities in South Africa are sustained by financing arrangements such as the equitable share. Although the equitable share (the equalisation grant for local governments) focuses on poor households, many urban areas in South Africa include large populations of what has been defined as "near-poor" households, whose income is just above the poverty threshold. They might be able to afford paying fees, but their income will certainly not be enough to generate revenues that can cover the full costs of services related to water, electricity, sanitation and solid waste removal. These gaps between service costs and citizens' ability to pay may be more substantial in urbanised areas such as Johannesburg. An additional disadvantage in this respect is the allocation of funds based on residential address rather than work address. Such a criterion does not compensate the Gauteng city-region and its constituent cities for the large stream of migrant workers who live and work in the area and use its infrastructure. This sustains spatial inequalities. A related problem is that one of the allocation criteria of the equitable share is population, but this is based on the past Census, which does not represent current trends or population projections, since it is based on Census data, which are only updated every ten years. As a result, growing provinces like Gauteng will continue to receive relatively fewer grants per capita than declining provinces. Reform of the equitable share, which would address these challenges, is warranted in order to limit spatial inequalities. Comprehensive reform of equalisation grants is relatively rare in OECD member countries, but has been successfully carried out in Switzerland.

3.4. Embedding the city-region concept in metropolitan transport and environmental policy

Metropolitan co-ordination is essential in the Gauteng city-region to ensure that sectoral policies are coherent, or at least not contradictory, in a functional metropolitan area that spills over multiple jurisdictions. The vision of the Gauteng city-region as expressed in the Gauteng Provincial Government's (2004) *A Golden Opportunity: Building Gauteng as a Globally Competitive City Region* is an unfinished project. Advancing this vision will require: *i)* political commitment and consensus behind the notion of a metropolitan approach to policy; and *ii)* new forms of "light" co-operation, such as associations and strategic planning partnerships. Policy makers could target two critical areas to transform the city-region vision into a practical reality: *i)* metropolitan transport; and *ii)* environmental policy making.

Embedding the city-region concept in policy

The construction of a Gauteng city-region agenda represents a significant step towards greater intergovernmental co-ordination, alignment and joint implementation. Though the idea of planning for what is now Gauteng has a long and multi-faceted history,[27] the Gauteng city-region (GCR) perspective was officially adopted in 2004, following a series of new approaches to planning and redevelopment of core urban nodes. The Gauteng city-region agenda was also informed by the National Spatial Development Perspective (2003) and recognised that the functional economic catchment areas linked the three metropolitan powerhouses to Rustenburg, Klerksdrop/Potchefstroom, Sasolburg in the south and Witbank/Middleburg/Sekunda in the northeast. This new vision emerged in 2004 in the Gauteng Provincial Government's *A Golden Opportunity: Building Gauteng as a Globally Competitive City Region*:

> [T]he changing circumstances and increasing economic importance of urban Gauteng requires that we change the scale of our focus. Government's predilection for administrative geography, based on provincial and local government boundaries and jurisdictional demarcations, does not easily relate to how urban Gauteng actually functions in the national and international space economy….From this viewpoint, it is relatively easy to see that alignment of development plans and programmes becomes critical if we wish to improve the efficiency and performance of Gauteng's economy….the lesson for Gauteng is relatively simple – *for our city-region to compete better externally, we must co-operate internally.*

After the release of the Gauteng city-region platform in 2004, the city-region concept attained significant traction.[28] It was reinforced by the Provincial Spatial Development Perspective for Gauteng, which aims to address unequal economic growth and the intergovernmental challenges to ensure shared prioritisation. The agenda also attained significant national visibility, especially after it was mentioned in the South African Cities Network's *State of the South African Cities Report* (2004).[29] The *State of the Cities Report* was noted by the Premier's Office in the Gauteng Provincial Government, which incorporated the Gauteng city-region concept into the Growth and Development Strategy for the Province's 2004-09 term of office. The Gauteng Growth and Development Strategy 2004-09 identified the Gauteng city-region as a key "mechanism" for implementation, especially with respect to institutional arrangements for decision making and co-operative governance, business connectivity, and achieving balance between social and economic progress, growth and redistribution. Later, this vision was reiterated and incorporated into municipal planning documents in Johannesburg and Tshwane.[30]

The Provincial Government of Gauteng later converted the Gauteng city-region perspective into a detailed action plan, dubbed the GCR Roadmap, which identified 11 strategic pathways and was adopted by the Premier's Co-ordination Forum. From 2007 onwards, a wide range of further background studies and engagements were undertaken, guided by the Roadmap, to help flesh out core ideas. These included: *i)* the development of options for a Global City-Region Urban Observatory, through a two-phase study, first, of urban observatory practice elsewhere in the world and second, a needs and capacity assessment; *ii)* an assessment of all development agencies in Gauteng; *iii)* an international conference on city-province governance arrangements; *iv)* a report on economic characteristics and linkages defining the region; *v)* the development of a framework for GCR branding; *vi)* the development of benchmarking indicators and possible benchmark partners; and *vii)* a proposal for the establishment of a GCR Academy, designed to develop core skills sets needed by a competitive city-region.

Arising from the roadmap, extensive work was also done on the development of a Gauteng-wide Transport Framework, a Gauteng Spatial Development Perspective, a Gauteng Innovation Strategy, a Gauteng Social Development Framework, a Gauteng Planning Commission and a long-term vision and plan for the GCR. A number of these studies led to the establishment of new structures and programmes designed to concretise the Gauteng city-region in practice. Structures such as the Gauteng City-Region Observatory and the Gauteng City-Region Academy, also set up in 2008, continue to gather strength, and remain important in projecting the Gauteng city-region as a concrete commitment by governments in the region, not simply a planning concept.

Despite this momentum, intergovernmental partnerships in the Gauteng city-region are still in the early stages. The use of the term "Gauteng city-region" has sometimes been mistaken to mean a step towards the amalgamation of all municipalities in the region into one overarching government, an idea rejected in South Africa. A study was first commissioned in 2007 to explore the feasibility of different metropolitan forms of government.[31] One model described by the study included the extension of the three existing metropolitan councils to include adjacent local municipalities, plus the creation of a fourth metro in the south of Gauteng. The creation of a single "local government" for the whole province is a more radical alternative. It is not clear which model, if any, would provide the most advantages for the Gauteng city-region. A rigorous analytical debate on the arguments for and against the metropolitan city model in the Gauteng city-region, however, has not yet been conducted. This makes rational evaluation of such a model difficult. The question of the effectiveness of mergers of regional and local governments, and the optimal size of sub-national government in a broader sense, is a difficult one, and studies on the subject tend not to show unambiguous results. Much seems to depend on the context of the specific case. Given the mixed outcomes of regional and local government mergers in OECD member countries, an assessment of costs and benefits of such an amalgamation in the Gauteng city-region would be necessary in order to determine its usefulness. Some provincial government representatives see this as a viable route for exploration, while local government actors are opposed to such a notion. If this policy disagreement is not effectively addressed and managed, it could fuel antagonism between the spheres and frustrate the agenda of more effective co-ordination and integration at a city-region scale. To this end, the Gauteng city-region suffers from two main weaknesses: *i)* the lack of a clear and widely shared city-region "vision"; and *ii)* the urgent need for a dynamic body capable of co-ordinating action in this field.

Two critical areas can be identified as tasks for collaboration within the Gauteng city-region. The first is to reinvigorate political consensus behind the notion of a metropolitan approach to policy. An important first step would be to state clearly that each entity has shared interests and that where possible, they should work towards a common vision of the role of the city-region. Secondly, new forms of "light" co-operation need to be encouraged to improve the productivity of firms in the region and increase investment. At the "light" end are informal co-ordination bodies such as platforms, associations or strategic planning partnerships, often relying on existing networks of relevant actors without necessarily following the logic of territorial boundaries. The lighter forms of inter-municipal co-operation are generally engaged in mobilising local actors around common development projects as well as longer term strategic vision. The Association of the Lyons Urban Region in France, for example, brings together several municipalities in the functional region[32] to draft strategic plans on a wide variety of topics

such as mobility, sustainable development policies, attractiveness, infrastructure, logistics, and public service delivery (OECD, 2006a).

A strengthening of co-ordination could become the first step towards a rigorous analytical debate on more formal tools for city-region-wide collaboration. More radical governance options in the Gauteng city-region might be needed, for which a strategic debate could be formulated. Given the mixed outcomes of regional and local government mergers in OECD member countries, however, an assessment of the costs and benefits of such tools in the Gauteng city-region would be necessary to determine their usefulness. Serious reflection based on cost-benefit and sensitivity analyses is needed to assess the tools the Gauteng city-region could employ for its future, such as a metropolitan government. Reliable estimates on costs and benefits of mergers, including an assessment of the political support and transaction costs, would be essential for an informed assessment of the merits of municipal mergers as opposed to less radical inter-municipal co-ordination mechanisms. Such information does not appear to exist for the region.

Elaborating a politically agreed commitment to the city-region concept

The first area of policy making to which more attention could be paid is in galvanising political support for the city-region's development agenda. At the moment, the incentives for local politicians to promote the city-region agenda are limited. By and large, a spatial conceptualisation of the Gauteng city-region has not informed agenda setting or policy formulation, though to its credit, the Gauteng Provincial Government (2004) admits that "the development of the Gauteng global city-region is complex by its very nature, and a long-range project". A non-binding spatial vision of the area, such as that articulated in the Gauteng Spatial Development Framework, has the potential to change and generate policy formulation by a wide variety of actors. Without strong and unified political backing, the benefits of co-ordination are lost because implementation in the end depends on delivery through elected political entities.

Municipalities in the Gauteng city-region, in collaboration with the newly created provincial Gauteng Planning Commission,[33] may consider developing a clear strategy for the future development of the metropolitan region. This would essentially be a statement of common interest and a commitment to co-operate on shared objectives (OECD, 2006a). An example of this type of regional "charter" is provided by the recent Concordat between the neighbouring cities of Liverpool and Manchester in the United Kingdom, which was signed after an extensive review of the competitiveness and potential of the two urban regions undertaken by the European Union (Box 3.6). Liverpool and Manchester are approximately 52 kilometres from one another, approximately the distance between Johannesburg and Tshwane.

A political statement of common interest would also need to be informed by a global vision concerning the place of the Gauteng city-region in the world economy. This would review the competitive advantages that the Gauteng city-region offers, relative to those of similar cities. In this reassessment, the assets refer not only to those found in Johannesburg, Tshwane and Ekurhuleni, but also to how new assets can be developed across the wider region. This political statement could be supported by a range of flagship projects designed to illustrate positive examples of collaboration in key areas of the regional vision. Gauteng could build upon the light forms of collaboration developed during the FIFA 2010 World Cup to attain regional economic development goals.

Box 3.6. **The Liverpool and Manchester Joint Concordat**

The Concordat, signed between the city governments in September 2001, is a political statement of shared interests that focuses on developing a joint approach in key fields such as sector development, higher education provision, lobbying and image building, and infrastructure development. The Concordat was based on a "Vision" developed by a working group led by a prominent academic that investigated the concept of common action by distinct administrative bodies and identified the areas where co-operation might be beneficial and where competition should be avoided. The Concordat was launched by the Deputy Prime Minister and was evaluated as a model for other city-pairs across the European Union. The following is an extract from the political statement:

> "We recognise that healthy competition between the two cities is at times appropriate and that competition will lead to benefits in its own right. We recognise our distinctiveness. We focus on our distinctive strengths and specialisations and always attempt to develop the individual identities of the two cities. We concentrate on areas of mutual benefit. But we agree that there are many areas where the two cities can and should work together more actively for our mutual benefit and for the wider Northwest. In practical terms what does this mean?
>
> - When outside the region, will act as one in selling each other's positive points and those of the region.
> - Look to share cost of external promotion and co-ordinate activity wherever possible.
> - Support each other's bids unless they are in direct competition.
> - Share experiences and expertise.
> - Work on building linkages. Facilitate greater day-to-day links. Through our independent strategies, try and encourage flows between the two cities. More flows of information, ideas, transactions, and where appropriate, people.
> - An inclusive approach. We recognise that collaborative working between Liverpool and Manchester will be for the region's benefit and that as cities we are not islands. Often the two cities may be at the core of actions or projects, but not to the exclusion of other parts of the region that may have important roles to play."

Source: Meegan, R. (2005), "British Cities and the EU: The Cases of Liverpool and Manchester", in Antalovsky, E. et al. (eds.), *Cities in Europe – Europe in the Cities*, Europaforum Wien, Center for Urban Dialogue and European Policy, the European Institute of Urban Affairs at Liverpool John Moores University (EIUA) and the Department of Spatial Development, Infrastructure and Environmental Planning atVienna University of Technology, *http://www.ljmu.ac.uk/EIUA/EIUA_Docs/cities_in_europe.pdf*.

Incubating "light" inter-municipal collaboration

Soft governance arrangements could be conceived as a first step towards a more formal collaborative governance framework. New mechanisms could emerge from city networks to fill the city-region institutional gap and ensure free dialogue and co-operation among the cities in Gauteng. Light forms of inter-municipal co-operation could mobilise local actors around common development projects, as well as the longer term strategic vision discussed earlier. One example is the Council for the Stockholm Mälar Region, which covers an area larger than the Stockholm functional labour market. It includes five counties and features increasing commuting flows, clusters and business linkages, as well as spatial specialisation of higher education institutions. In 2003, acting as a

bottom-up network, the Council for the Stockholm Mälar Region proposed a regional vision addressing such issues as co-ordination of infrastructure and transport, economic development and integration within the Baltic Sea area (OECD, 2006b).

Polycentric metropolitan regions, such as the Gauteng city-region, are particularly keen on "soft governance arrangements", focusing on strategic spatial planning development objectives rather than on place-specific projects or programmes of action. Many of those "governance partnerships" for polycentric regions are bottom-up initiatives originating in the municipalities themselves, rather than driven by the national government, often working with partners from private and voluntary sectors and other public and private agencies (ESPON, 2005). These partnerships do not have decision-making powers, but can influence decisions by making recommendations to the decision-making bodies. The key objectives followed by these governance partnerships are usually strategic development, project orientation, networking, and advocacy. The project-based approach of the Randstad, aimed to stimulate rapid decision making about urgent infrastructure projects, provides a powerful example of metropolitan co-operation in a polycentric area (Box 3.7).

Box 3.7. **Project-based governance arrangements in the Randstad, Netherlands**

Since 2007, governance challenges in the Randstad have been tackled by joint programmes and projects, rather than metropolitan government bodies. After a negative evaluation in 2007, the platform organisation Regio Randstad (representing the four provinces, four main city-regions and four main cities forming the Randstad), was abolished. Based on OECD recommendations (OECD, 2007) a more centralised and project-based approach was followed. A Minister for the Randstad was appointed and a Randstad Urgency Programme established, which aimed to stimulate rapid decision making about urgent projects, mostly concerned with infrastructure, in order to reinforce the Randstad's international competitiveness.

This programme consists of a collection of concrete projects. Every year a new selection of projects is made: 35 projects in 2007, 33 in 2008 and 22 in 2009. Once the main decisions for a project have been taken, the project no longer forms part of the Urgency Programme. For each of the projects, two parties are made responsible for progress in decision making: one a political representative from the national government and one from the regional government. These two representatives sign a document ("contract") in which the timeline for the major decisions in the project is fixed. An "ambassador" is appointed for each project to assist and advise the duo. A programme directorate consisting of civil servants monitors the progress of the different projects and intervenes when delays occur. Every year, a conference is organised to attribute "fame and shame" to those who were or were not successful in realising the timelines in their contract.

At the beginning of the new government period in 2007, the Minister of Transport and Infrastructure was appointed Minister for the Randstad. In this ministry, a programme directorate has been formed to co-ordinate the Randstad Urgency Programme.

Box 3.7. **Project-based governance arrangements in the Randstad, Netherlands** *(cont'd)*

To improve the coherence of the public transport network in the Randstad, a public transport co-ordination body for the Randstad (*OV-bureau Randstad*) was created in 2009. This initiative followed a recommendation in the *OECD Territorial Review of the Randstad Holland* to improve region-wide transport planning, based on a programme-based approach and possibly by creating a project management organisation. The *OV-bureau Randstad* is a co-operative arrangement between national and regional public transport authorities, using staff assigned from the nine participating transport authorities in the region (currently ten staff members). The organisation has a mandate for 2.5 years and its priorities include the improvement of the public transport network, multi-modality and more effective use of railways for regional transport. It will define a common vision for a high-quality public transport network in the Randstad and identify connections that seem to be missing. In order to improve multi-modality, it will focus on improving public transport nodes, park-and-ride facilities, bicycle parking facilities and traveller information. It is too early to assess its effectiveness, but depending on the obstacles it faces, the organisation might be granted more instruments to produce a high-quality public transport network.

Source: OECD (2010), *National Place-Based Policies in the Netherlands*, OECD Publishing, Paris.

Another form of light collaboration could consist of supporting knowledge-sharing and joint training at the city-region scale. This would entail joint interventions where applicable between the various local authorities, especially among the three metros. Existing partnerships could be organised to help identify joint problems and to build place-based knowledge about the lack of clarity on roles and responsibilities between different levels of government toward the state-owned enterprises and the plethora of specialist agencies that operate in the city-region. Municipalities in the city-region, possibly in partnership with the provincial government, could also work towards building the skills of the staff of the various economic development bodies. Efforts that have shown promise could be expanded. This might include the Gauteng City-Region Academy (GCRA), which was set up to improve skills development and training for staff in the provincial government and Gauteng municipalities, as well as skills for economic and social development and governance. Many staff members of economic development departments at all of levels of government have not received appropriate training. Their positions often require economic expertise, financial knowledge, social transactions and a grounding in heterodox economic development approaches that can align with the often conservative instruments available to economic development agents.

Co-ordinating metropolitan transport

The transit system in the Gauteng city-region is not integrated, and further co-operation at the metropolitan functional level could improve mobility and reduce traffic congestion. Creative solutions for such problems developed in several OECD metropolitan areas could be worth exploring. Momentum is building in South Africa for additional co-ordination in the transport sector. Cape Town is introducing an open systems network that will ensure interoperability between all fare systems in the metropolitan region. Taking advantage of the recently approved national Automated Fare Collection System regulations, Cape Town is working on a transport card that can be charged on a credit card and used for any public transit system in Cape Town (Box 3.8).

Directors of municipal transport agencies within the Gauteng city-region may consider applying this technology in Gauteng and co-ordinating their fare systems. This project could encourage the relevant actors in transport, human settlements, economic development and planning to start working on a coherent agenda to address the economic challenges of the city-region.

Box 3.8. **Cape Town's Automated Fare Collection System**

Cape Town is introducing an "open systems" transit network compliant with standards set by the national government. The tender has been provisionally awarded and the project aims to reduce administrative costs of public transport and improve the passenger experience. Cape Town's Automated Fare Collection (AFC) System has been developed jointly with the central bank (South African Reserve Bank) and all the main retail banks. The system is also EMV compliant (i.e. Eurocard/Mastercard/Visa). In October 2008, the National Department of Transport gazetted draft AFC Regulations under the National Land Transport Transition Act (NLTTA). Once they are promulgated, the regulations will regulate the use of electronic fare systems in public transport. On the basis of these regulations, the following principles are envisaged for the Integrated Rapid Transport AFC System:

- AFC must be made through any Bank-Issued Fare Media;
- AFC must be interoperable through all participating banks;
- clearing and settlement of payment transactions must take place through the National Payment System in accordance with the National Payment System Act of 1998 (Act No. 78 of 1998);
- banked passengers must be able to use Bank Issued Fare Media obtained as a result of their relationship with any participating bank;
- unbanked passengers must be able to obtain prepaid stored value Bank-Issued Fare Media from a participating bank or a third-party card issuer operating in conjunction with the participating bank.

Key advantages include interoperability between all fare systems, in addition to the fact that the national payment system – run by the banks – provides most of the back-office work. It is not necessary to set up a dedicated, closed back office for the Cape Town Bus Rapid Transport electronic payments system.

This policy was made possible by a small number of local but sophisticated banks and financial support from national government, which envisages the Cape Town case as a pilot project for potential national dissemination.

Source: City of Cape Town (2011), Tender No. 24g/2009/10. Contract document for the design, supply, delivery, installation, testing, and commissioning of the IRT fare system, the supply and distribution of fare cards, and the provision of maintenance and other related services Volume 2b (non-returnable document) scope of work, technical requirements and site information.

The transport system in the Gauteng city-region is plagued by the fragmentation of different transport modes. In 1996, the national transport system was effectively unbundled in an attempt to achieve greater efficiency. Roads, rail (separating freight and passenger services), bus services and the regulation of minibus taxi operators were reorganised with a view to streamlining resource flows. However, this unintentionally produced a situation that made it almost impossible to integrate transport systems at the national, provincial, city-region and local level. In practice, the reform encouraged a rush

to apply for subsidies (as in the case of bus service), whether or not a route was profitable.[34] Integrated modal strategies were a casualty of this approach. The other unforeseen outcome of the 1996 reform was that it left intact the "roads-first" culture of the national transport system. Despite an explicit legislative commitment to a more compact and densely built environment, roads were still being planned and built to accommodate the expected increase of road-based vehicles. This has made it difficult to leverage sufficient resources to prioritise and promote public transport, including investing in potential subsidies for the minibus system.

The overlapping roles of different government levels add to the fragmentation in transport. As Table 3.3 makes clear, many government levels have responsibilities for transport, making it necessary to align and co-ordinate them. Many different initiatives are misaligned, and numerous autonomous or semi-autonomous agencies carry out transport functions without reference to the integrated transport plans (ITPs) of municipalities. The South African National Road Agency Limited (SANRAL) constructs and tolls national roads in urban areas without reference to municipal plans. Rail commuter services are in many cases planned and operated without reference to the municipal Public Transport Plan or municipal policies; and bus contracts are in many cases not responsive to changes in patterns of demand or rationalisation proposals suggested in municipal transport plans (Cameron, 2005). Another source of fragmentation is the limited co-ordination of transport between different local authorities, despite the fact that commuting patterns indicate that the Gauteng city-region is a functional transport area (see Chapter 1, and also Krygsman et al., 2009).

Table 3.3. **Function and modal divisions of the transport system in South Africa**

	Planning	Regulation	Operational management	Funding: networks	Funding: vehicles/ rolling stock	Funding: operational
Commuter rail	South African Rail Commuter Corporation (SARCC)	National Department of Transport + National Rail safety regulator	South African Rail Commuter Corporation (SARCC)	South African Rail Commuter Corporation (SARCC) via National Department of Transport		
Buses	Municipality/ transport authority via integrated transport plan (ITP)	Provincial Operating License Board (OLB) + Provincial Department of Transport	Operators	National roads: South African National Road Agency Limited (SANRAL)	Operators	Provincial operational subsidy + farebox revenue
Minibus-taxis	Municipality/ transport authority via integrated transport plan (ITP)	Provincial Operating License Board (OLB) + route associations	Operators	Provincial roads: Provincial Department of Transport Local roads: Municipality + Public Transport Infrastructure and Systems Grant (PTSIG)	Operators + Taxi Recapitalisation Programme	Farebox revenue

Source: Based on Wilkinson, P. (2008), "Reframing Urban Passenger Transport as a Strategic Priority for Developmental Local Government", in M. van Donk et al. (2008), *Consolidating Developmental Local Government: Lessons from the South African Experience*, Isandla Institute, Cape Town, South Africa.

The institutional fragmentation was partially addressed by the promulgation of the National Land Transport Transition Act of 2000. This act made provision for transport authorities that could plan for a more integrated and efficient local transport system, by grouping transport functions into a single, focused institutional structure. These transport authorities would be separate legal entities alongside a municipality, governed and controlled by a governing body of councillors of the municipality. Such transport authorities would only be set up in populous metropolitan areas. The metropolitan municipalities established in 2000 are similar in scale to the areas envisaged as transport authorities. However, only one such transport authority now exists in South Africa, the Ethekwini Transport Authority in the municipality of eThekwini (Durban). The limited use of this institutional vehicle can be explained by the fact that these authorities simply fulfil a "voluntary" joint planning and co-ordination function and are not operating agencies that can mobilise funding, infrastructure planning and operations according to the integrative objectives of the 1996 *White Paper on National Transport Policy*. This weakness remains even after the most recent National Land Transport Act (2009). Meanwhile, few comparable international examples exist of fully modally and functionally integrated agencies whose experience could be instructive. However, a number of modally integrated planning entities with less comprehensive regulatory and funding authority (the *Syndicats de Transports* in the Ile de France and the Dublin Transport Authority, among others) can serve as references.

Efforts have been made for improved co-ordination of transport by the deliberative process during 2005 that resulted in the formulation of a Gauteng Intergovernmental Transport Charter and the short-lived establishment of the Transport Management Authority. This process involved the provincial government and all the local authorities in Gauteng, which made an effort to identify all the problems and to systematically negotiate agreements on how to resolve them. The charter covered critical policy areas, such as planning, infrastructure and regulation, and laid the basis for the initiative to establish a Transport Management Authority in 2008.[35] This new institution aimed to develop norms and standards for integrated public transport across the province, as well as to design integrating mechanisms such as single ticketing facilities. The valuable social capital built up during the charter process, however, quickly eroded. The Transport Management Authority opted for a very high operating structure and seemed to lose its policy footing as the 2009 legislative reform kicked in, which essentially envisaged much greater autonomy for local government to undertake transport planning. This further undermined the incentives for municipal practitioners to participate.

The city-region also needs to co-ordinate with other levels of government to better utilise the existing railway network, despite its high investment costs and governance issues. For example, Johannesburg's 55 train stations could be better utilised. Although the train network could help improve the region's transport, it is not often a topic of discussion in the region, probably because it is a responsibility of the national government. Funding of huge investments to upgrade the existing train network (e.g. improving narrow rails, etc.) is a difficult problem to resolve.

Enhance metropolitan environmental collaboration

Adopting and developing environmental governance tools could address the city-region's challenges in water contamination, unmanageable levels of waste, loss of biodiversity and climate change. Though the following section discusses environmental governance, other policy areas – transport and urban form – also carry environmental

implications. If such policies complement each other, advances could be made in reducing the Gauteng city-region's heavy reliance on energy from fossil fuels and addressing greenhouse gas emissions through metropolitan-wide strategies.

A lack of horizontal collaboration among municipalities within the Gauteng city-region has limited the effectiveness of attempts to combat and adapt to climate change. Carbon-relevant functions, defined economic interchanges, flows of materials and energy, and transport between activities and households in the city's core area and localities overlap across multiple jurisdictions. This requires that city officials engage in the sometimes challenging task of co-operation with other local governments. Inter-municipal co-ordination tools are only infrequently used in the Gauteng city-region, and adaptation policies typically need to be decided and implemented at a regional scale. The lack of institutional fit with carbon-related flows has been identified as a key problem that militates against effective climate change strategies (OECD, 2010b). Although a few examples exist of climate change action plans at the metropolitan level, most notably in London, Hanover and Portland, collaborative inter-urban frameworks for climate change policies and strategies are the exception, rather than the rule (Box 3.9).

Box 3.9. **Cases of metropolitan co-ordination for climate change policies in select OECD urban areas**

London: the creation of the Greater London Authority in 2000 with a directly elected assembly and mayor provided the opportunity to address climate change at the London-wide scale. Planning responsibility allows the mayor to promote the use of on-site renewable energy generation (micro-generation) and combined heat and power (CHP). In the first term of the mayoral mandate, the Greater London Authority formed the London Energy Partnership. This was followed by the introduction of the congestion charge and the approval of policies for addressing the emissions of new development. This momentum led to the development of a Climate Change Action Plan and the creation of the London Climate Agency in 2005 to deliver the policy framework (Bulkeley and Schroeder, 2008).

Hanover: Hanover, a metro-region in Germany of about 4 million inhabitants, benefits from a regional approach to mitigation and adaptation strategies. The Regional Climate Protection Agency (*Klimaschutz-Agentur Region Hannover*) co-ordinates all climate protection activities throughout the region. In the meantime, the regional association of local governments and Hanover County has been transformed into a new authority covering the metro-region, Region Hannover, to which major competences have been transferred.

Portland: Metro Portland (Oregon), serving the city of Portland, 3 counties and 25 cities in the region, is in charge of maintaining the area's urban growth boundary and is responsible for the region's transport system. This is crucial to avoid urban sprawl and a key element in regional mitigation efforts. Portland was the first city in the United States to institute a local climate action. In 2001, Multnomah County followed Oregon's lead and developed a regional strategy (Local Action Plan on Global Warming) for the city and the county. This includes 150 short- and long-term measures, with the goal of reducing CO_2 emissions by 10% by 2010 (Ekelund and Sigurdson, 2007). Portland, like Hanover, is governed by an elected regional body, which may explain the strength of its regional collaboration (OECD, 2006a).

Source: Corfee-Morlot, J., L. Kamal-Chaoui, M.G. Donovan, I. Cochran, A. Robert and P.J. Teasdale (2009), "Cities, Climate Change and Multi-level Governance", *OECD Environmental Working Papers*, No. 14, OECD Publishing, Paris, *www.oecd.org/dataoecd/10/1/44242293.pdf*.

Along with city-region-level planning, municipalities within the Gauteng city-region need to integrate provisions for climate change into the policy process. Municipalities may learn from a wide range of cities that have created institutional mechanisms to prioritise climate-related policies. The City of Zurich, for instance, created a special unit for environmental protection in charge of supervising the city's climate policy, with cross-departmental tasks within the city administration. This special administrative unit is responsible for assessing the impact of every planned development and construction project, and the departments responsible need to account for the results of this assessment. Other responses to integrating climate change in urban governance include the creation of a unit in charge of climate change policy within each climate-relevant department, a climate policy steering group, a climate protection co-ordination group, or an over-arching unit with competence for mainstreaming climate change policy. In San Francisco, the Office of Climate Protection Initiatives is funded to co-ordinate the multiple climate initiatives undertaken by several programmes, to lobby for climate protection legislation at the federal level, and, for example, to work with local private companies to encourage the use of vehicles that run on biodiesel (Corfee-Morlot et al., 2009).

Beyond inter-municipal co-operation in a given geographic area, local governments in the Gauteng city-region could implement resource-pooling strategies to realise savings through co-ordinated action, such as joint procurement for green infrastructure. For example, the Eco-Procurement Service of Vorarlberg in Austria (*ÖkoBeschaffungs-service* – ÖBS4) provides a centralised procurement service for 80 local authorities in the Region of Vorarlberg to procure environmentally sound products. These products include IT equipment, office and sanitary paper, street lighting, cleaning products, copiers, office equipment, fire brigade equipment, school furniture and road salt. Results have shown that it has realised financial savings of up to 30% and a reduction in administrative workload by up to 60%. The service is subsidised by a small commission charged on all procurement actions (EcoProcura, 2006; European Commission, 2008).

Given the high cost of modern waste management facilities, enlarging inter-municipal co-operation on waste collection and disposal could achieve economies of scale. Additional projects could be supported to acquire equipment, build central waste disposal/treatment plants, and develop joint policies for solid waste management and recycling to achieve better environment protection. Agreements could also stipulate that the municipality where a regional facility is located could receive compensation from the others for the social and economic burden it has to support.

In light of declining water quality in the Gauteng city-region, monitoring and evaluation of water-related goals in urban planning is essential. At the municipal level, water is often not addressed as a specific sub-sector, and frequently benchmarks do not exist for evaluating the quantity or quality of fresh water in municipal urban plans. This is a significant oversight, given that water-related landscape features can play a central role in economic diversification in metropolitan regions. The lack of integration of water resource and quality benchmarking within urban planning processes makes it difficult to effectively integrate considerations of land and water use. One good practice to consider in this area is Helsinki's regional environmental agency, which produces and compiles regional data on water quality that informs planners and decision makers across the 745 square kilometres of four municipalities that comprise the Helsinki metro region (OECD, forthcoming).

A transition towards a "water-sensitive" urban development model holds promise for Gauteng. Beyond recognising the need for environmental sustainability, a "water-sensitive cities" model would require reform of the existing contract on water between citizens and governments. Infrastructure, technologies and urban form would reinforce water-sensitive behaviour. Promising initiatives are already under way as seen by the passage of new regulatory measures for open-space planning that require set distances of development from water sources. Such a transition would benefit from more extensive support, and possibly technical assistance, from the national government. For example, the Australian Government encourages its cities to adopt improved water governance through the 2007 National Water Initiative. This called for national guidelines to evaluate options for water-sensitive urban development and a review of the institutional models for achieving integrated planning and management of the urban water cycle (OECD, forthcoming). After the 2010-11 Australian floods, this issue has gained more traction. The Gauteng city-region could benefit from a similar engagement by national authorities to improve water governance.

The Gauteng City-Region Observatory (GCRO), in collaboration with municipal and provincial government agencies, could deepen its role in facilitating inter-municipal co-operation in environmental data management. The emerging data management system that is being developed by the GCRO could be the first step in the harmonisation of data and knowledge management across the Gauteng city-region. Datasets and analysis are needed for all of the key development sectors of the territory, e.g. energy, ecosystem services, water, food security, etc. This could then become the basis for joint working groups on the critical longer term priorities, such as climate change action planning, that require active joint work and supporting systems. The GCRO could become a portal for more sophisticated medium- and long-term environmental planning for the city-region. Similarly, it could greatly assist policy imperatives to benchmark the performance of climate change action in Gauteng with other comparable territories.

3.5. Strengthening participatory governance across the Gauteng city-region

People-centred governance helps build citizenship and foster a layer of social capacity that is essential for addressing the tough nexus of development demands associated with unemployment, long-term poverty and structural exclusion from opportunity. It is critical to improve the functioning of various local democratic instruments, such as the role of ward councillors, community development workers and other instruments to enrol ordinary people in everyday governance. In the following section, background is provided on the aims of ward committees, which were created to increase the participation of local residents in municipal decision making. The ward committee structure will then be critically assessed in light of its mixed results in promoting democratic governance. Alternative public engagement tools will be explored, including participatory budgeting and community participation in slum-upgrading. This commentary focuses primarily on the level of citizen engagement in municipal policy making, which primarily includes municipal-level issues, but also encompasses municipal governmental and civil society participation in the creation of an agenda for the Gauteng city-region.

The structure of local governance in South Africa

Ward committees have been created since 2001 to facilitate participatory and democratic local governance. The rationale for ward committees is to supplement the role of elected councillors by creating a bridge between communities and the political and administrative structures of municipalities. The commitment to participatory local governance is unambiguous in the South African Constitution, which mandates local government to "provide democratic and accountable government for local communities" and "to encourage the involvement of communities and community organisations in the matters of local government" (section 152(1) (a) and (e)). These committees have been set up in the vast majority of wards in municipalities in South Africa. In 2009, there were 3 895 ward committees in South Africa; 423 in Gauteng Province, translating into 24 708 persons per ward. This is much higher than the national average of 12 452 (Co-operative Governance and Traditional Affairs, 2009). According to the Department of Provincial and Local Government (2005), the role of ward committees is to:

- increase the participation of local residents in municipal decision making, as they are a direct and unique link with the council;
- represent local wards without political alignment;
- become involved in matters such as the IDP process, municipal performance management, the annual budget, council projects, and other key activities and programmes, since all these have an impact on local people;
- identify and initiate local projects to improve the lives of people in the ward;
- support the councillor in dispute resolutions, providing information about municipal operations;
- monitor the performance of the municipality and raise issues of concern to the local ward;
- assist with community awareness campaigns, e.g. waste, water and sewage, payment of fees and charges, as members know their local communities and their needs.

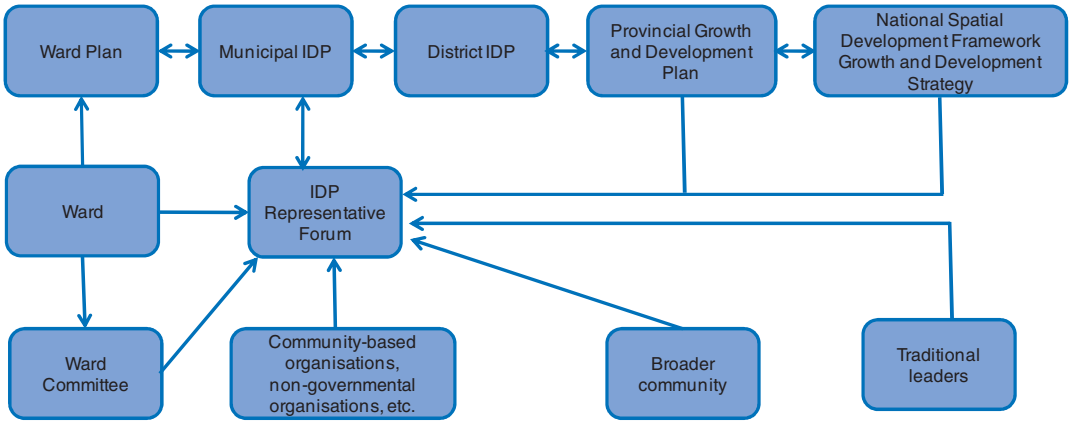
At the heart of the local governance system is the integrated development plan (IDP) enshrined in the Municipal Systems Act of 2000. The IDP provides the primary modality for community interface, a starting point for driving internal institutional reform and the key to intergovernmental co-ordination and alignment (Parnell and Pieterse, 1999). In terms of the Municipal Systems Act, every municipal council must adopt a single, inclusive plan for the development of its municipal area. Such an IDP must reflect:

- the municipal council's vision for the long-term development of the municipality, with special emphasis on the municipality's most critical development and internal transformation needs;
- an assessment of the existing level of development in the municipality, which must include identification of communities that do not have access to basic municipal services;
- the council's development priorities and objectives for its elected term, including its local economic development aims and its internal transformation needs;

- the council's development strategies, which must be aligned with any national or provincial sectoral plans and planning requirements binding on the municipality in terms of legislation;
- a spatial development framework that must include the provision of basic guidelines for a land use management system for the municipality;
- the council's operational strategies;
- applicable disaster management plans;
- a financial plan, which must include a budget projection for at least the next three years; and
- the key performance indicators and performance targets (Republic of South Africa, 2000).

The integrated development plan framework represents a potentially far-reaching transformation of the role of local government in South Africa. It embodies a sophisticated conception of the inter-relationships between developmental intentions, institutional design, intergovernmental (sectoral and financial) alignment and spatial underpinnings of development strategy, amongst other features. Furthermore, the redistributive concern with service backlogs and inequalities are provided for. There is a particularly strong institutional awareness in the framework, as the reference to medium-term financial planning and performance-based management principles indicate. It reflects the government's broader commitment to decentralised service delivery, within a unitary and interdependent intergovernmental system. The act makes it clear that the formulation of an IDP must rest on a meaningful and multi-level participation process to ensure that citizens have a direct say in the outcome. Moreover, it becomes an important tool to enable citizens and interest groups to monitor and assess the performance of the municipality, based on specific targets for development, which are linked to budgets. In theory, these participatory actions should come together in an IDP Forum (Figure 3.1).

Figure 3.1. **Participation institutions**



Note: This draft policy was never formally adopted by the government.

Source: Department of Planning and Local Government (DPLG) (2005), "Draft National Policy Framework for Public Participation", DPLG, Pretoria.

Despite the intentions of these laws, South Africans do not have a high opinion of the performance of municipal government. In response to the Afrobarometer question "How well does the local council allow for citizen participation?" 71.2% of the South African sample responded very or fairly badly, compared to the African average of 69.4%. In response to questions about corruption of local officials, 40.8% of South African respondents answered that most or all of local government officials were corrupt, compared to the African average of 32.0% (Afrobarometer, 2008).[36] The 2009 *Quality of Life Survey* undertaken by the GCRO provides fascinating insights into the levels of satisfaction of citizens across the GCR about the three levels of government. National government scores uniformly better (across race and residential groups) than provincial and local government. Local government consistently scores least well. The survey found that 61% of African respondents were satisfied or very satisfied with national government, followed by 59% of Indians/Asians and 51% of coloureds. White respondents had a much lower opinion of national government, with only 38% satisfied or very satisfied. A roughly similar pattern was found when respondents were asked about provincial government, although Indians/Asians (57% satisfied or very satisfied) were happier than Africans (at 52%) and "coloureds" (50%). Whites were again the least satisfied, with 36% satisfied or very satisfied. However, the results for municipal government are remarkable: only 41% of Africans were satisfied or very satisfied with their municipality, compared to 51% for Indians/Asians, 37% for "coloureds" and 38% for whites (Gauteng City-Region Observatory, 2010b).

Revising ward-based committees and improving citizen engagement

In light of the general consensus that democratic engagement has not yet been fully realised, there is room to revise the guidelines of ward-based committees. The Department of Co-operative Governance (COG) is refining guidelines that will be issued in 2011 to invigorate the ward system. This follows from several critiques and the chequered history of ward committees. There is a generalised impression that ward committees have struggled to come into their own and live up to the intentions in the legislation and various further regulations that stipulate how best these structures should function.[37] The reasons vary, but are usefully summarised below:

1. Some ward committees do not have the required number of members and cannot achieve a quorum at meetings, which impacts negatively on their efficacy.
2. The chairpersons (ward councillors) can stymie progress because meetings cannot continue without them.
3. Poor working relationships prevail between the ward councillor and the ward committee, with ward councillors sometimes feeling threatened by the perceived political power of the committees. This is compounded when the committee is loaded with "deployees" of the local party political branch and organisational conflicts overly interfere with the functioning of the committee.
4. A lack of interest in participating in ward committees, specifically amongst members of the white population group.
5. A lack of incentives for ward committee members, in the form of reimbursement for out-of-pocket expenses or a small stipend (this is particularly problematic because community development workers are paid a stipend).[38]

6. Ward committees receive insufficient capacity-building training, as well as administrative and other resources, to enable them to function effectively. And,
7. Wards are too large in territorial terms, especially in rural areas, to become a viable mechanism for democratic engagement (Smith and Devisser, 2009).[39]

Given these challenges, the national government may seek to reform the guidelines on the drawing of ward-based committee boundaries to make wards more appropriate for planning. In the process of deciding how ward boundaries are drawn, the Electoral Commission of South Africa is not concerned with how a particular community can be contained within a ward, nor with the nature of settlement and dwelling types that fit within or span across a ward's boundaries, nor with the spatial patterns of development advantage and disadvantage given by the layout of infrastructure networks, proximity to urban amenity and so on. The overriding, indeed the only, consideration is ensuring that the number of residents to be represented by the councillor to be elected in any ward is roughly the same as the number to be represented in the next ward.[40] Whilst wards can be fairly large in some areas, they are, fundamentally, designed as units of "electoral representation", not "developmental-units". Due to the fact that the metro and local councils are structured into thematic, rather than geographic committees, "nowhere in Council does the ward councillor actually represent his/her ward" (Bénit-Gbaffou, 2008).

Given these challenges, that national government may seek to inform national guidelines through pilot projects in ward-based IDP planning and participatory budgeting in the Gauteng city-region. Already the City of Johannesburg, for example, has been experimenting with ward-based IDP planning for the past few years. Even though the results to date have been disappointing, the attempts reflect a genuine desire to figure out how to make participatory and representative democratic instruments work more effectively. Second, ward-based governance could be improved by linking ward-based councils up with some participatory budgetary powers (Shah, 2007; UN-Habitat and Municipal Development Partnership for Eastern and Southern Africa, 2008; UN-Habitat, 2009). Derived in part from the experience of Porto Alegre, Brazil, participatory budgeting has been implemented in a number of cities around the world, among them the eThekwini Metropolitan Municipality in KwaZulu-Natal (Smith, 2004). Participatory budgeting has emerged throughout Europe and North America (Box 3.10). These practices could be adaptable to the Gauteng city-region provided that they are complemented by monitoring systems to track efficacy.

Democratic citizenship in the Gauteng city-region could also be strengthened through training of community activists and a reorientation to hold local councillors more accountable. Leaders in the Gauteng city-region could explore the establishment of a Citizenship/Civic Academy for community activists who participate in any number of government-community interface organisations. Such an academy would seek to institute large-scale training and socialisation institutions for community members. It would to equip them with organising and activist skills to make government programmes work better, exercise oversight and drive autonomy and autonomous action. A basic institutional model would be to create coalitions of NGOs and CBOs to develop the curriculum and run the training, with quality control and accreditation mediated by educational and other oversight institutions. Such social infrastructure investments could make a massive impact on reducing the risk of investment loss in programmes in poor and working-class areas. Indeed, only 15.5% of South Africans perceive that voters have the responsibility to hold councillors accountable, far below the African average of 43.8%. Likewise, 26.7% of South Africans believe that the political party of the

councillors should hold them accountable, a number that is more than twice the African average of 11.7%.[41]

Box 3.10. **Participatory budgeting in select OECD municipalities in Europe and North America**

Broadly speaking, participatory budgeting allows the participation of non-elected citizens in the conception and/or allocation of public finances. Five criteria need to be met: *i)* the financial and/or budgetary dimension must be discussed; participatory budgeting involves dealing with the problem of limited resources; *ii)* the city level has to be involved, or a (decentralised) district with an elected body and some power over administration (the neighbourhood level is not enough); *iii)* it has to be a repeated process (one meeting or one referendum on financial issues does not constitute an example of participatory budgeting); *iv)* the process must include some form of public deliberation within the framework of specific meetings/forums (the opening of administrative meetings or classical representative instances to citizens is not participatory budgeting); *v)* some accountability on the output is required.

Toronto, Canada: since 2001, the Toronto Community Housing Corporation (TCHC) has used a participatory budgeting process to involve tenants in budget decision making, as part of its Tenant Participation System. Originally called Community-Based Business Planning, the budgeting process has allowed tenants to decide how to spend CAN 9 million per year, or 13% of the TCHC's capital budget. The TCHC is the largest social housing provider in Canada and second largest in North America, with 164 000 tenants housed in over 350 high- and low-rise apartment buildings and 800 houses and duplexes. With an average income of CAN 15 400, TCHC residents are generally low-income individuals and families. Many residents are new immigrants, elderly, disabled or single-parent families, which are some of the most marginalised populations in Toronto.

Morsang-sur-Orge, France: this municipality is a middle-class suburban city with a population of around 19 500. In 1998, the administration created eight neighbourhood councils open to all residents. Elected representatives also participate in order to discuss proposals with the community, but they do not have voting rights. Each council was allocated EUR 60 000 for local projects and has full autonomy to decide how these resources are spent. Together, the councils control 20% of the city's investment budget. In 2002, the municipality expanded popular participation by introducing five thematic workshops at which residents and politicians meet to discuss projects for the municipal budget. The results are then presented to the municipal council.

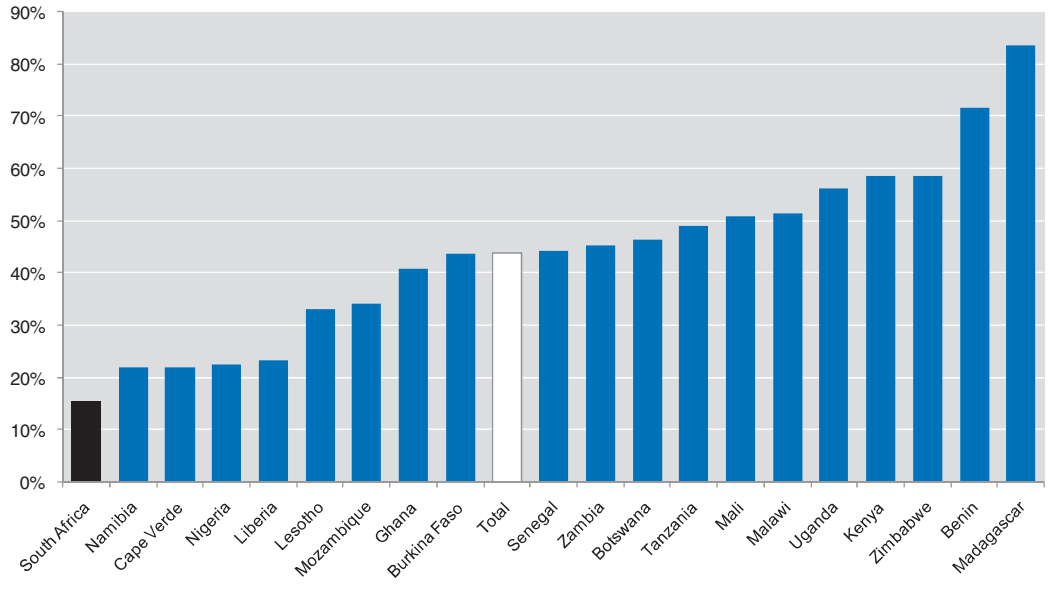
Berlin-Lichtenberg, Germany: Berlin-Lichtenberg is a borough in Eastern Berlin, with 251 000 residents, composed of 13 districts. The borough yearly allocates the sum of EUR 31 million to implement citizens' preferences and suggestions. The Participatory Budgeting Project allows citizens to discuss and express their preferences with regards to discretionary fields, including support of public health, business counselling, planning parks and free space, libraries, general support for children and adolescents, cultural services of public institutions, schools of music, voluntary services by senior citizens, care of senior citizens, sports, care of street greenery, care of street trees, care of parks, care of playgrounds, and schools for continuing education.

Box 3.10. **Participatory budgeting in select OECD municipalities in Europe and North America** *(cont'd)*

Seville, Spain: the main objective of the participatory budgeting in Seville is to promote citizens' direct participation in the design of the city's budget. Inspired by the example of Porto Alegre in Brazil, participatory budgeting was introduced in Seville in 2004. The city of 700 000 people is divided into 21 assemblies, which were attended by around 9 000 people in 2006. The assemblies have their own constitution, known as *autorreglamento*, which was drafted by a commission of delegates elected by the assemblies. Each year the council decides the amount that will be allocated by the assemblies, but at least 50% of the city's budget for local districts is within their control. Currently, the city council's departments of public works, sport, youth, education, culture, environment, health and gender have opted to join. The assemblies choose delegates to monitor the execution of policies; they are accountable to the assemblies from which they were elected. Participatory budgeting has led to the construction of a network of cycle lanes across the city, as well as several swimming pools and sports grounds. Urban renewal programmes, such as the construction of new drains and pavements, have also been undertaken in poorer neighbourhoods and priorities agreed for repairs in schools.

Source: Sintomer, Y. et al. (2008), "Participatory Budgeting in Europe: Potentials and Challenges", *International Journal of Urban and Regional Research*, 32(1): 164-178; Lerner, L. and E. van Wagner (2006), "Participatory Budgeting in Canada: Democratic Innovations in Strategic Spaces", Transnational Institute, *www.linesofflight.net/work/pb_in_canada.pdf*; Herzberg, C. et al. (2008), *Les budgets participatifs en Europe: Des services publics au service du public*, La Découverte, Paris; Participedia (2010), "Participatory Budgeting in Berlin-Lichtenberg", *www.participedia.net/wiki/Participatory_Budgeting_in_Berlin-Lichtenberg*; Participatory Budgeting Unit (n.d.), "Participatory Budgets in Europe", *www.participatorybudgeting.org.uk/documents/Participatory%20Budgets%20in%20Europe.pdf*; Transnational Institute (2007), "Participatory Budgeting in Seville", *www.tni.org/article/participatory-budgeting-seville*.

Figure 3.2. **Responsibility of voters in holding local councillors accountable: South Africa and African countries, 2008**



Source: Afrobarometer (2008), "Afrobarometer Online Data Analysis", adapted by OECD.

Additional programmes could be developed to promote citizen engagement during upgrading activities, given Gauteng's large housing deficits. If properly involved, community members could enhance project feasibility, open channels for communication, and improve targeting through their knowledge of "beneficiary communities and the needs of the various groups that comprise them" (Imparato and Ruster, 2003). Latin America offers several models that may have resonance in the Gauteng city-region, including the FUPROVI's Habitat Popular Urbano Programme (Urban Low-Income Housing Programme), in San José, Costa Rica, where community management of mutual-help construction is made possible by intense capacity-building and socio-technical support.[42]

Brazil offers innovative models for the Gauteng city-region to consider when developing partnerships between beneficiary communities and city agencies involved in upgrading and land titling. For example, Rio de Janeiro's Working Group on the Regularisation of Irregular Subdivisions (*Núcleo de Regularização de Loteamentos*, NRL), sponsors bimonthly meetings where residents ask questions and demand resolution of their land claims to a panel of representatives from six different city agencies. Such a model facilitated a higher degree of inclusion of stakeholders and mutual learning that led to the formation of new strategies. Likewise, in Recife, community management groups known as Commissions of Upgrading and Legalisation (*Comissões de Urbanização e Legalização*, COMULS) co-ordinate legalisation projects, mediate between the community and government agencies, encourage the participation of the community in regularisation processes, resolve conflicts and clarify legal questions. COMULS are composed of five members from a wide spectrum of interests, including one representative from the Planning Department, the municipal or state agency responsible for the technical aspects of the project, a non-governmental organisation chosen by the residents, and two leaders from the neighbourhood as selected by the residents' association (Donovan, 2007).[43]

Beyond engagement in the discussion of IDPs, more effective public engagement tools are required to facilitate the involvement of main economic actors, as is the case in some OECD cities. Although business organisations are involved in national policy making, via the National Economic Development and Labour Council (NEDLAC), business is not structurally and institutionally involved in policy making in the Gauteng city-region.[44] Considering the key role that business can play in realising many of the metropolitan economic development goals, many cities have chosen to include business representatives in the formulation of their economic strategies. In Copenhagen, business is involved in strategic metropolitan policy making via the Growth Forum for the Capital Region, in which trade unions, academia and regional and local governments are also represented. This Growth Forum developed a Regional Business Strategy for the region in 2007, in which the ambition was expressed for Copenhagen to be Northern Europe's most attractive metropolis for living, study, work, doing business and visits. The regional Growth Forum initiatives are co-ordinated with national initiatives via the Danish Growth Council (OECD, 2009b).

Conclusion

This chapter's review of governance arrangements and dynamics in the Gauteng city-region found the state of democratic governance to be noteworthy in light of the transitional pressures that former authoritarian states go through. The South African Government at all levels has demonstrated a clear commitment to the maintenance and

consolidation of various fundamental democratic institutions, such as regular elections, legislation to ensure access to information, imperatives for citizen input into policy formulation, tolerance of and engagement with autonomous civil society organisations, and respect for an independent judiciary. However, substantial governance challenges come to the fore in the government's attempts to combine democratic institutions with a developmental state agenda as per the South Asian models. Indeed, in recent years, leaders in South Africa have been particularly impressed by the achievements of China, South Korea, Malaysia and Singapore. This chapter highlighted the introduction of new planning institutions, most notably the National Planning Commission in the Presidency and the Gauteng Planning Commission (GPC) in Gauteng. It also stressed how the proliferation of autonomous democratic grassroots formations is beneficial for building citizenship and fostering a layer of social capacity that is essential for addressing the tough nexus of development demands associated with unemployment, long-term poverty and structural exclusion from opportunity. Resolving governance challenges in the Gauteng city-region will ultimately help the region attain its goals of inclusiveness, global outreach and more resilient economic development.

Box 3.11. **Summary of city-region governance recommendations for the Gauteng city-region**

Fostering intergovernmental collaboration for improved public service delivery

- Maintain the strategic importance of municipalities' integrated development plans (IDPs) in providing a vision based on a deliberative process that cuts across sectoral departments, civil society and the private sector.
- Local governments in the Gauteng city-region could implement resource-pooling strategies to realise savings through co-ordinated action, such as joint procurement for green infrastructure.
- Develop a more robust and empirically grounded understanding of the drivers of intergovernmental relations misalignment.

Reforming national housing policy to confront spatial inequality

- Prioritise the upgrading of informal settlements, citizen engagement during upgrading activities, and a resolution of concurrent mandates shared between provincial and municipal governments over land management.
- Support the government's objective to set aside well-located public land for low-income housing; clarify concurrent mandates shared between provincial and municipal governments over land management.
- Provide technical assistance in evaluating compliance with municipal housing, zoning and urban plans.

Harnessing financial tools to expand infrastructure and economic opportunity

- Introduce "smart financing" mechanisms that support revenue generation and densification.
- Establish an "infrastructure barometer" to develop a fine-grained and independent understanding of the Gauteng city-region's network infrastructure systems.

Box 3.11. **Summary of city-region governance recommendations for the Gauteng city-region** *(cont'd)*

Embedding the city-region concept into policy

- Co-ordination is essential in the Gauteng city-region to ensure that sectoral policies are coherent in a functional city-region that spills over multiple jurisdictions. Advancing the city-region vision will require political commitment and new forms of "light" co-operation, such as strategic planning partnerships.
- Policy makers could target two critical areas to transform the city-region vision into a practical reality:
  - **metropolitan transport:** ensure inter-operability between all public transit fare systems in the city-region and utilise the Gautrain system as a platform to build co-operation in the Gauteng city-region;
  - **environmental policy-making:** enlarge inter-municipal co-operation on waste collection and disposal, develop an intergovernmental approach to climate change action planning, and strengthen regional co-operation on environmental data collection and management, particularly with respect to assessing natural resource constraints and metabolic flows.

Strengthen participatory governance across the Gauteng city-region

- Consider reforming the guidelines on the drawing of ward-based committee boundaries to make wards more appropriate for citizen engagement and planning.
- Additional programmes could be developed to promote citizen engagement during upgrading activities, given Gauteng's large housing deficits. This could enhance project feasibility and open channels for communication.
- Experiment with alternative public engagement tools, such as participatory budgeting.

Notes

1. This overhaul period was marked by a sweeping reorganisation and demarcation of local authorities in 2000, when the number of local authorities was reduced from 843 to 284 nationwide (Municipal Demarcation Board, 2000). For instance, Johannesburg's local governance was fragmented by apartheid into 13 separate authorities presided over by racially separate local governments, with their own fiscal, legal, administrative, and planning systems. Today they constitute one metropolitan authority.

2. In urban areas, the Black Local Authorities (BLAs) were created by the apartheid state in 1982 as part of a political attempt to stabilise and control the urban African population.

3. There is a distinct trend towards greater decentralisation in many OECD member countries. In the ten years between 1995 and 2006, the share of sub-national expenditure in total government expenditure grew from 31% to 33% for OECD member countries. This increase in sub-national expenditures reflects both the allocation of new responsibilities to the sub-national level and increasing costs in local public service delivery (OECD, 2009c).

4. Therefore some departments exist only at national level because they pertain to issues of national concern, such as Defence, Foreign Affairs, Water and Forestry, Science and Technology, Mineral and Energy, Public Enterprises and Home Affairs. Other departments have national and provincial departments because they deal with direct provincial service delivery, such as Education, Housing, Health and Social Development.

5. In 2010, the Gauteng Provincial Parliament held the following political distribution: African National Congress (47 members), African Christian Democratic Party (1), Congress of the People (6), Democratic Alliance (16), Independent Democrats (1), Inkatha Freedom Party (1), Vryheidsfront Plus (1).

6. The seven strategic priorities for the Gauteng Provincial Government are: *i)* creating decent work and building a growing, inclusive economy; *ii)* promoting quality education and skills development; *iii)* better health care for all; *iv)* stimulating rural development and food security; *v)* intensifying the fight against crime and corruption; *vi)* building cohesive and sustainable communities; and *vii)* strengthening the developmental state and good governance.

7. The *White Paper on Local Government* (1998) defines developmental local government as "local government committed to working with citizens and groups within the community to find sustainable ways to meet their social, economic and material needs and improve the quality of their lives" (quoted in Jensen, 2004).

8. To remedy this situation, KwaZulu-Natal passed the Planning and Development Act (2010), which establishes a precedent for shifting functions and responsibilities with all statutory planning procedures to municipalities.

9. For example, provincial and local government have collaborated in targeting government efforts to rehabilitate social and economic infrastructure in 20 prioritised townships identified across Gauteng, with a view to improving public services and stimulating local economies. Plans to upgrade inner-city areas and stimulate economic development in Gauteng's less developed sub-regions of Germiston, Vereeniging and Krugersdorp are also intergovernmental initiatives. There have also been notable examples of co-operation across the spheres to design and build large new housing developments, such as the 5 000-unit, mixed-type Cosmo City settlement in northern Johannesburg, as well as large infrastructure developments, such as new regional wastewater facility in Sedibeng, in the south of the region.

10. The provincial government and municipalities have also worked closely on upgrading strategies for various dormitory township areas. The best-known is the multi-year Alexandra Renewal Programme, which seeks to de-densify and upgrade infrastructure in this very crowded and poorly serviced area close to the region's key financial node of Sandton. Others, such as the Evaton and Bekkersdal Urban Renewal Projects, build on the Alexandra experience of combining provincial and local government budgets and development experience in trying to regenerate these underdeveloped areas.

11. The role of each Implementation Forum is to report on progress to the national Cabinet, identify and resolve blockages, and regularly revise the delivery agreements on the basis of evaluation. While the practice of the Implementation Forums is still very recent, they are set up to ensure intergovernmental co-operation in achieving particular outcomes, and there is a strong emphasis "on the need to react to lessons learnt in implementation" by adding or changing targets or adjusting implementation schedules.

12. According to Luyando Qomfo at the Institute for Democracy in Africa (Idasa), the responsibilities of local government are becoming more complex with increasing decentralisation: "The major concern with regard to the Constitution is the lack of clear definitions of local government functions. Further concerns stem from the inconsistency of allocations of functions, which results in insufficient attention being paid to capacity and financing" (Qomfo, 2005).

13. The paucity of intergovernmental co-operation in Cape Town has produced project delays, especially in land development, where inconsistent regulations and inter-jurisdictional conflicts have increased fees and transaction costs. For example, the N2 Gateway project, which intended to demonstrate an intergovernmental community consultation for rapid, high-density housing delivery, has been bogged down in problems ranging from delays, inadequate community consultation, cost overruns, inadequate construction materials and contestation between the City of Cape Town and the National Housing Department over defining the beneficiaries of this project (OECD, 2008).

14. Caution is warranted when pursuing metropolitan co-ordination, however. Hawkins and Ihrke (1999) analysed 30 empirical studies and concluded that 21 supported the hypothesis that inter-municipal competition lowers the cost of public services or does not increase expenditures. Nine studies, however, concluded that inter-municipal competition increases costs or has other damaging effects.

15. The Urban Settlement Development Grant is comprised of funds top-sliced from the Human Settlement Development Grant (historically for provincial allocations) as well as funding from National Treasury and the old Municipal Infrastructure Grant (Thring, 2011).

16. It allocates to the district government a supervisory role over water-quality monitoring, food control, waste management, health surveillance of premises, environmental pollution control and disposal of the dead. In so doing, it produces overlaps with the Municipal Structure Act, which ascribes the following functions to local municipalities: "potable water supply systems", "licensing and control of undertakings that sell food to the public", "solid waste disposal sites", "markets", "air pollution", "noise pollution", "refuse removal", "facilities for the accommodation, care and burial of animals" and "local cemeteries" (Steytler and Fessha, 2005, cited in OECD, 2008).

17. However, at a national policy workshop convened by the National Planning Commission on 5 August 2010, Minister Trevor Manuel explicitly raised the problems of unclear powers and functions. See: *www.thepresidency.gov.za/pebble.asp?relid=1745* (accessed on 15 December 2010). It remains unclear whether the National Planning Commission will have any influence over national departments.

18. This has been achieved mainly through the development of multi-year intergovernmental plans with set indicators, targets as well as outputs and activities for each of the key outcome areas. These form the basis for the annual intergovernmental Programme of Action for the province as well as budgetary allocations. The annual programme outlines the main high-level commitments involving both provincial and local government in the province and sets targets that are monitored on a quarterly basis.

19. At the Extended Executive Council Lekgotla, held from 9-11 September 2009, the Premier was mandated to lead an interactive process between the provincial and local spheres of government to design a tailor-made intergovernmental relations framework for Gauteng Province.

20. The financial year, which drives the planning cycles, runs from 1 April to 31 March for the national and provincial government, but from 1 July to 30 June at the local government level. Provincial and municipal public officials represent two different public services and have no legal obligation to synchronise their cycles or co-ordinate their budgetary processes.

21. Basically, each of these sectoral forums simply conduct information exchange, to some extent joint planning and most co-ordination between the provincial and local government levels.

22. This interpretation is consistent with the Local Government Turnaround Strategy (2009), which notes, "the essence of an IDP [is that it is] an expression of all of government's work within a municipal area." The national Local Government Turnaround Strategy was adopted by the national Cabinet in 2009 and was based on an assessment of the state of local government, which was deliberated at a national local government *indaba* (conference) in October 2009.

23. Local government makes inputs into the provincial Programme of Action, including through the mayors and municipal managers who participate in the EXCO Lekgotla and make their own presentations at the EXCO Lekgotla.

24. Various studies of this kind have been carried out, including the review of powers and functions in the province, audit of IGR structures, review of governance, etc. which have been evidence based. More work, however, needs to be done on documenting and reviewing intergovernmental practice, identifying best practice and

mainstreaming such practice in relation to key IG projects such as the World Cup, urban renewal projects, etc.

25. In 2010, the Constitutional Court made a judgement that the Development Facilitation Act of 1995 was wrong to allow provincial governments to override municipalities' land-use decisions. It blamed the absence of national legislation for the confusion and gave national government 24 months (expiring in May 2012) to resolve the absence of national legislation. The Presidency and the Department of Rural Development and Land Reform are presently working on new legislation.

26. At the same time, it would be difficult to end these subsidies, considering possible negative distributional effects.

27. In 1956, Fair et al. compiled a "Planning Survey of the Southern Transvaal" for the National Resource Development Council. In 1963, a conference on the "Problems of Regional Development and Planning in the Southern Transvaal" was held, where papers, subsequently published as proceedings, were presented on topics such as "The Southern Transvaal Seen in the Framework of Regional Planning" and "Transportation Problems in the Southern Transvaal". By the early 1970's, nomenclature had shifted slightly, and reference to the Southern Transvaal had been replaced by the more precise "Pretoria/ Witwatersrand/Vereeniging" (PWV) complex, as in a 1974 report for the Department of Planning and Environment on "Proposals for a Guide Plan for the Pretoria/Witwatersrand/Vereeniging Complex". Similarly, in 1977, VKE International Consulting Engineers released results of the first *PWV Transport Study*, with a base year of 1975, subsequently updated in 1985 and 1991. In 1981, a Spatial Development Strategy for the PWV Complex was complied for the Office of the Prime Minister. See Fair et al. (1956); Farquharson (1963); Verburgh (1963); Department of Planning and the Environment (1974); Du Plessis (1981), cited in Gauteng City-Region Observatory (2010a).

28. A series of consultations with civil society sectors was held on the Gauteng city-region concept with a view to obtaining feedback and contributions from civil society. This was informed by the understanding that the success of the GCR required the further development of a spatial coalition, including civil society partners. Sectoral consultations were held with trade unions, business representatives, representatives of organisations of women, youth, students and people with disabilities, faith-based institutions, the media, academia and research institutions. Members of the diplomatic corps were also briefed.

29. The South African Cities Network is comprised of the nine largest city governments, with the goal of exchanging information, experience and best practices on urban development and city management. According to the SACN website, it is an initiative of the Minister for Provincial and Local Government and nine city municipalities, in partnership with the South African Local Government Association (SALGA). The SACN was established in 2003. Its State of the South African Cities Report (2004) note:

Johannesburg, Ekurhuleni and Tshwane have been defined as separate cities. But they form part of a much larger urban system that now spans across much of Gauteng. Together with two other key centres that are not SACN cities – Mogale City (Krugersdorp) to the west and Emfuleni (Vereeniging-Vanderbijlpark) to the south, these three cities constitute a virtually continuous urban 'extent' of some 8.6 million people. […] There are many reasons why this 'conurbation' should not be treated as a single city. But it is important to recognise that the Gauteng cities comprise a 'polycentric urban region' presenting unique opportunities and challenges. On the

opportunity side is the fact that urban regions, rather than individual cities, are increasingly being seen as the locus of strategies for promoting global competitiveness. On the risk side is the potentially crippling dysfunctionality of an increasingly crowded urban region where transport, environmental control, land-use planning, economic development strategies, and household infrastructure networks cannot be properly co-ordinated.

30. The end-of-term report of the City of Johannesburg, for its 2000-06 term of office, noted the preliminary work that had been done, between provincial and local government in partnership, and confirmed:

Motivated by the principle 'co-operate-internally-to-compete-externally' the municipalities and provincial government have come together to look at what can concretely be done to collaboratively build a globally competitive urban region. The partners will work to develop a common vision and strategy, and use the Global City Region concept as a platform for tackling thorny intergovernmental challenges such as common approach to building nodes and development corridors (City of Johannesburg, 2006).

Similarly, the City's 2005-06 Integrated Development Plan (IDP) and its 2006-11 Five-Year IDP both made clear commitments to continue to build the global city-region idea. Likewise, the most recent IDP of the City of Tshwane for 2010-11 reflects a long-term vision for the GCR to 2055.

31. The Wendy Ovens and Associates & Resolve Group (2007) study does not recommend a particular form of metropolitan governance but rather underscores that it is the National Demarcation Board that makes determinations regarding what constitutes a metropolitan area. The study suggests that since this body applies its criteria very strictly across all of South Africa's territory, it is unlikely to change its approach and regard the functional city-region as a metropolitan area. However, the study does suggest that further work on metropolitan governance in the Gauteng city-region needs to explore what the scope for such change could be.

32. The Lyons Urban Region contains 2.6 million residents and brings together different levels of the French administration: four *départements*, 700 municipalities, as well as a number of inter-municipal bodies (50 associations of municipalities, or *communautés de communes*, the Urban Community of Lyons – also called Greater Lyons), which includes 55 municipalities, and the Agglomeration Community of Saint-Étienne, which includes 43 municipalities) (OECD, 2006a).

33. The Gauteng Planning Commission will co-ordinate intergovernmental relations towards the full implementation of the provincial Programme of Action. The Gauteng Provincial Government (2010) describes its role thus:

The purpose of establishing the Commission is to facilitate short-, medium- and long-term planning and embark upon a process to develop a shared vision with the people of Gauteng. The work of the Commission in the context of the Extended Executive Council Lekgotla process and the development of the provincial intergovernmental Programme of Action and strategic outcomes assists and complements the province in building a developmental state which has the capacity to effect socio-economic transformation through clear and strategic integrated programmes and plans.

34. The biggest problem with this approach was that it removed strategic capacity to formalise and mainstream the vibrant minibus industry, which managed to out-compete rail and bus services, especially in Gauteng. By 2009, 41% of the

population used taxis and an equal proportion used private vehicles (41%), while only 4% used rail and 4% buses.

35. Other critical policy areas dealt with were public transport, road space management, freight and logistics.

36. Note that the African averages include South Africa. The South African and African samples sizes for "Q60c. How well local council allowing citizen participation" are 1 086 and 19 977, respectively. The South African and African samples sizes for "Q50c. Corruption: local government councillors" are 1 040 and 19 778, respectively (Afrobarometer, 2008).

37. For example, the government published the "Guidelines for the Establishment and Operationalisation of Ward Committees" in 2005. This was further bolstered by the Local Government Laws Amendment Act of 2008, which stipulates provisions on the term of office of ward committees, the need for adequate financial support from municipalities to allow committee members to be reimbursed and support for their citizen contributions.

38. Reliable informants close to the process of developing a formal policy on the new ward participatory model as required in terms of the outcome requirements of the department, indicate that this is likely to be addressed.

39. This is not an exhaustive list and also addresses mainly the institutional and practical constraints facing ward committees. Bénit-Gbaffou (2008, 2010) has carried out longer term ongoing ethnographic research on various ward committees in Johannesburg and she generates important results about the political cultures that surround these structures. Her findings are that ward councillors feel conflicted about their position. Given their proximity to communities, they are the visible face of local government and are often expected to absorb the frustration and anger that communities feel about a perceived lack of service delivery. Yet they are generally powerless to influence council, let alone the executive or officials. Bénit-Gbaffou suggests that due to a lack of powers and resources at the ward level, ward councillors and ward committees are being set up for failure. They simply cannot meet the expectations that their presence generates.

40. At each local government election municipal wards get redrawn. The process starts with the minister of Co-operative Government and Traditional Affairs setting the number of councillors for each municipality. On the basis of a 50/50 split in ward/proportional representative councillors, this in turn sets the number of wards in each municipality. Each ward then needs to be defined so that there is a rough equivalence in the number of voters per ward councillor (in denser parts of Gauteng typically 12 000-15 000). The Municipal Demarcation Board undertakes the ward delimitation process and hands over the final result to municipalities and the Independent Electoral Commission so that detailed planning for elections can be done. This process has just been completed again for local government elections scheduled in the first part of 2011.

41. The variable is "Q73b. Who responsible: local councilors do jobs" and the question is "Who should be responsible for: [Read out options] making sure that, once elected, local government councillors do their jobs?" The options are: not asked, missing, the president/executive, the Parliament/local council, their political party, the voters, no one, and don't know.

42. Imparato and Ruster (2003) provide descriptions of the following projects: PROFAVELA programme, Belo Horizonte, Brazil; AOISPEM programme, Cali, Colombia; Catuche Social Consortium, Caracas, Venezuela; community upgrading programmes, Ciudad Juárez, Mexico; El Mezquital project, Guatemala City, Guatemala; PRIMED programme, Medellín, Colombia; PREZEIS programme, Recife, Brazil; Favela-Bairro programme, Rio de Janeiro, Brazil; Novos Alagados project, Salvador, Bahia, Brazil; and the *mutirão* programmes in São Paulo, Brazil.

43. Souza (2007) notes that there are 35 active COMUL groups in Recife's 66 ZEIS Areas.

44. Also see documents from the Gauteng Advisory Council of the Gauteng Planning Commission.

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