

# ***“Achieving the Vision”***

**Geo-statistical integration addressing South Africa’s  
Developmental Agenda**

## **‘Geo-statistical analysis’**

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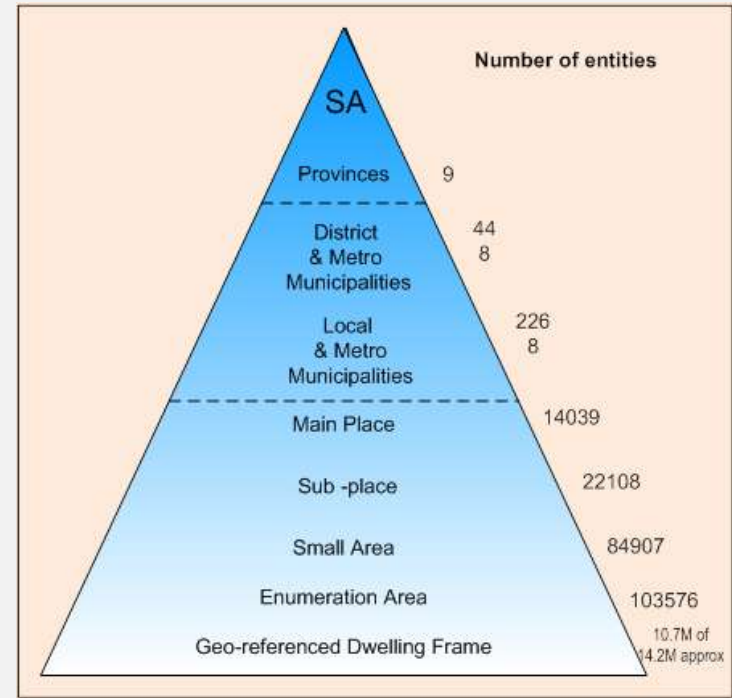
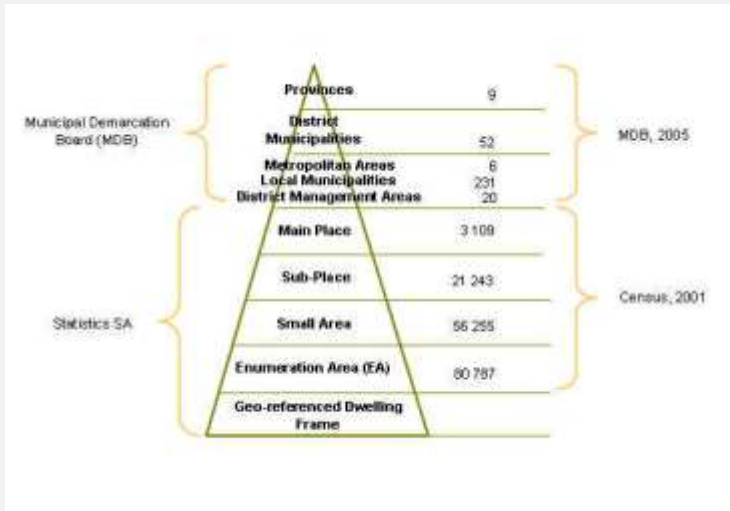
**Inspire - Geo-spatial World Form (Session: Geo-Statistics)  
27 May 2015, Lisbon, Portugal**

# Contents . . .

- **Statistics South Africa – relevance of geography – *institutionalizing geography* through legislative change**
- **SA Developmental Agenda – impetus for tight integration**
- **Focus on **USABILITY** through geo-statistical analysis:**
  - **Indicators of growth & development of local municipalities;**
  - **Municipal capital spending patterns & the reshaping of urban structure in South Africa;**
  - **Estimating population;**
  - **Predicting and classifying urban & rural areas in South Africa.**
- **Concluding remarks**



# Statistical geography a key strategic direction for Stats SA ...



**Standard Geographic Frame  
(consistent & stable over time)**

**Geo-statistical Building Block against which information can be collected & rolled up for dissemination**

**Updated & reliable fundamental sampling frames: Dwelling/ Address Frames; the Business Frame**

**Built a dependency on other data suppliers/ producers. We want quality data from them. Dependency on a functioning SASDI. Therefore statistics supports the SASDI development.**

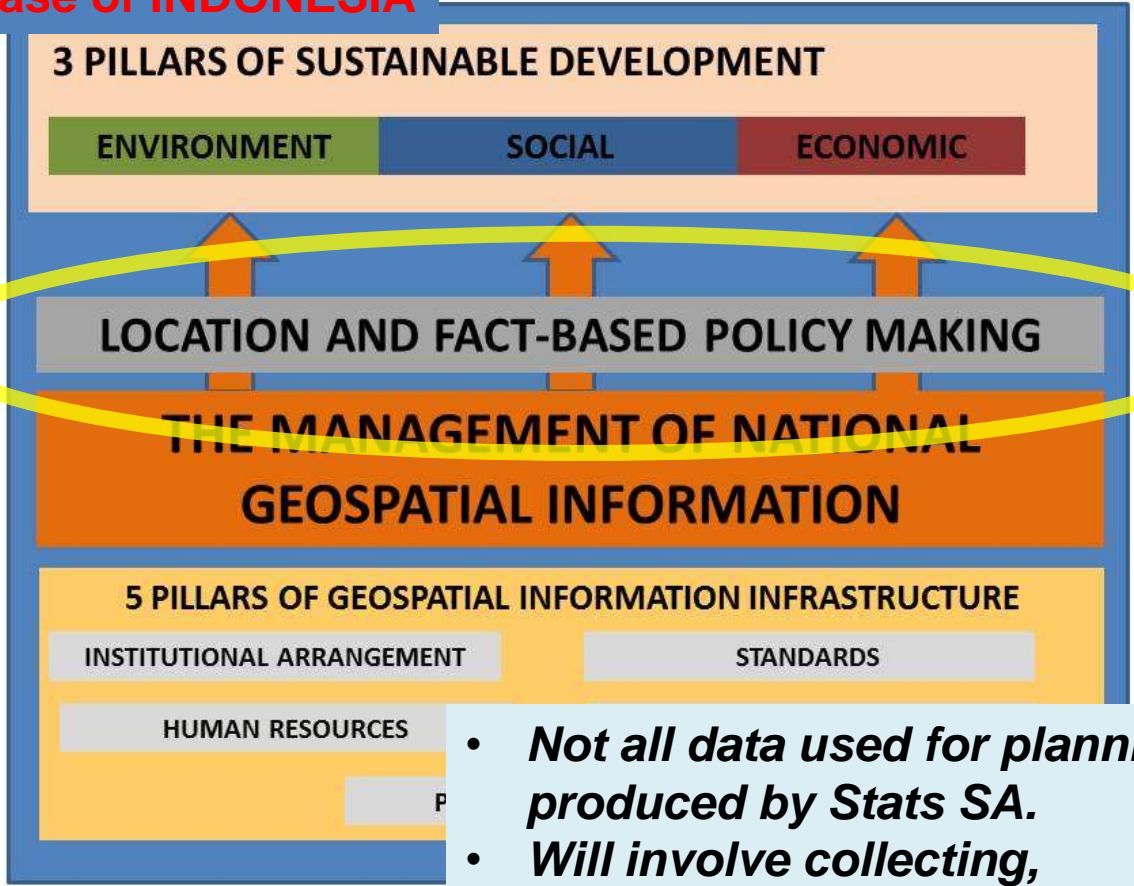
**Geo-statistical analysis**

# South Africa's National Development Plan (NDP) - Vision 2030

## THE DIAGNOSTIC

- Evidence-based. Spatial & Statistical information basis for planning, monitoring and evaluation – South Africa's Developmental Agenda

### Case of INDONESIA



Use resources properly

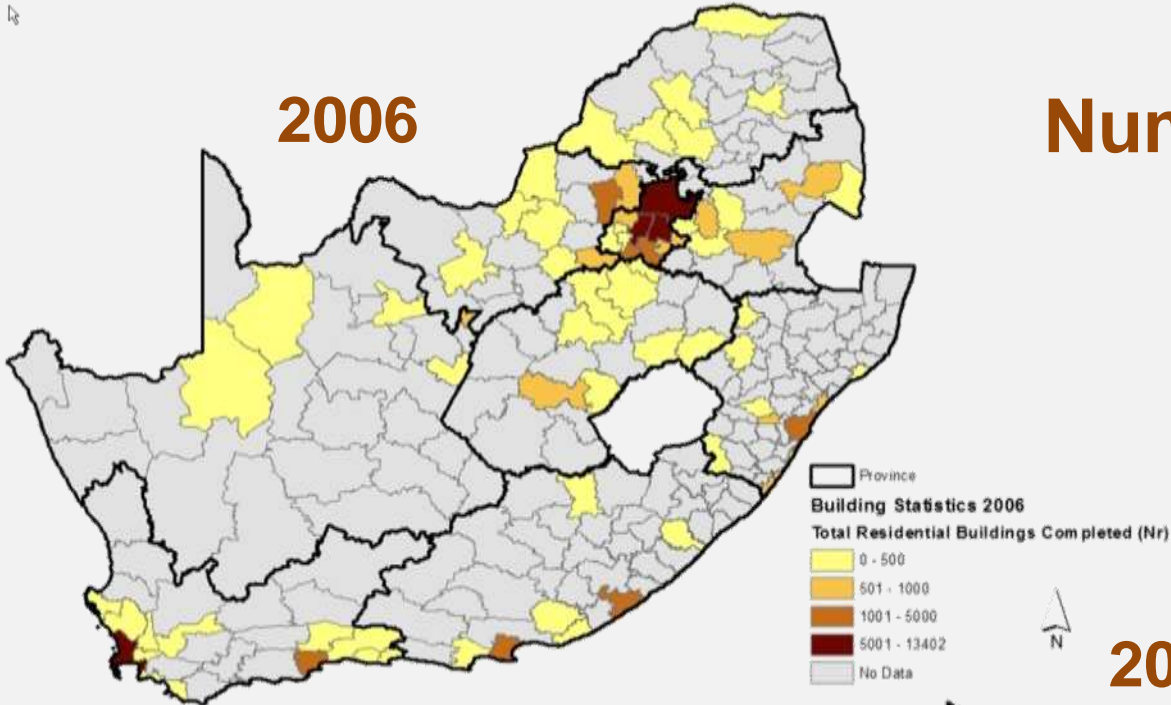
- Clear statement of priorities.
- Adopted by Cabinet
- Alignment of short-term, medium-term & long-term planning

- Not all data used for planning is produced by Stats SA.
- Will involve collecting, standardizing, utilizing important information from other sources.
- Dependency on a functioning NSS.

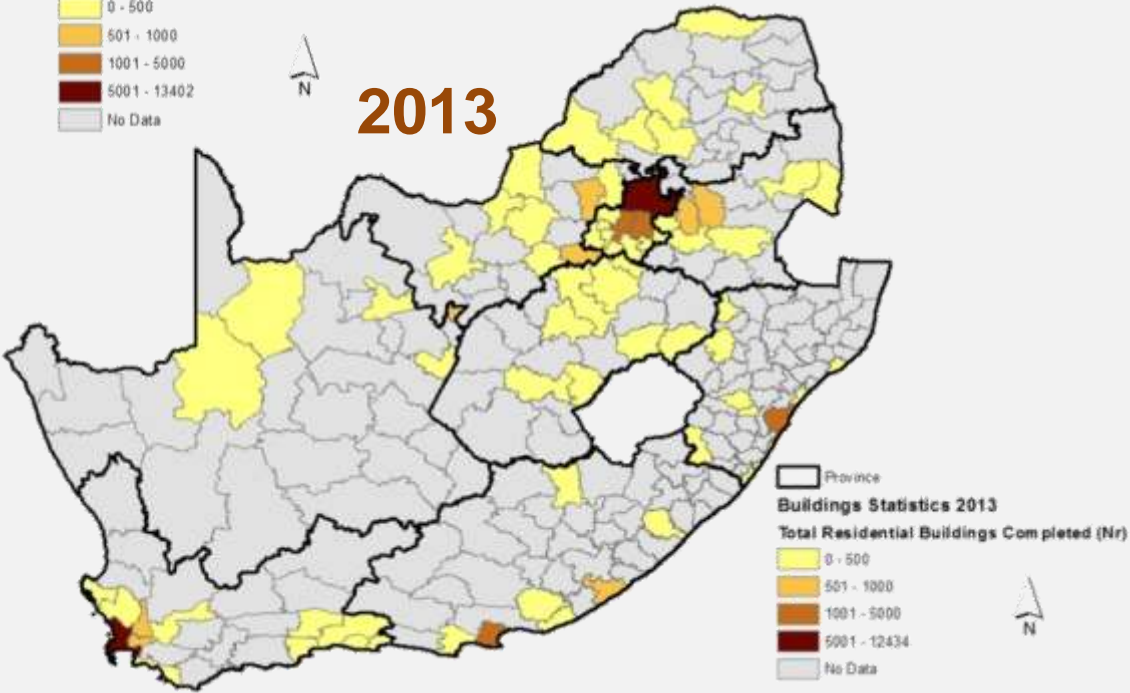
# Policy Analysis = Geo + Stats

# Number of buildings completed

2006

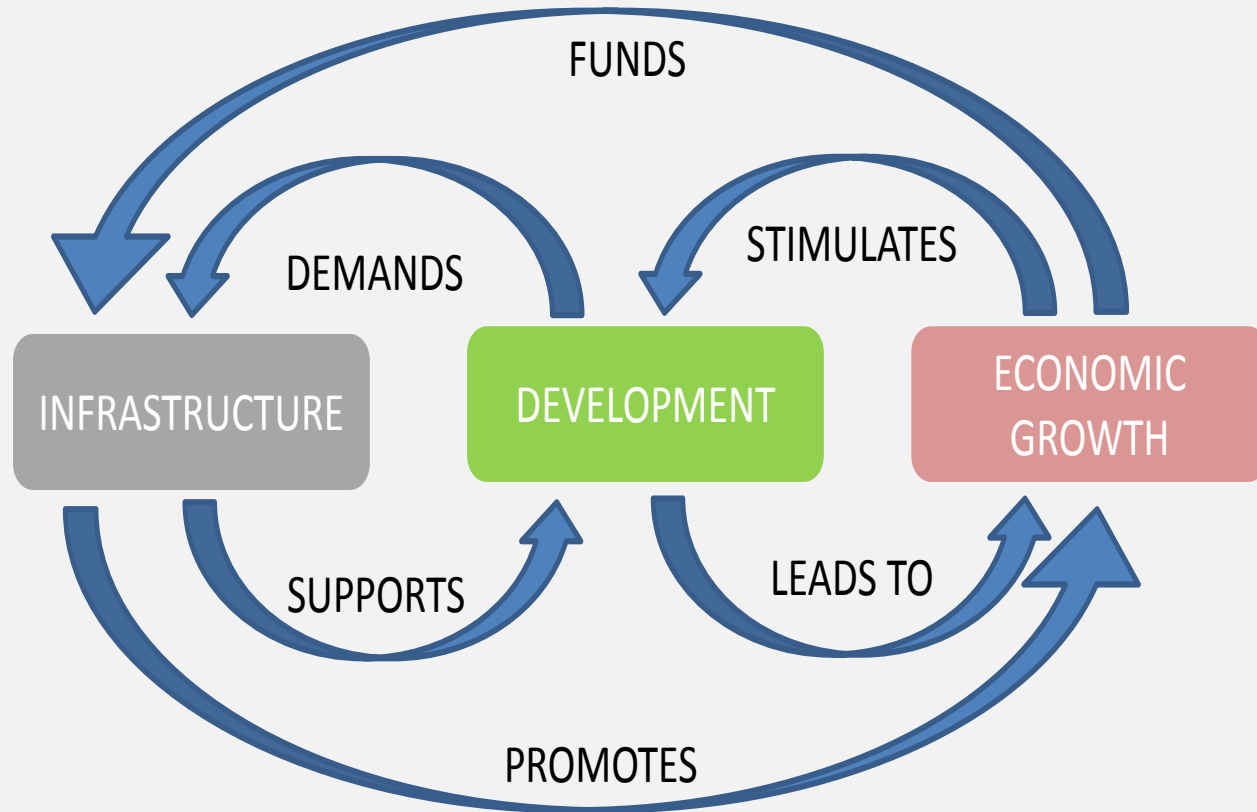


2013



*In both 2006 and 2013, Cape Town and Tswane completed the most number of buildings*

# Role of infrastructure in growing the economy



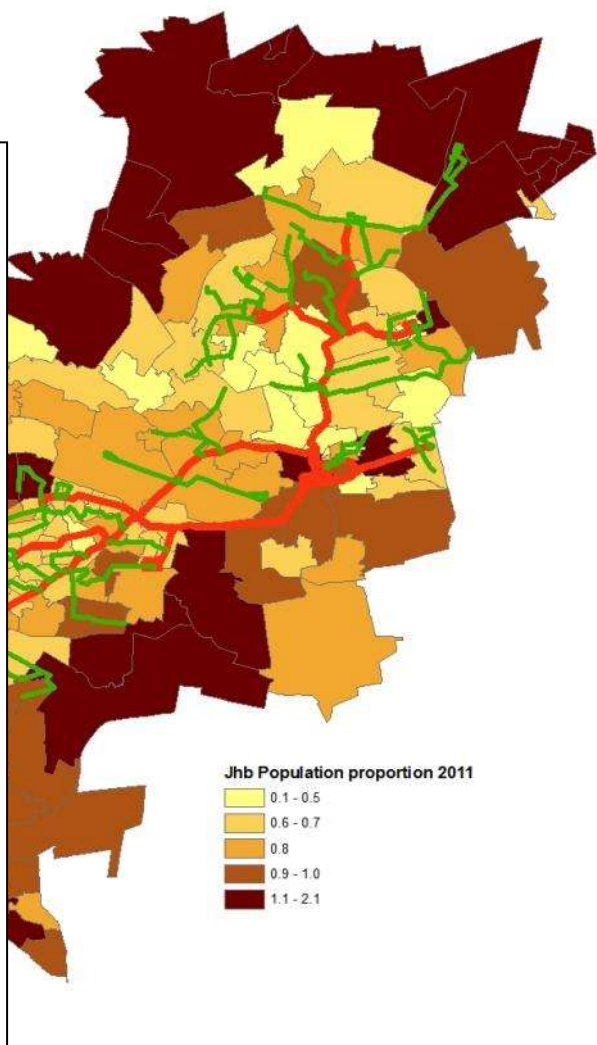
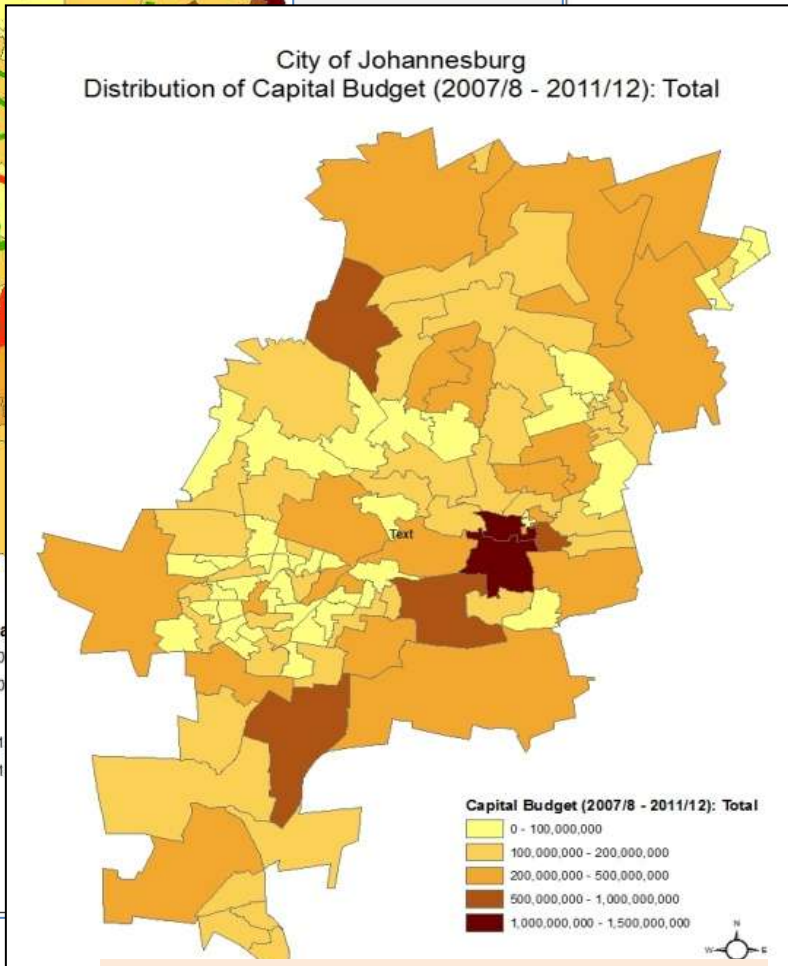
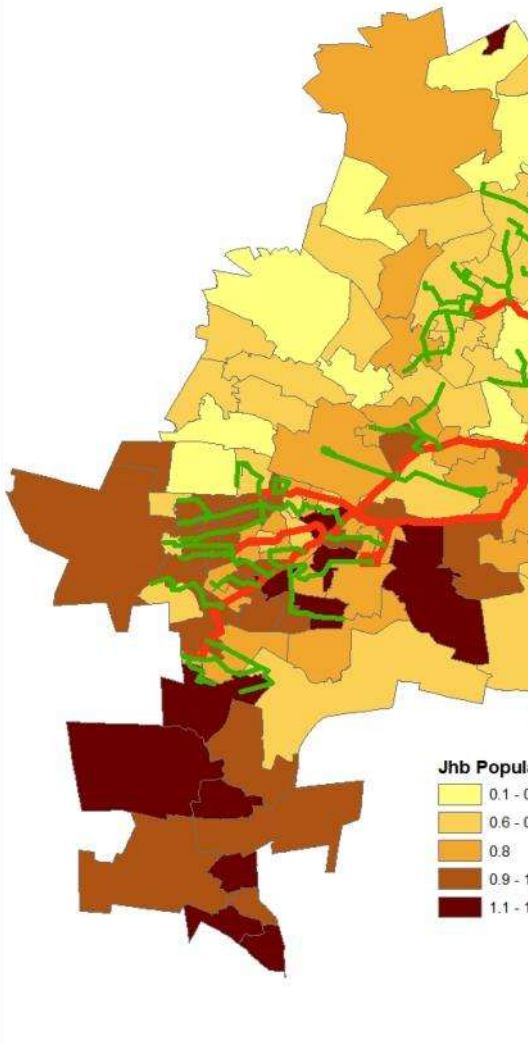
Source: GIIMP (Gauteng Integrated Infrastructure Master Plan Framework), 30 March 2015



# Municipal Capital Investment Framework & Spatial Development Frameworks

Census 2001 Population

Census 2011 Population

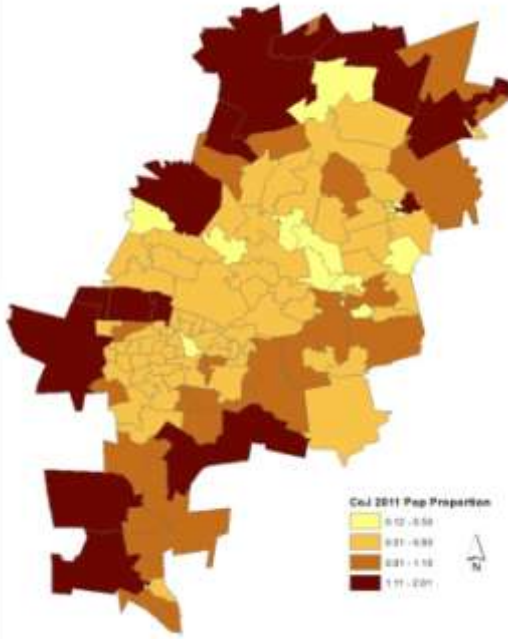


Public Capital Spending

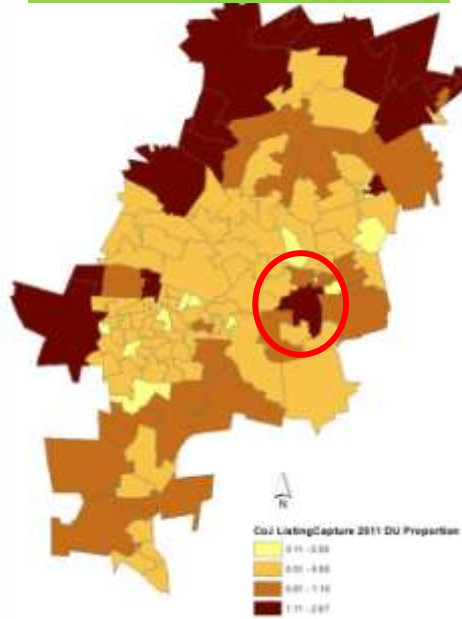
# Estimating

# Vision – “ taking infrastructure to the people “

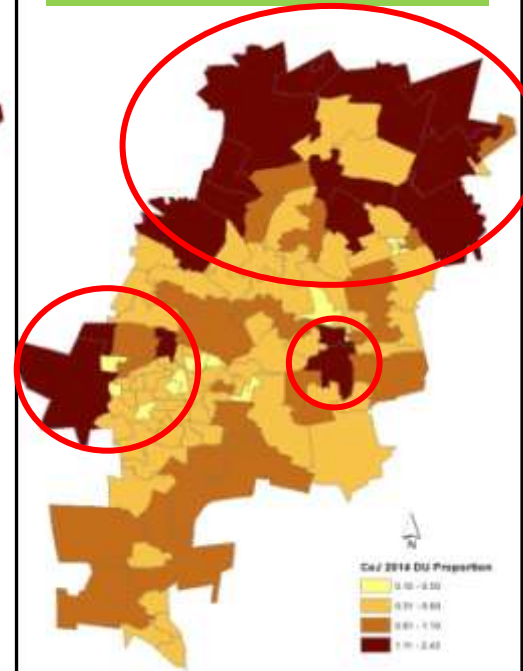
Census 2011: Population



DU Count Listing Capture 2011



DU Count 2014

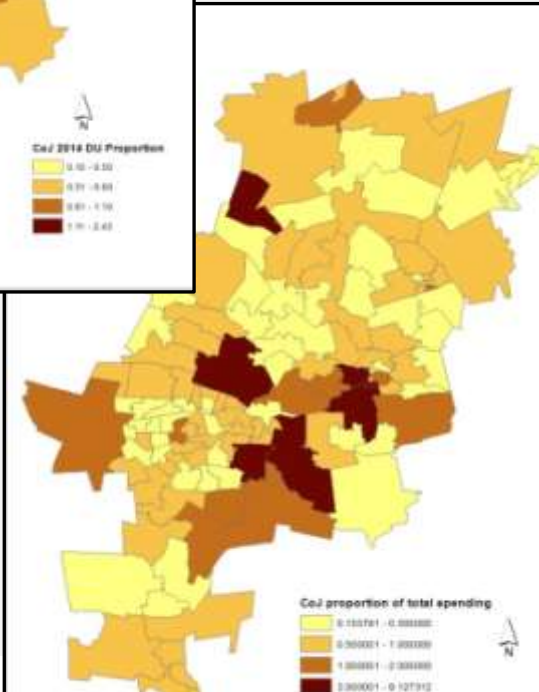


Trends in population distribution over space & time

City of Jo'Burg

Next steps ...  $P_t = (H_t * PPH_t) + GQ_t$

Source: Public Capital Spending Data supplied by City of Jo'Burg, Census & Dwelling Unit Count supplied by Stats SA, Maps created by Stats SA



Public Capital Spending 2009 to 2014

# Predicting & Classifying

# NDP key priority areas

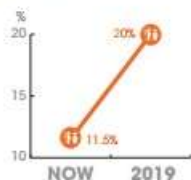
## RURAL ECONOMY

Our rural areas are an important part of the fight against poverty and important as sources of goods for the whole economy. Here are some of the goals and intermediate steps focused specifically on building the rural economy.



By 2019 create 1 000 000 jobs in the agricultural sector

OWNERSHIP OF PRODUCTIVE RURAL LAND BY PREVIOUSLY DISADVANTAGED PEOPLE



POPULATION LIVING BELOW THE POVERTY LINE



HOUSEHOLDS LINKED TO THE ELECTRICITY GRID



(75% of those not connected should have access to off-grid technology)



By 2019 another 1 250 hectares used by smallholders should be under irrigation and another 80 000 additional smallholders should receive farming support



By 2019 300 rural communities and 200 rural schools will have functional ICT infrastructure



Numerous formal and informal enterprises will be established in rural communities with people given skills and employed by them

## NDP Chapter 6: Inclusive Rural Economy

## HUMAN SETTLEMENTS

Our towns and cities often have many homes of inadequate standards with a lack of supporting infrastructure. People also often don't have the legal rights to their own homes or access to ones they can afford. Here are some of the goals and intermediate steps to improve human settlements.

HOUSEHOLDS LIVING IN ADEQUATE HOUSING



NOW

11 200 000



BY 2019

extra 745 000/year

HOUSEHOLDS THAT BENEFIT FROM UPGRADED INFORMAL SETTLEMENTS (SINCE 2010)



NOW 447 780



2019 750 000

HOUSING UNITS PROVIDED FOR SUBSIDISED HOUSING MARKET (CUMULATIVELY OVER FOUR YEARS)



NOW 463 504



2019 563 000

HOMELOANS GRANTED IN THE AFFORDABLE HOUSING MARKET BY BANKS AND STATE FUNDERS



TITLE DEEDS TO BE ISSUED TO NEW HOMEOWNERS IN THE SUBSIDISED HOUSING MARKET



TITLE DEEDS TO BE ISSUED TO EXISTING HOMEOWNERS

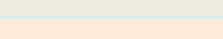


CONSUMERS TO BE EDUCATED IN THE AFFORDABLE HOUSING MARKET REGARDING THE USE OF TITLE, HOME LOANS AND SELLING PROPERTY



BY 2015

400 000



## NDP Chapter 8: Human Settlements

# Classifying areas into urban & rural using spatial statistics

This paper is co-authored with Mr. Sulaiman Salau, University of Witwatersrand, Johannesburg, RSA

# Data sources: Socio-demographic (Census 2011); Environmental (Dwelling Frame & satellite imagery)

## Census 2011

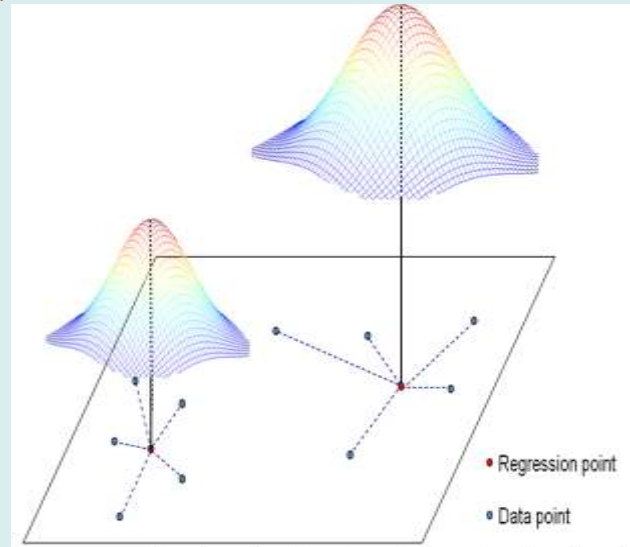
Population density  
 %Females  
 %0 to 6 year old  
 %7 to 18 year old  
 %19 to 34 year old  
 %35 to 64 year old  
 %65 plus  
 %No or some schooling  
 %Unemployed  
 %No income  
 %Working in the formal sector  
 %In-migration  
 %Basic services (water, electricity, sanitation, refuse)  
 %Traditional dwellings  
 %Dwelling owned, not paid up  
 %Rented  
 Etc.

## Dwelling Frame

%Residential Dwelling points  
 %Commercial points

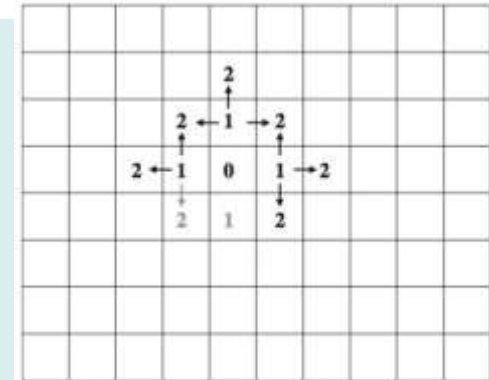
## Classified satellite imagery

%Built-up dense settlements  
 %Roads & rail  
 %Natural water & wetlands

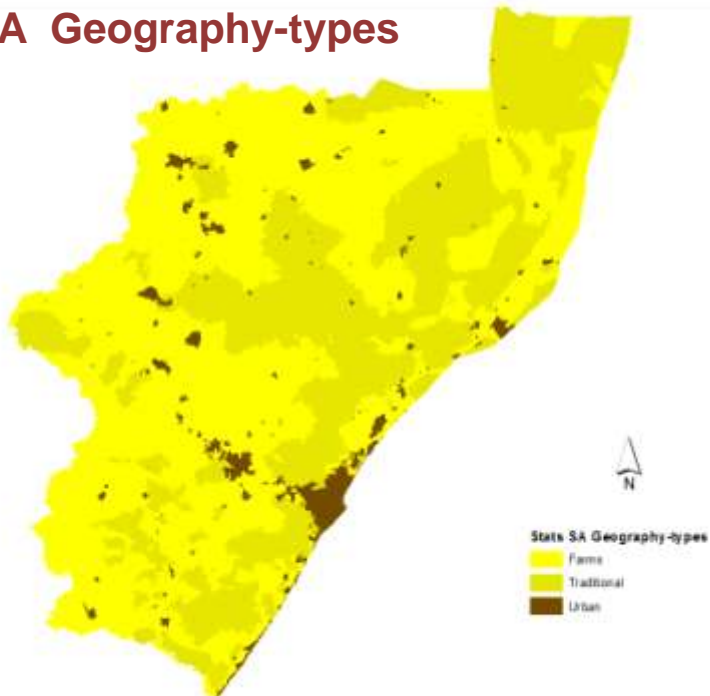


## Methodology: LLR, PCA, GWR, AMOEBA algorithm

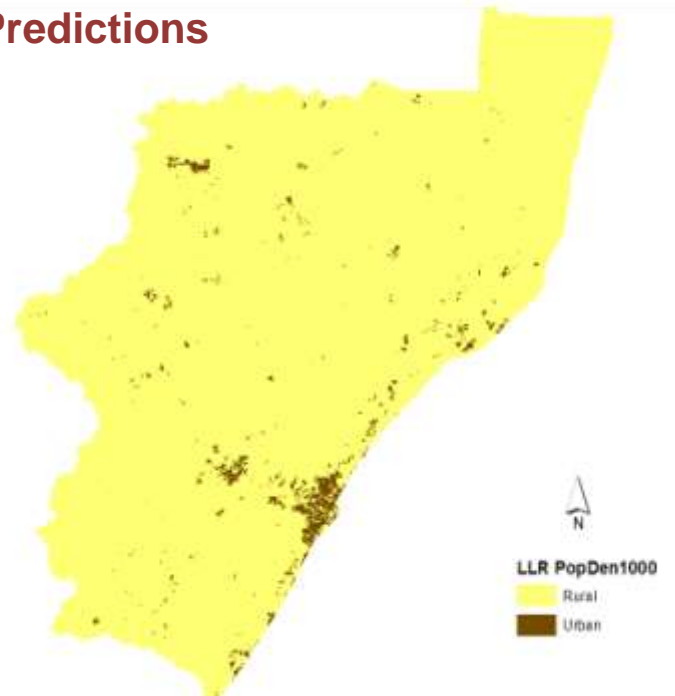
Population Density was modeled.



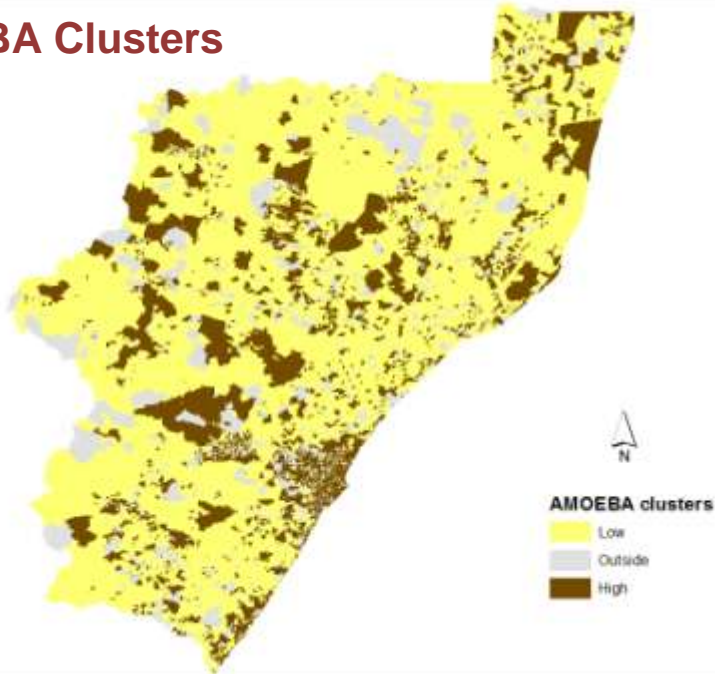
### Stats SA Geography-types



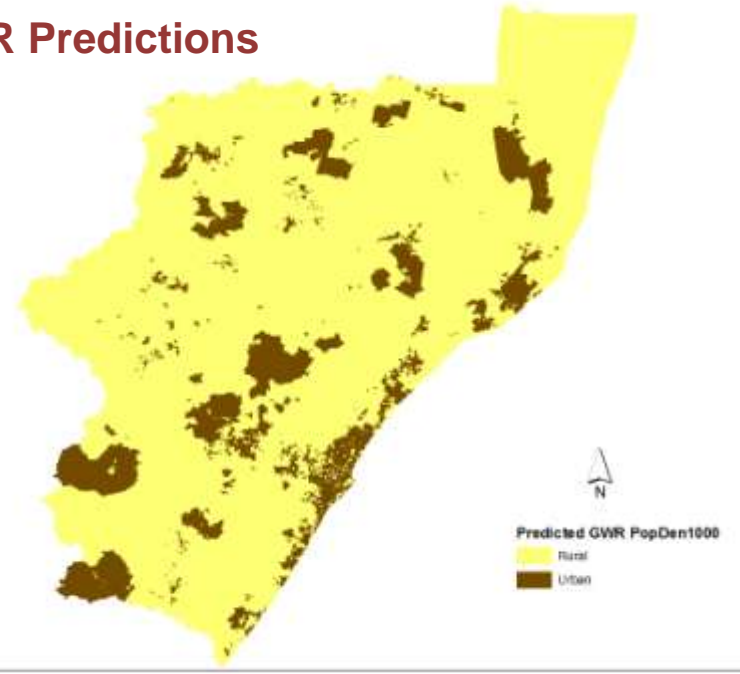
### LLR Predictions



### AMOEBAs Clusters

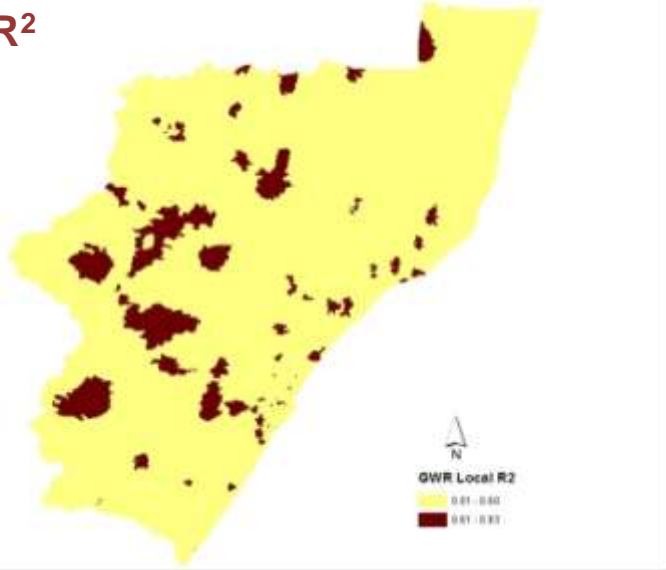


### GWR Predictions

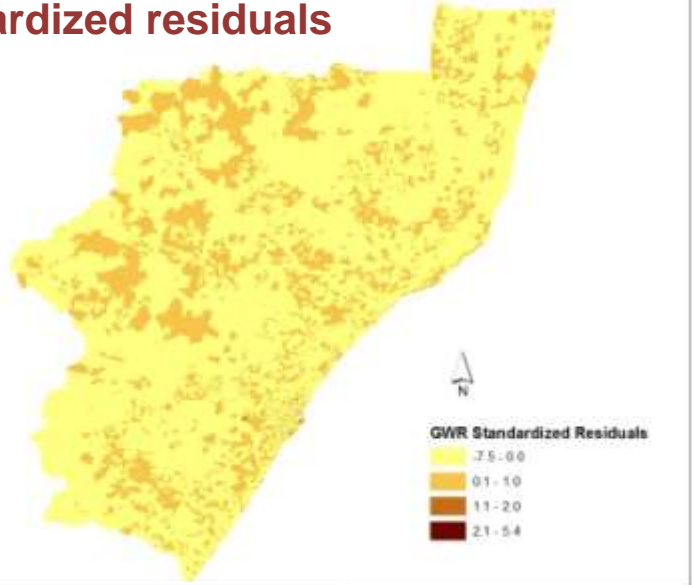


# GWR detail analysis

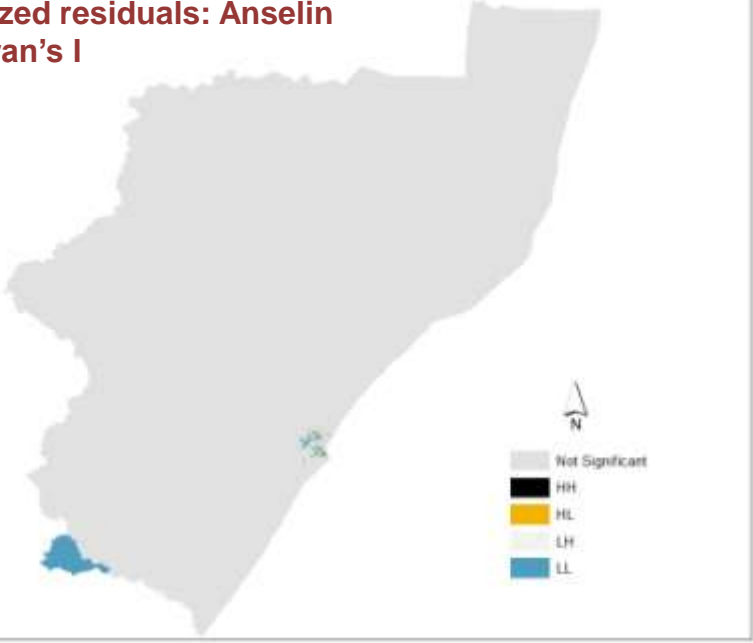
Local R<sup>2</sup>



Standardized residuals



Standardized residuals: Anselin Local Moran's I





# Concluding remarks . . .

- **We want seamless integration.**
- **Every statistic must have a geography. Never collect statistics without its geography, always carry its geography.**
- **Geography must be collected at the point where the event has occurred (unit level).**
- **Consider National Geo-statistical System, instead of National Statistical System.**
- **Focus on **USABILITY** through geo-statistical analysis for the evidence-based.**

# Thank U

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