

# Spatial Change as Drivers of Risk and Vulnerability in South Africa: Spatial trends in the 3 metropolitan cities of Gauteng

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5 July 2016

Planning Africa Conference 2016



# Introduction

- Urban spatial change trends manifest most noticeably in Gauteng
- This not only confirms perceptions about metros as increasingly being the spaces where the future of South Africa's youth will be determined, but also once again rings the alarm bells for urgent, focused and innovative government support to address urban risks and service delivery implications
- In this paper we explore spatial patterns of change as drivers of risk and vulnerability in Tshwane, Johannesburg and Ekurhuleni

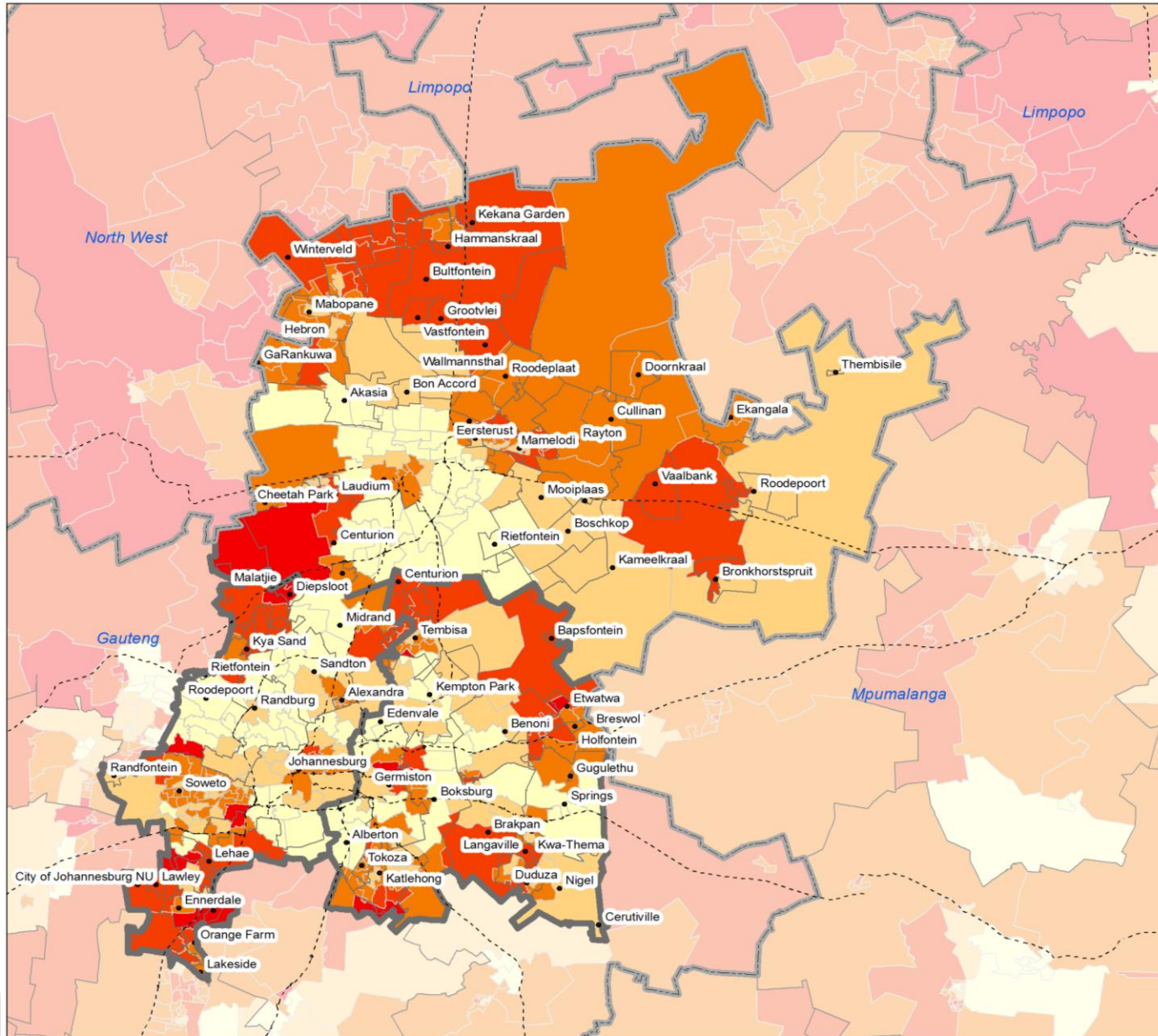
# Spatial changes as drivers of risk and vulnerability



# Spatial trends analysis in 3 Gauteng metros

- Spatial patterns of social vulnerability
  - Social vulnerability index based on 14 indicators
- Areas characterised by significant population densities and increased population concentration
  - Change in built-up settlement footprint
  - Current population concentrations
  - Number of informal structures
- Areas characterised by an increased number of people living in poverty and areas where unemployment has increased
  - Change in numbers of lowest income group
  - Change in percentage of unemployed
- Trends highlighting decrease in household size and high levels of mobility, and areas characterised by a large proportion of young adults
  - Change in number of- and size of households
  - Population movement trends
  - Percentage of population aged 16-35 years
- Trends highlighting increased and decreased levels of access to services and opportunities
  - Change in access to good services
  - Combined economic production and population change

# Socially vulnerable population on the edge



## Legend

- Roads
  - Province
  - 9 Cities
  - Main place name
  - Main places
- Social Vulnerability 14class**
- Low vulnerability
  - High vulnerability

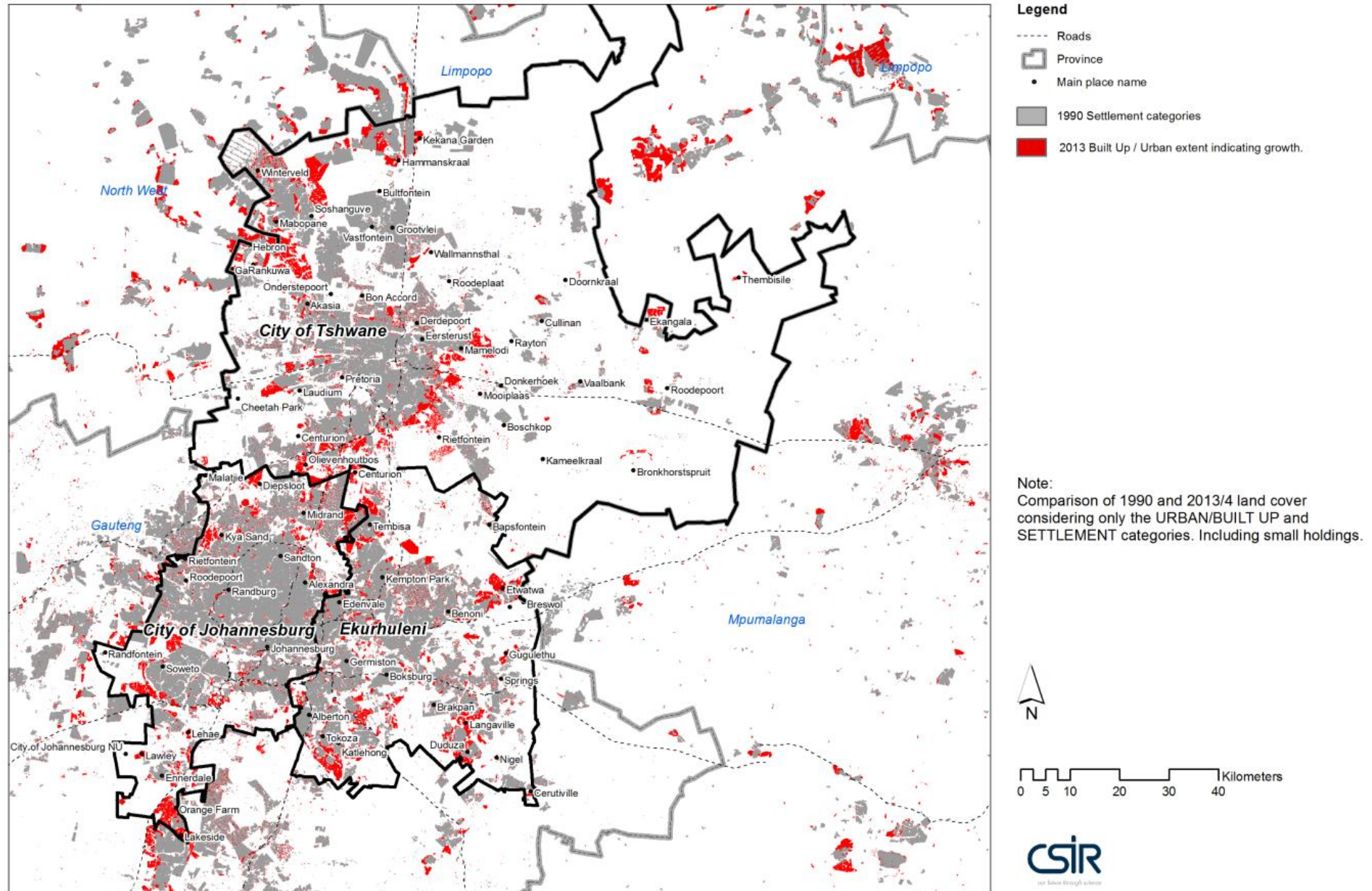


## NOTE:

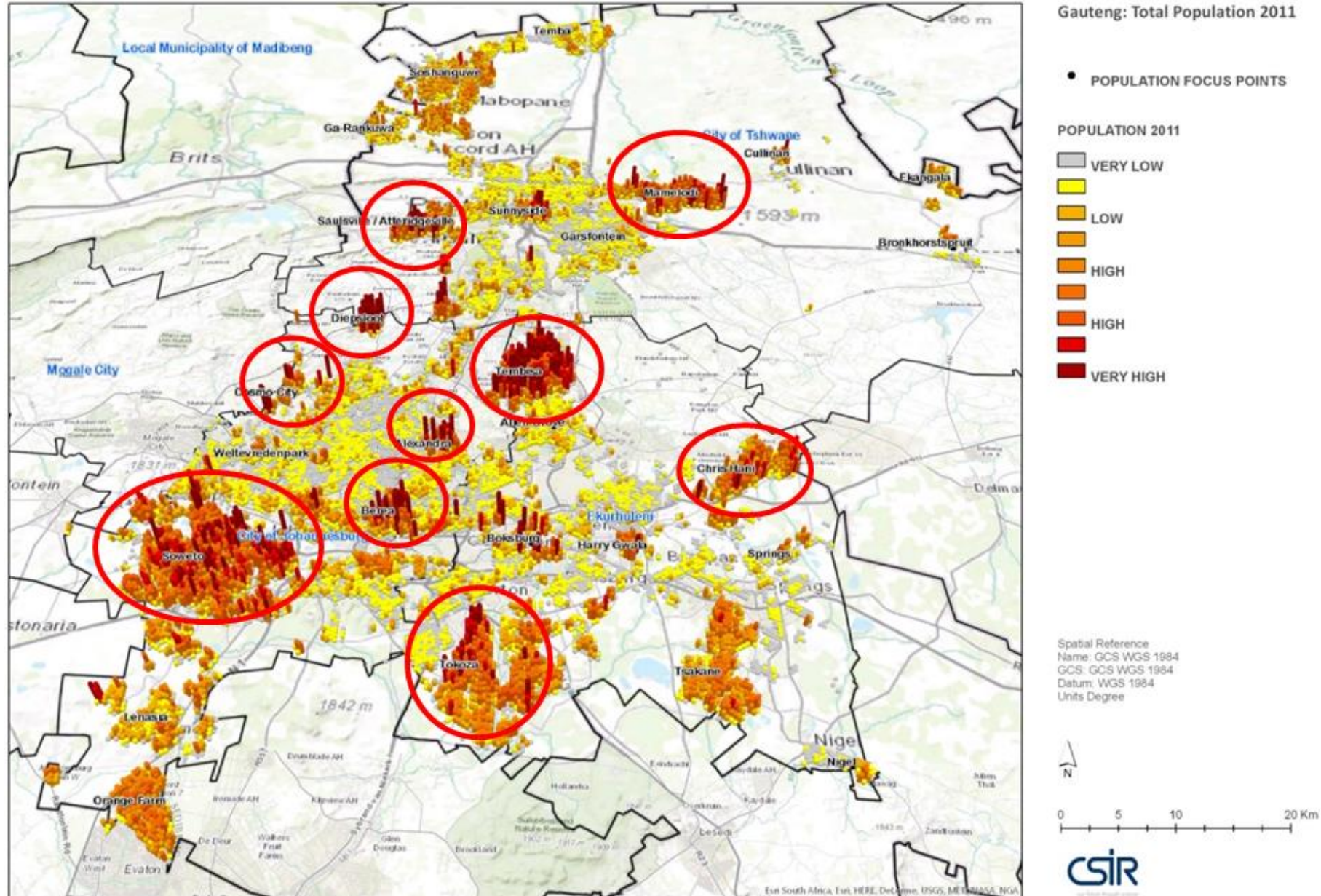
Social vulnerability is defined as the inability of people, settlements and societies to cope with, withstand or adapt to the impact of multiple stressors such as disruptive natural or manmade events. The social vulnerability index is based on 14 indicators highlighting South Africa's most vulnerable communities.

Citation: le Roux, A., Naude, A. 2014. CSIR Regional Dynamics and Interactions Analyses  
 Note: Social Vulnerability – Locating South Africa's vulnerable people.

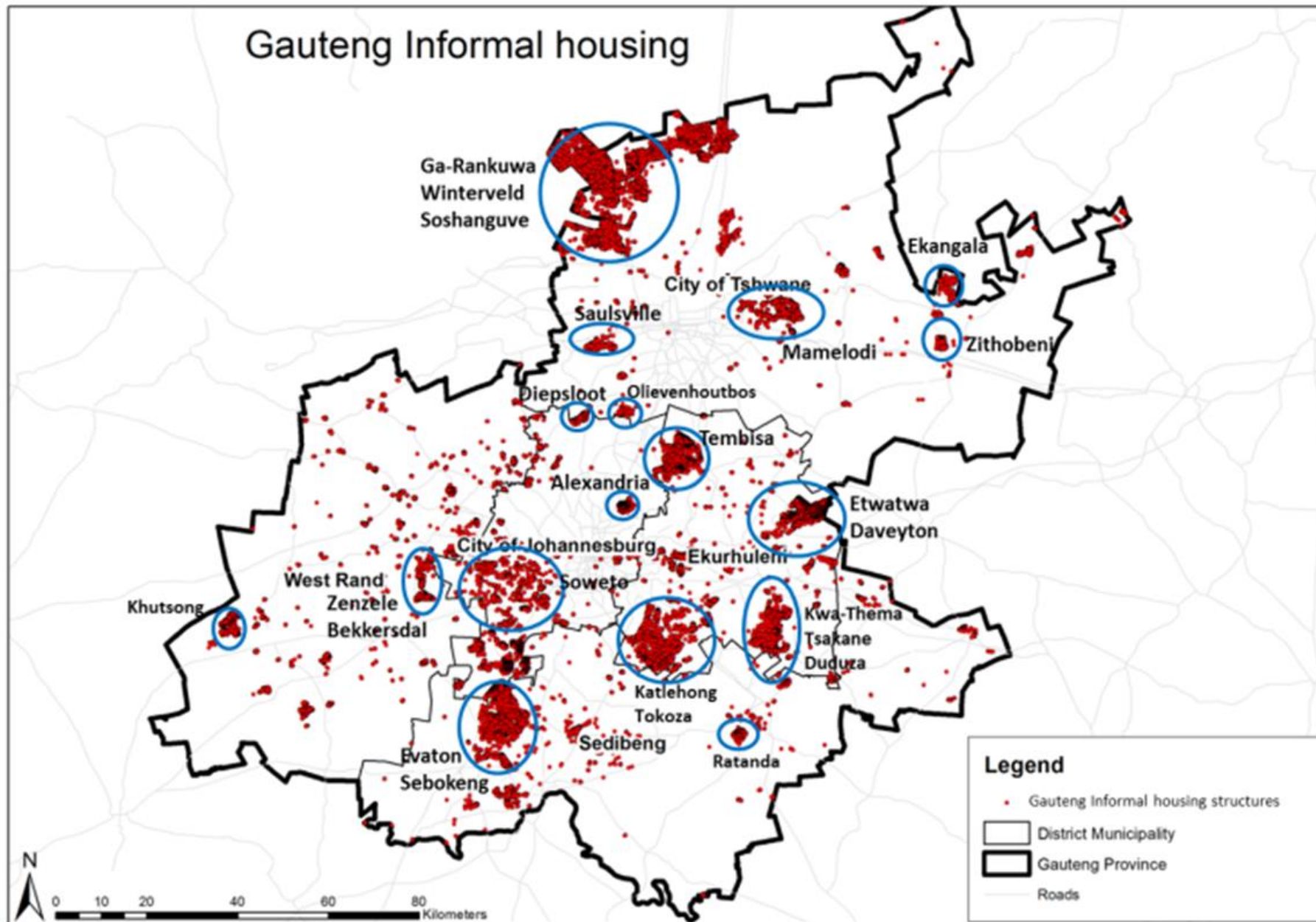
# Expansion on affordable & peripheral land



# Embedded concentration as expected

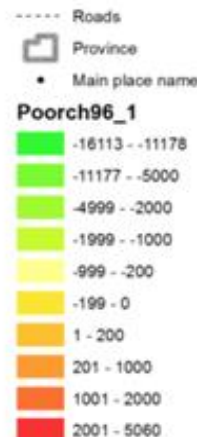
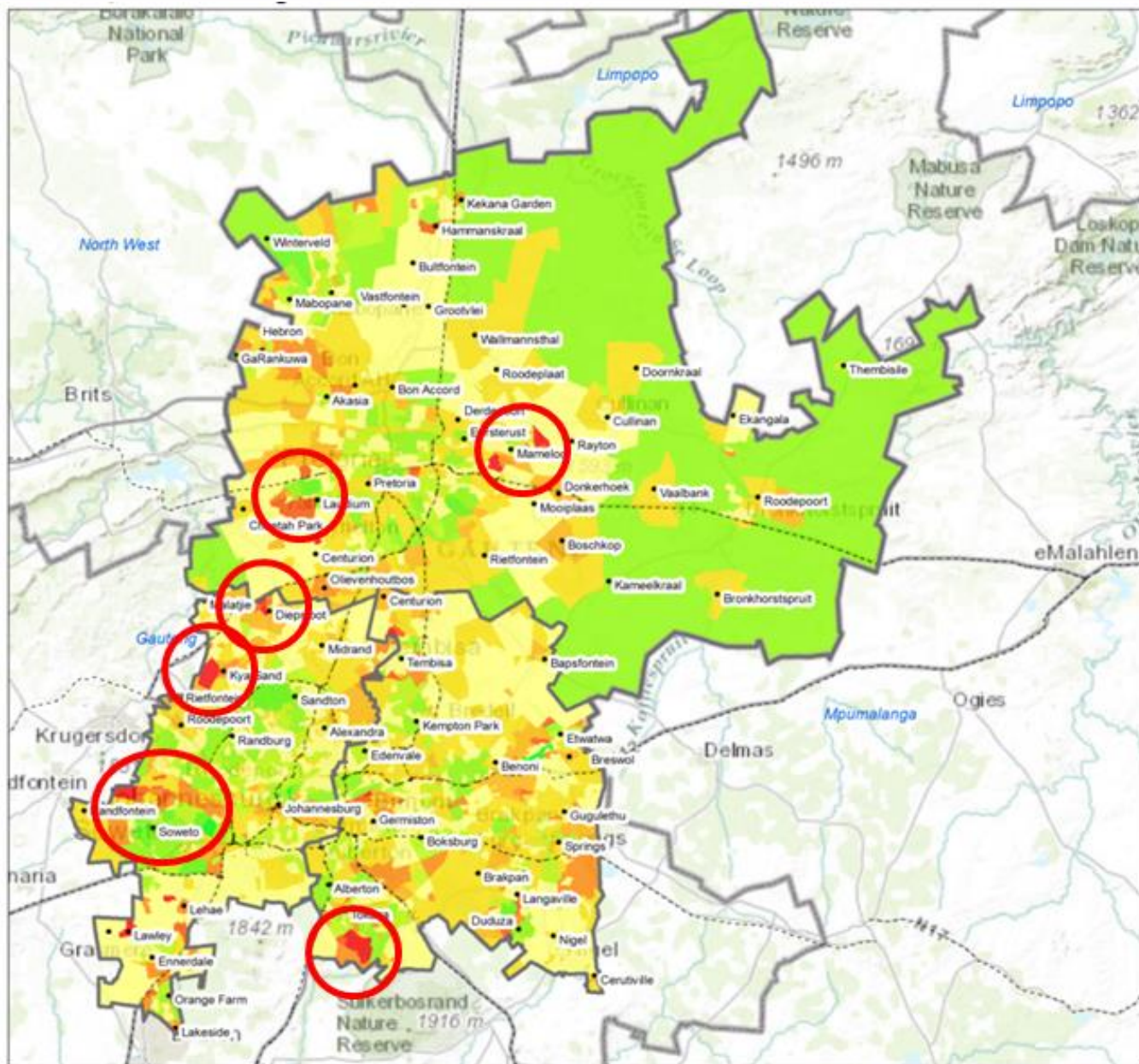


# Informal housing addressing growing need





# Locational choice or only option for the poor?

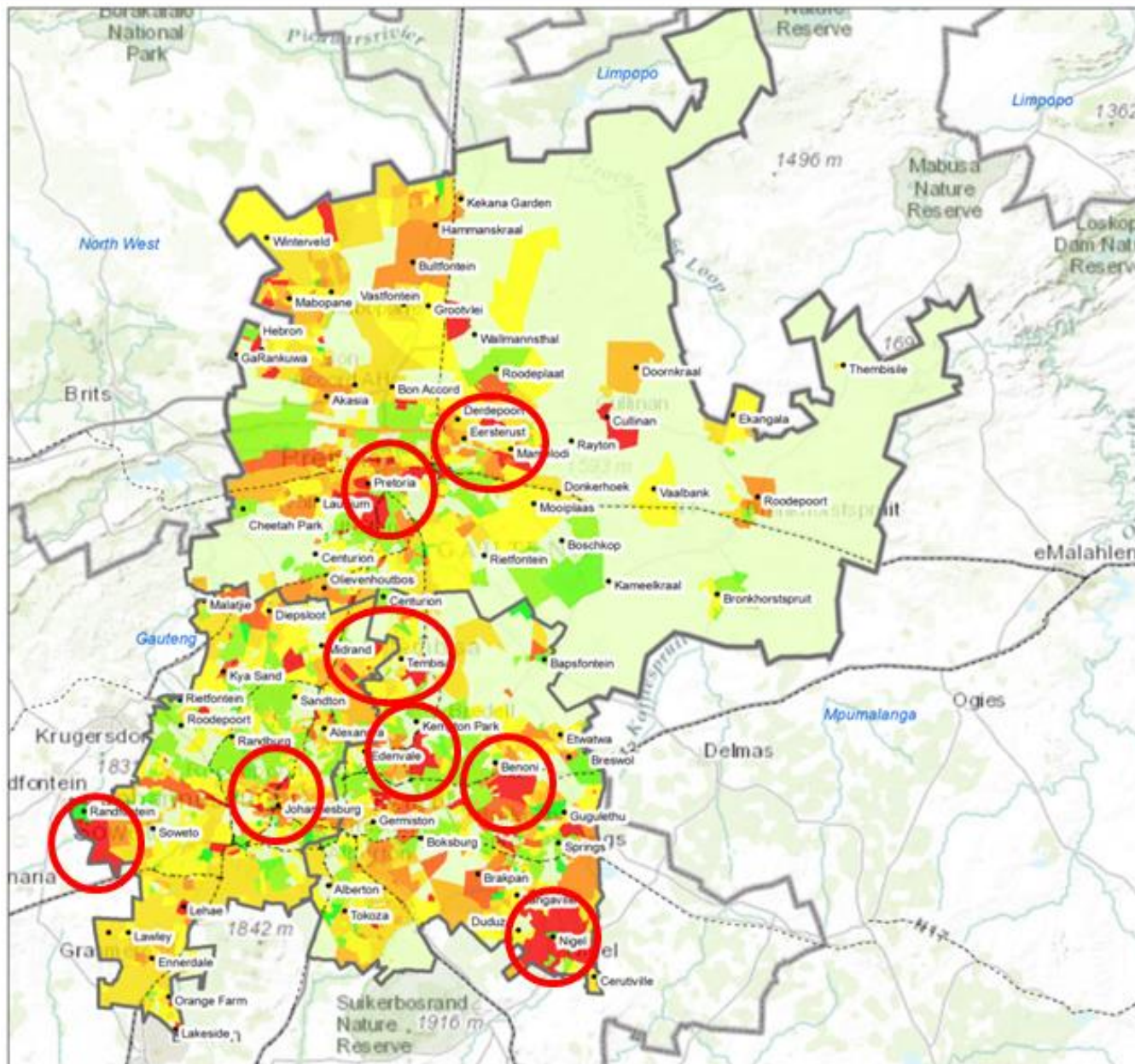


Note:

Using census information to reflect change in lowest income between 1996 and 2011. (SP for Gauteng only)

Service Layer Credits: Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

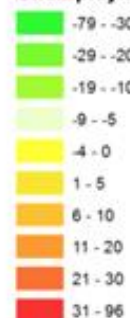
# Unemployment doesn't discriminate



## Legend

- Roads
- Province
- Main place name

## Employment/ Unemployment Unemployment perc change 96-2011

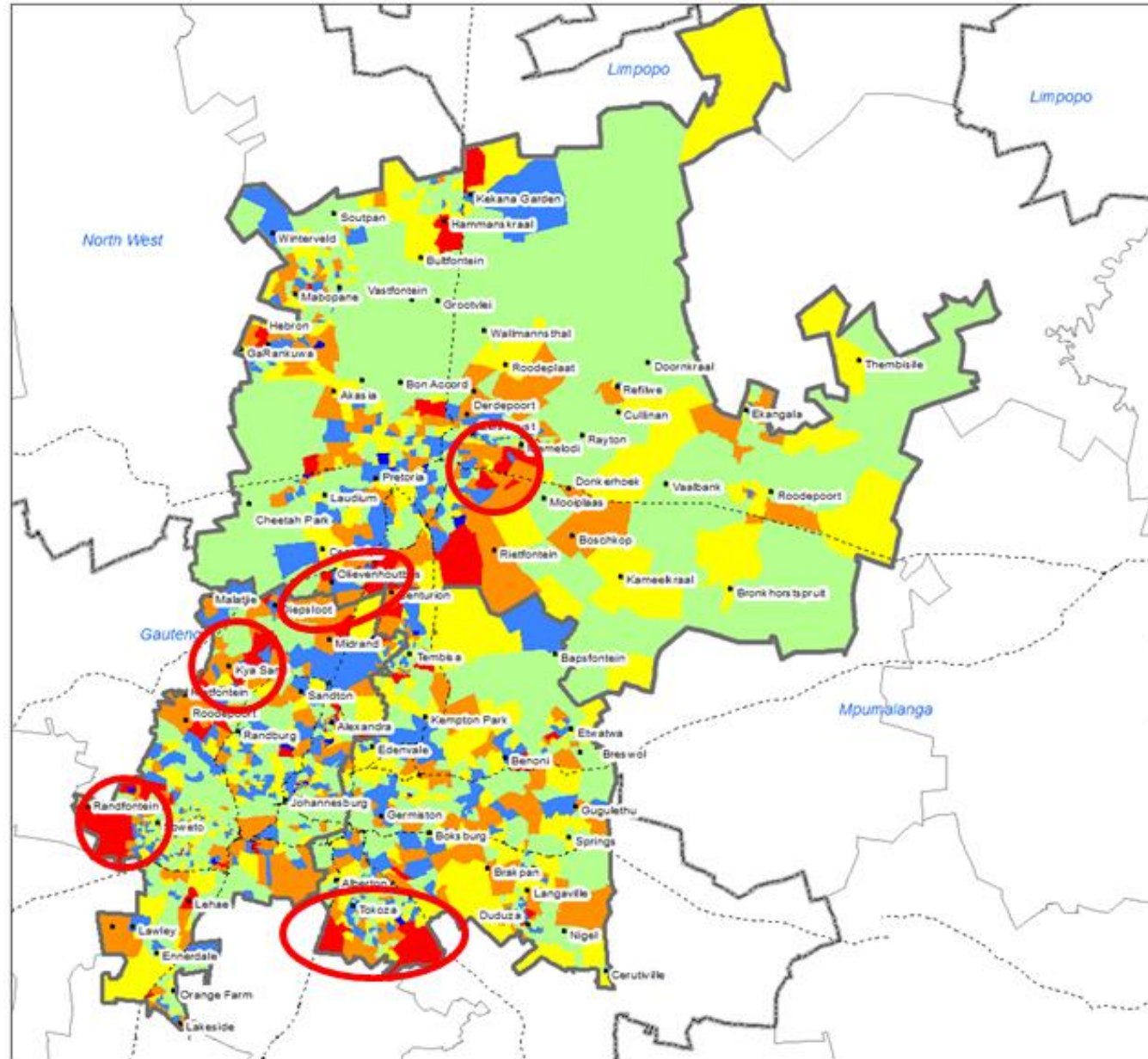


## Note:

Using census information on employment and unemployment. Unemployment consists of three items namely: recorded unemployment, not economically active and discouraged employment seekers.

Service Layer Credits: Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

# A highly mobile urban population



## Legend

----- Roads

□ Province

• Main place name

SA\_VD\_mig2006\_11

Net movement trends 2006-11

■ -1719 --500

■ -499 --100

■ -99 --100

■ -99 - 0

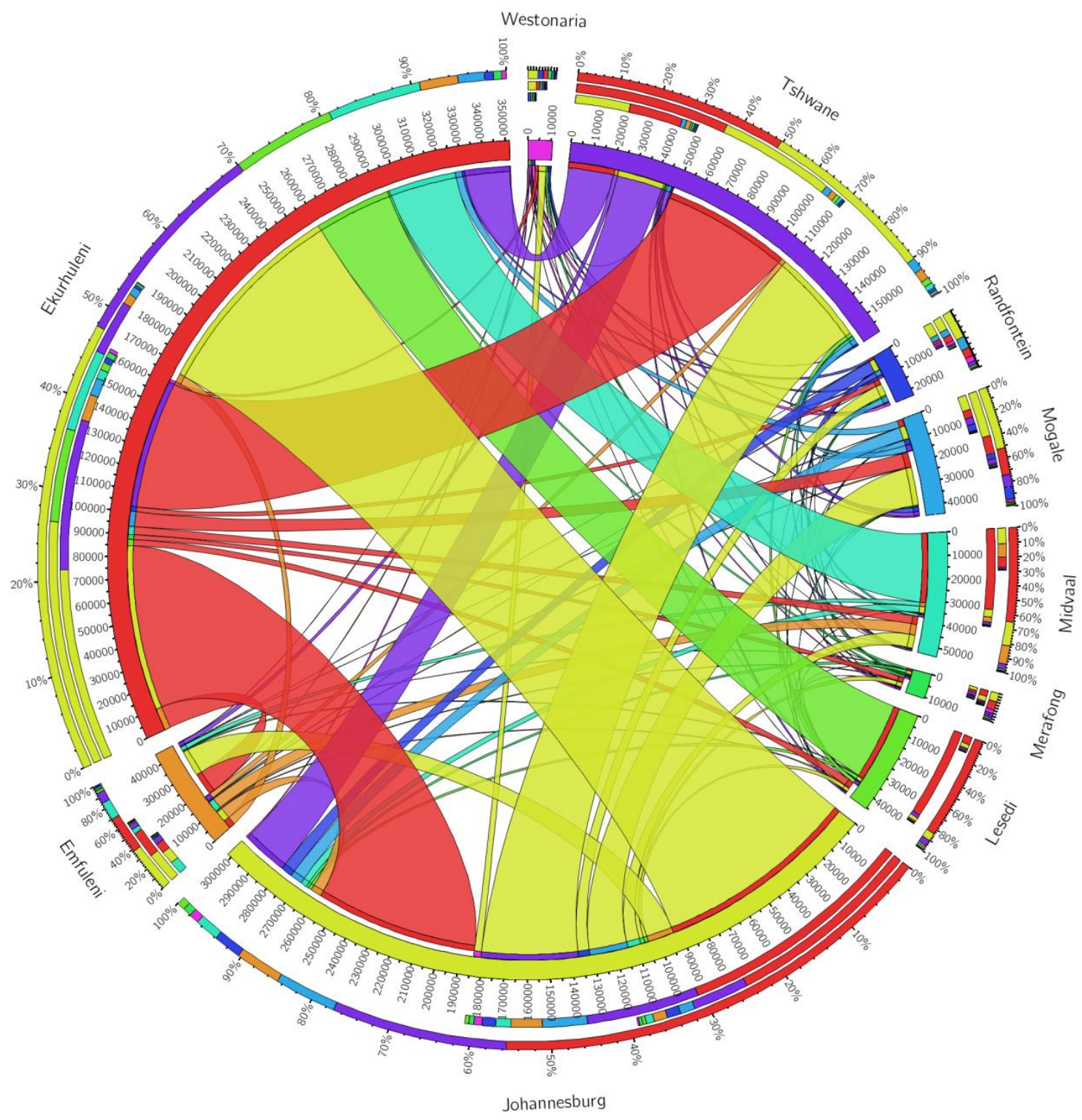
■ 1 - 100

■ 101 - 500

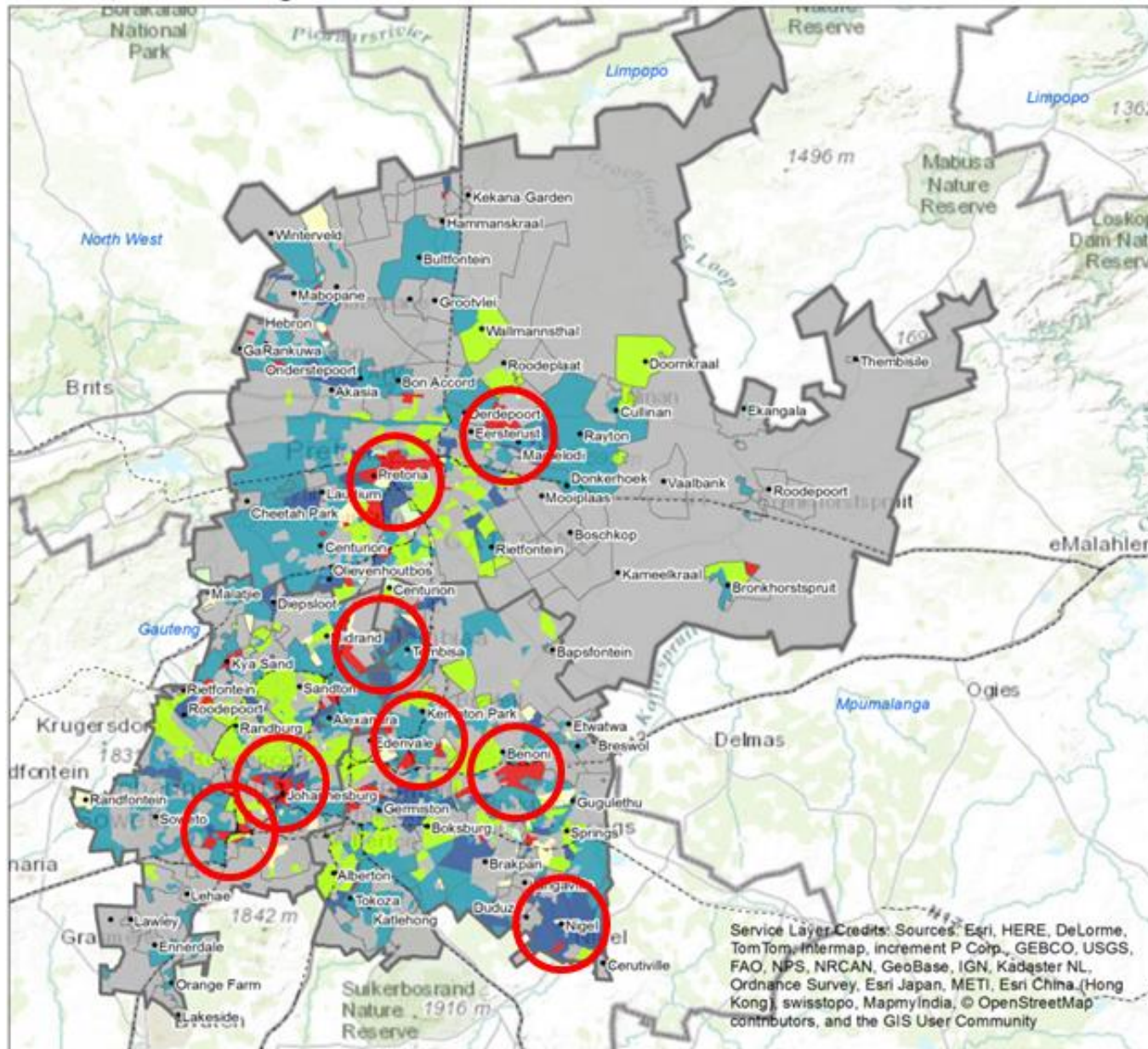
■ 501 - 2000

Note:

Using IEC information to illustrate net changes per voting district of people moving to another voting district in the period 2006-2011.



# The young and the vulnerable at the centre



## Legend

- Roads
- Province
- Main place name
- Main places

## Youth 2011

### Percentage of Youth/Pop 2011

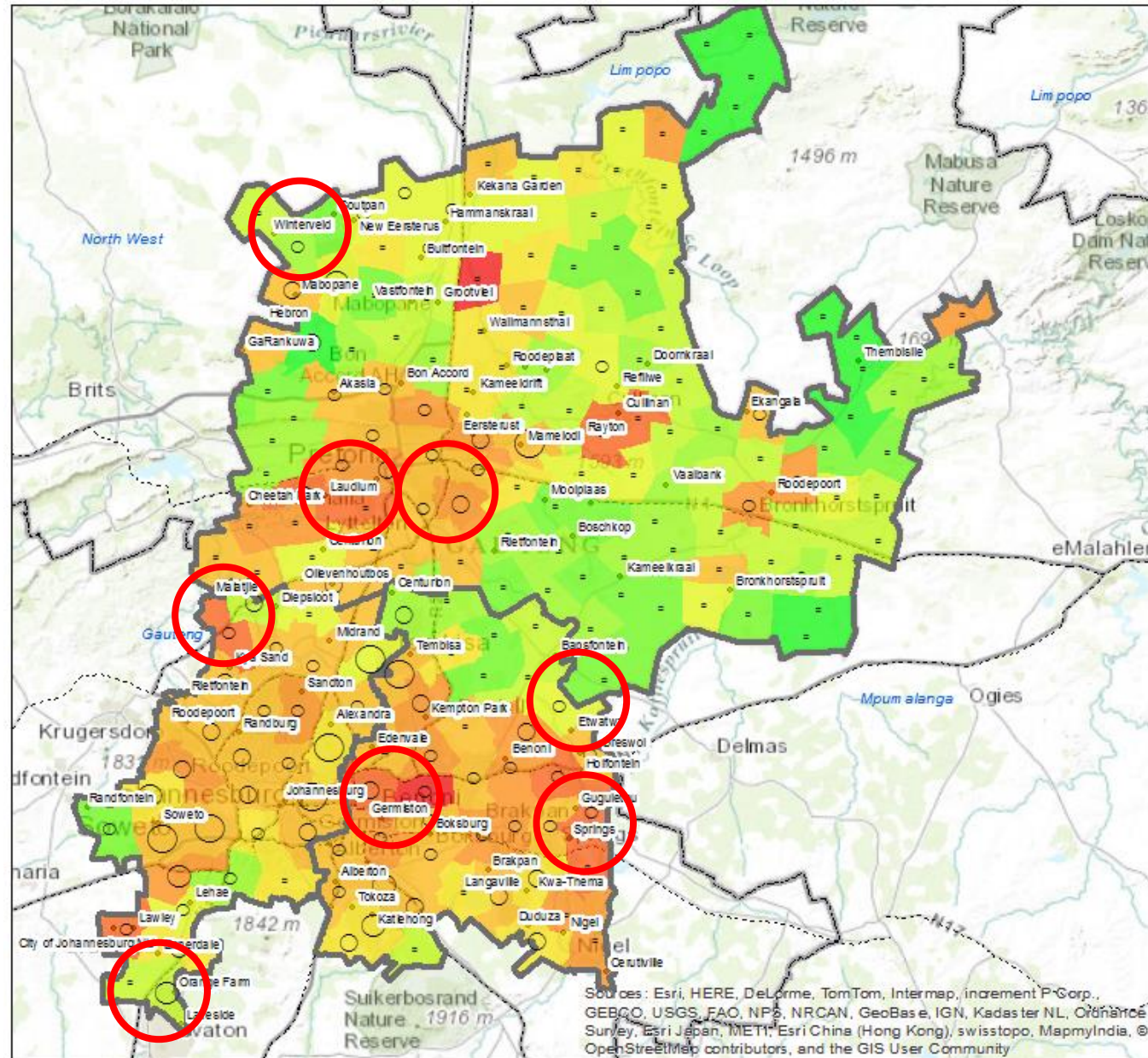
- 0.00 - 10.00
- 10.01 - 20.00
- 20.01 - 30.00
- 30.01 - 40.00
- 40.01 - 50.00
- 50.01 - 60.00
- 60.01 - 100.00

## Note:

Reflects the youth as a percentage of the total population per sub-place for 2011. Indicates areas where high proportions of the youthful population is found.

Service Layer Credits: Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

# Are services keeping up with population growth?



## Legend

### Access to good services

#### Population 2011 (meso)

- 0 - 25000
- 25001 - 100000
- 100001 - 200000
- 200001 - 300000
- 300001 - 569839

#### P\_Change

- -35 -- -25
  - -25 -- -10
  - -10 - 0
  - 0 - 10
  - 10 - 20
  - 20 - 30
  - 30 - 40
  - 40 - 50
  - 50 - 60
  - > 60
- Roads  
 □ Province  
 • Main place name

## Note:

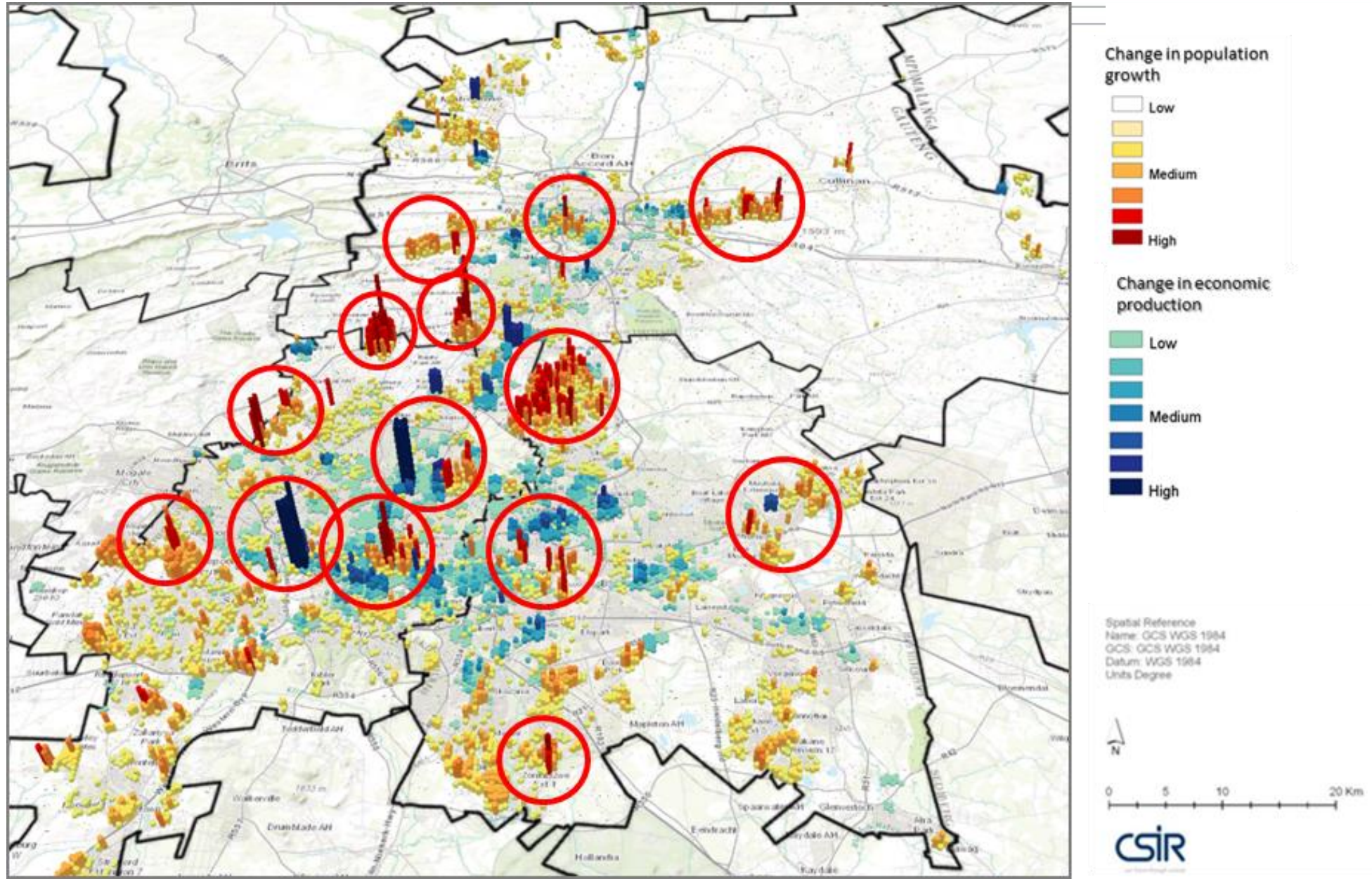
Indicates the percentage change in access to good services.

A composite value for access to services was determined by calculating the average number of households who received either good or not-so-good service based on the level of access to:

- (1) energy source for lighting;
- (2) refuse removal;
- (3) toilet facilities; and
- (4) water source.

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P-Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBas e, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

# The relationship between population growth and economic opportunity



# Summary

- Population growth is occurring in places where housing is more affordable and close to opportunity
- Traditionally marginalised areas have generally experienced improved access, services and increased income levels
- Urban centres are seeing an influx of young adults, increasing unemployment and a decline in access to services
- Cities are experiencing high levels of mobility and in-migration as well as a decline in average household size



# In conclusion: Some questions

- Are new large-scale housing investment (public and private) embedding existing as well as creating more unsustainable patterns of concentration and isolation?
- Does the growth and densification we are seeing translate into increase in revenue and income, or is it just increasing pressure on cities?
- When there are complex issues such as informality in our cities, should informality be accepted as a response to the housing backlog and as a human response to minimise risk and vulnerability?
- How can policy makers prioritise and manage urbanisation challenges to address urban risk and vulnerability?



Thank you



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