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BETTER TOGETHER.

URBANISATION & IMPACT ON BASIC SERVICE DELIVERY

Presentation to PP&DF

4 August 2016

H Jacobs

Urbanisation & what it means for basic service delivery in the Western Cape?

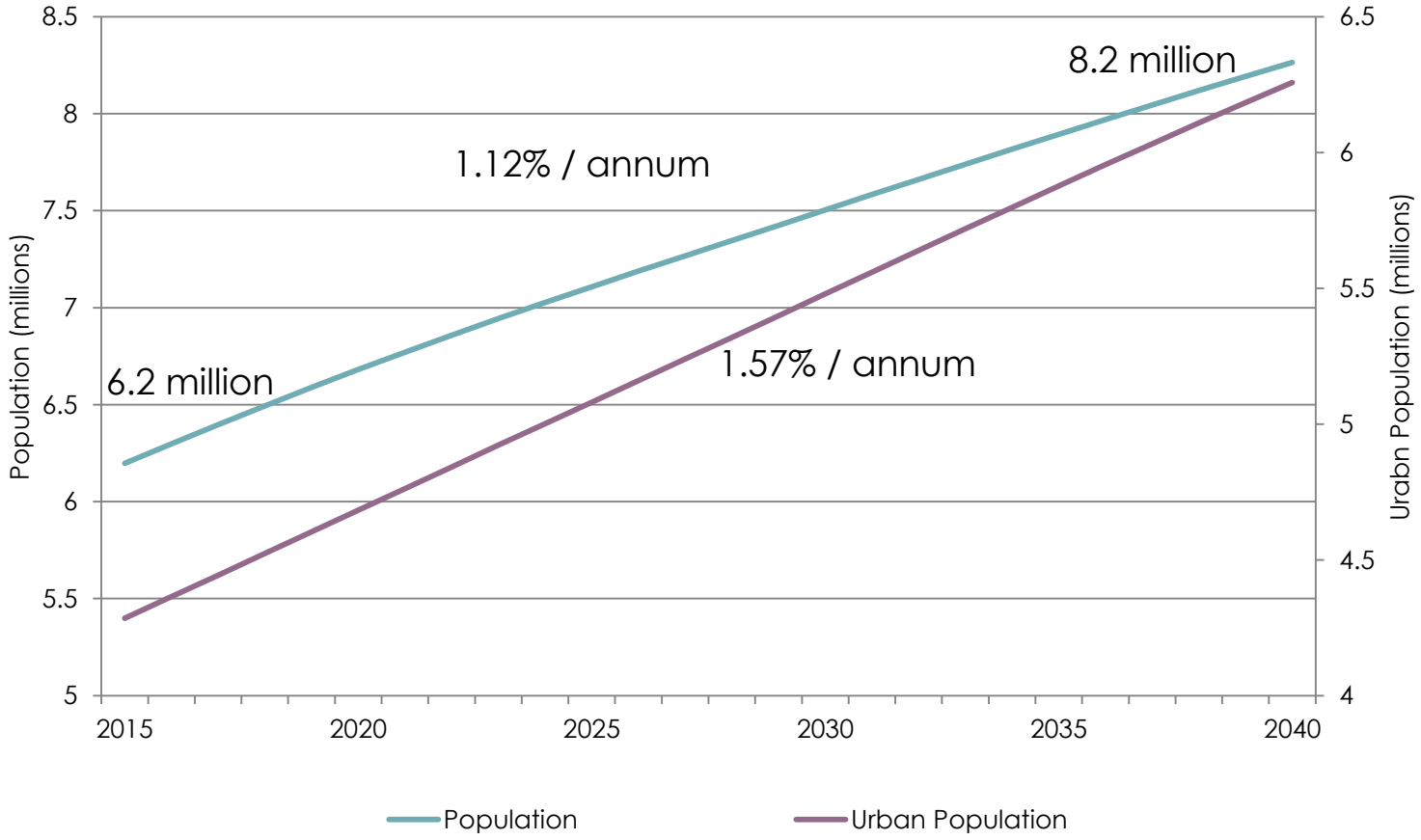
Urbanisation = increase in the urban population of a country or area due to the following components of urban population growth:

- urban natural increase,
- urban net migration, and
- the reclassification of parts of the rural population into the category 'urban' (due to the sprawl of existing urban areas into their rural surroundings or the development of new towns in former rural areas)

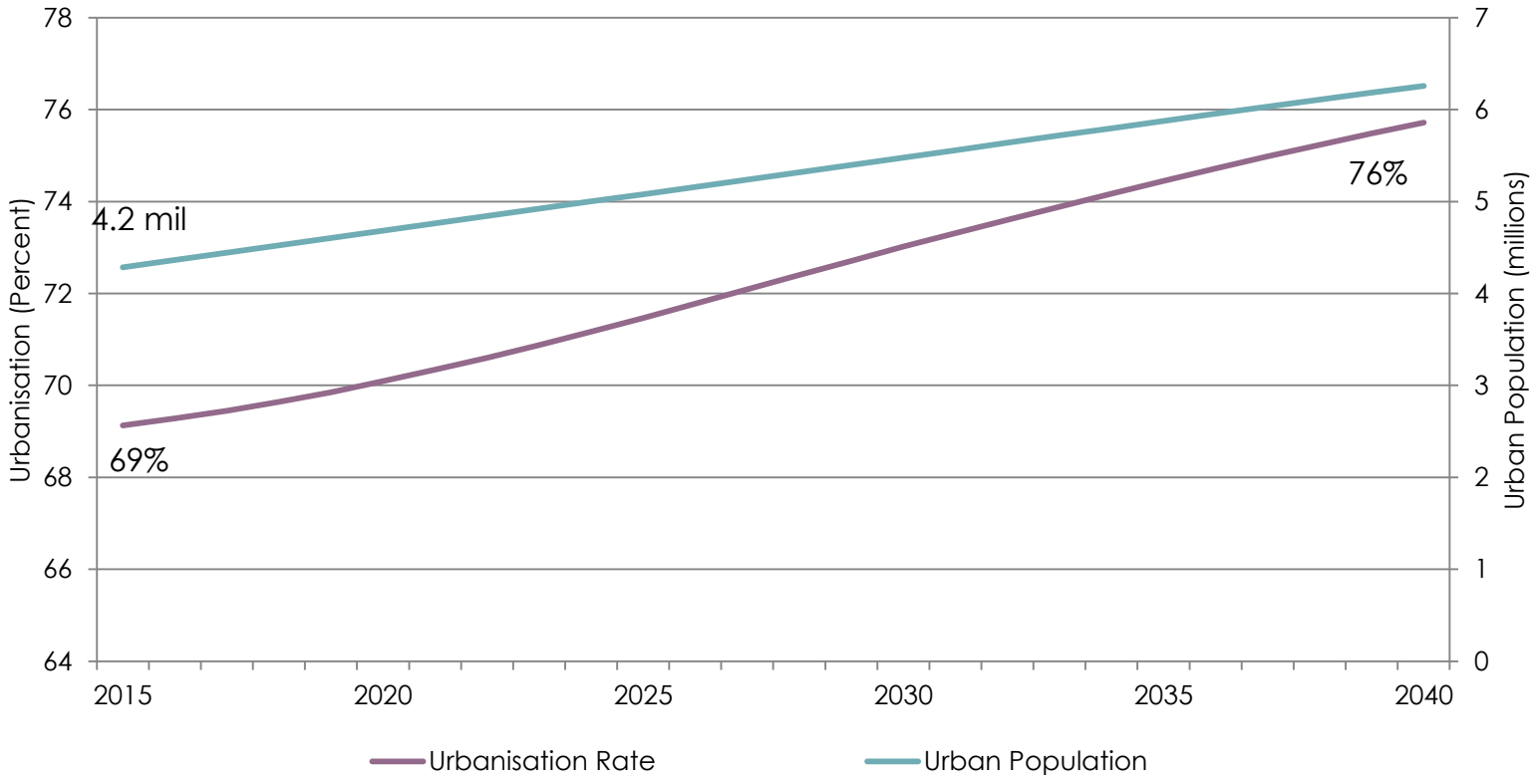
Demographic Forecasts – Western Cape

Population is expected to increase by just over 32% over the next 25 years (from 6.2 million in 2015 to 8.2 million in 2040)

The urban population is expected to increase from 4.2 to 6.2 million (an increase of 47.6% over the next 25 years)



Urbanisation – Western Cape



An even larger portion of the Western Cape population will be living in urban areas (nearly 76% of the population by 2040*

In 2015 approximately 62% of the South African population were living in urban areas**

- Source: FuturesCape, 2016
- ** Source: Gapminder, data source

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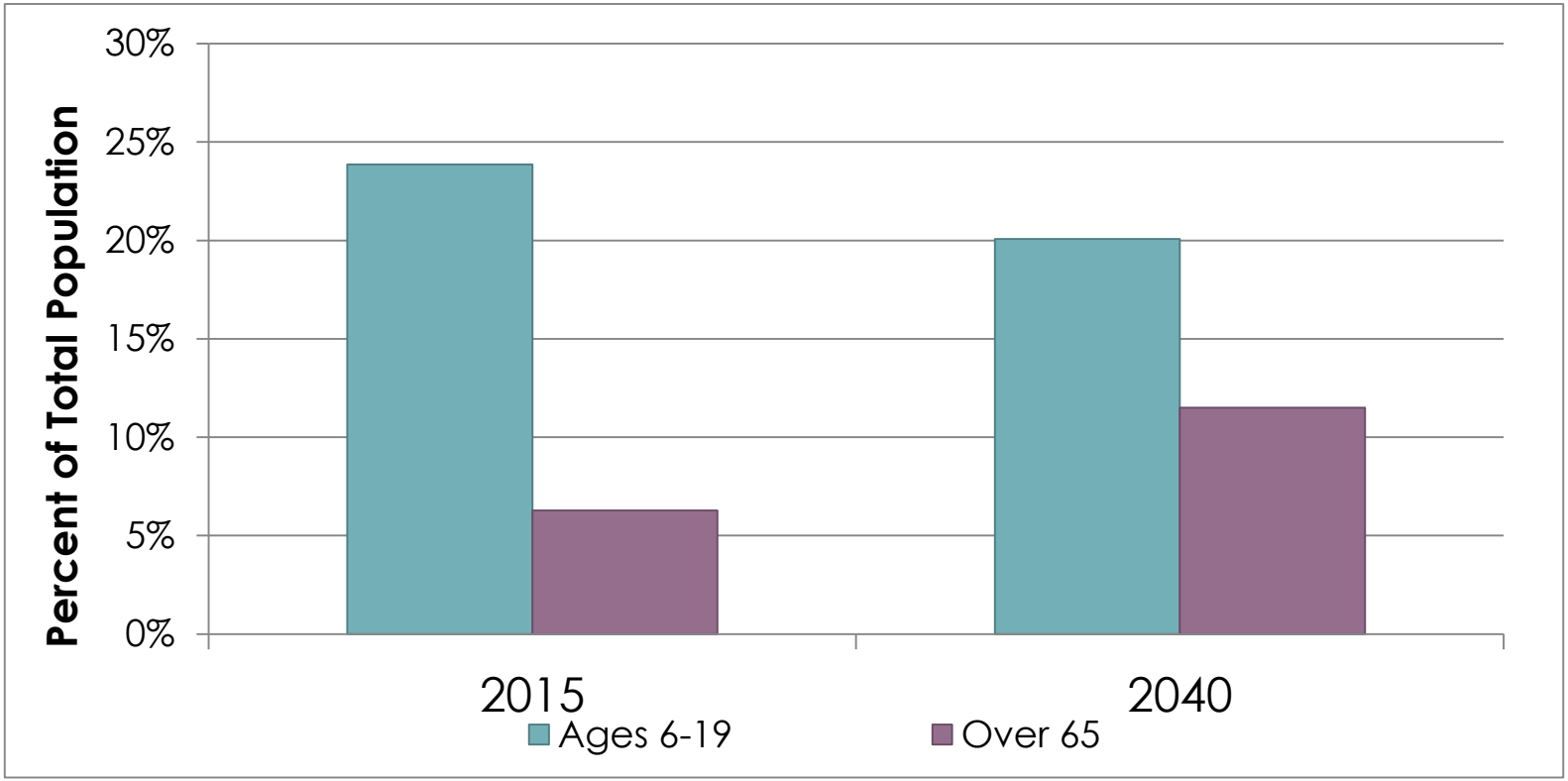
Youth and Pensioners – Western Cape

The number of individuals over 65 is forecast to more than double, from 389 000 to 949 000, by 2040

The number of school aged kids (6-19) is forecast to increase by 12% by 2040 (from 1.5 million to 1.65 million)

In 2040 pensioners will make up 11% of the total population, while school aged youth will make up 20 percent



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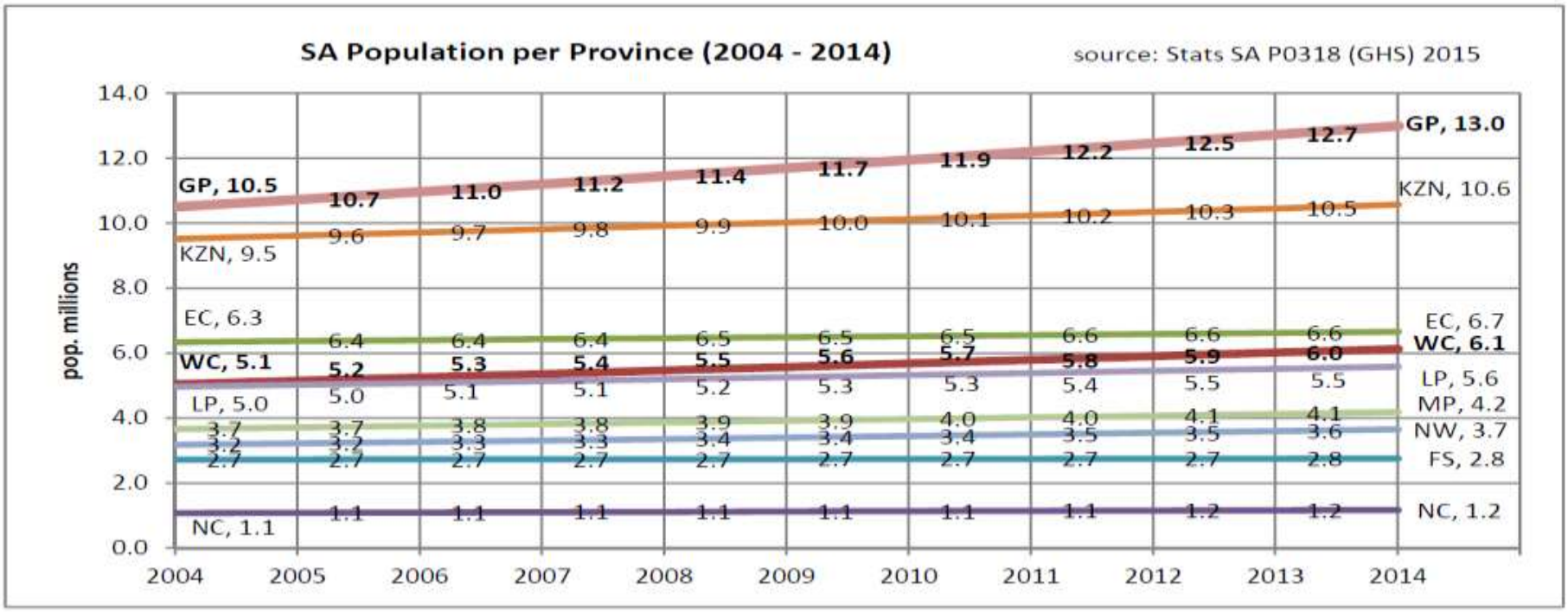
URBANISATION :- HOUSEHOLD FORMATION VS. POPULATION GROWTH



Western Cape population growth @ 19.0% [Drives need for health, education, recreational, social, etc. facilities]

Western Cape household growth @ 33.6% [Drives the need for access to basic services]

	Population				Households			
Prov.	2005 (mil)	2014 (mil)	pop. growth 2005-2014 (mil)	(%)	2005 (000's)	2014 (000's)	pop. growth 2005-2014 (000's)	(%)
WC	5.153	6.131	0.978	**19.0%**	1 307	1 720	413	**31.6%**
EC	6.371	6.656	0.285	4.5%	1 464	1 695	231	15.8%
NC	1.085	1.173	0.088	8.1%	248	312	64	25.8%
FS	2.728	2.758	0.03	1.1%	723	883	160	22.1%
KZN	9.616	10.571	0.955	9.9%	2 049	2 663	614	30.0%
NW	3.223	3.65	0.427	**13.2%**	901	1 177	276	30.6%
GP	10.731	12.996	2.265	**21.1%**	3 083	4 501	1 418	**46.0%**
MP	3.711	4.182	0.471	12.7%	852	1 168	316	**37.1%**
LP	5.022	5.585	0.563	11.2%	1 127	1 483	356	**31.6%**
RSA	47.64	53.701	6.061	12.7%	11 754	15 602	3 848	32.7%

Stats SA P0318 (GHS), 2015

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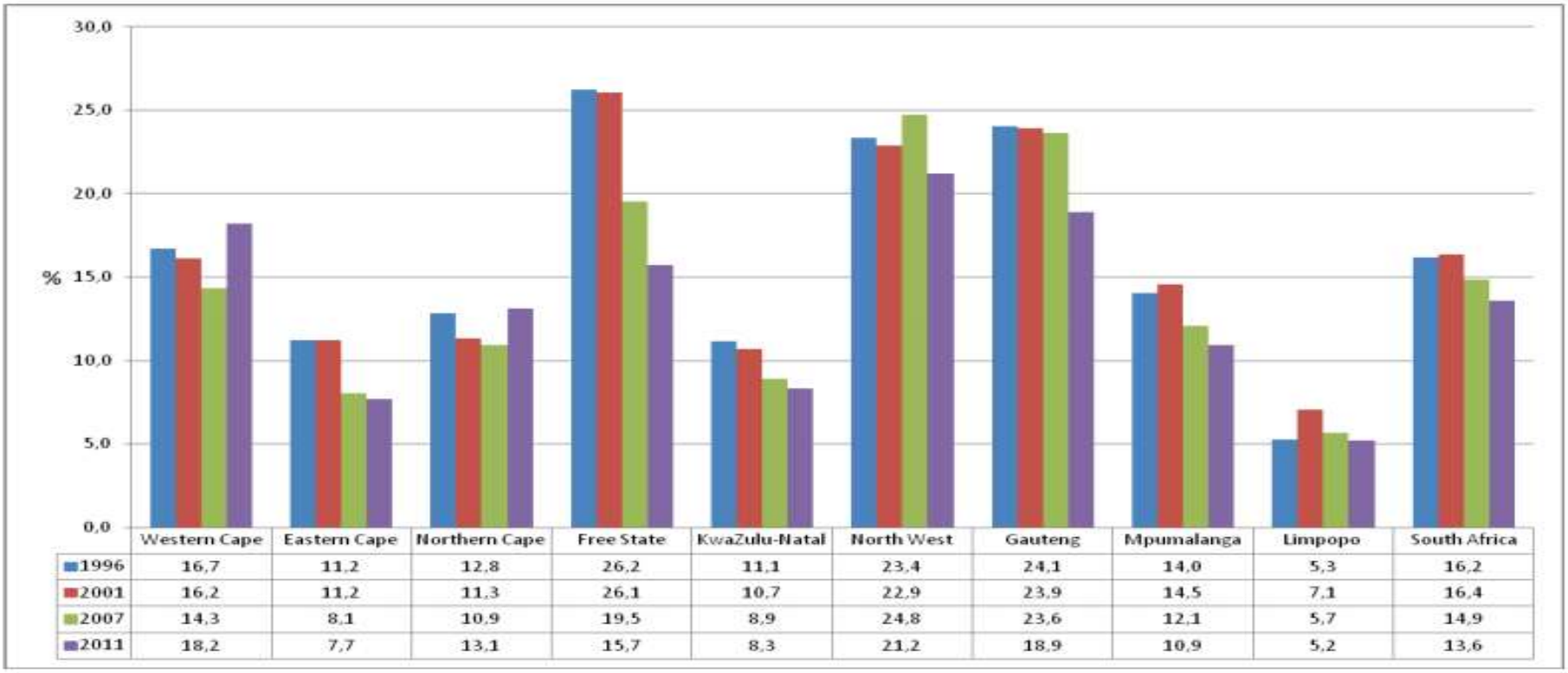
Relative changes in dwelling type per Province

Figure 3.3: Percentage of households living in informal type of dwellings by province: Census 1996, 2001, 2011 and Community Survey 2007 p26

Source: Statistics SA, Census 2011 Provinces at a Glance. Report No. 03-01-43



	Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu-Natal	North West	Gauteng	Mpumalanga	Limpopo	South Africa
1996	16,7	11,2	12,8	26,2	11,1	23,4	24,1	14,0	5,3	16,2
2001	16,2	11,2	11,3	26,1	10,7	22,9	23,9	14,5	7,1	16,4
2007	14,3	8,1	10,9	19,5	8,9	24,8	23,6	12,1	5,7	14,9
2011	18,2	7,7	13,1	15,7	8,3	21,2	18,9	10,9	5,2	13,6

The period 2007 to 2011 saw a remarkable increase in the percentage of households living in informal type of dwellings in the Western Cape – and increase of 3.9 percentage points.

All other Provinces experienced a decrease in percentage of households living in informal type dwellings (Northern Cape the exception with a 2.2% movement).

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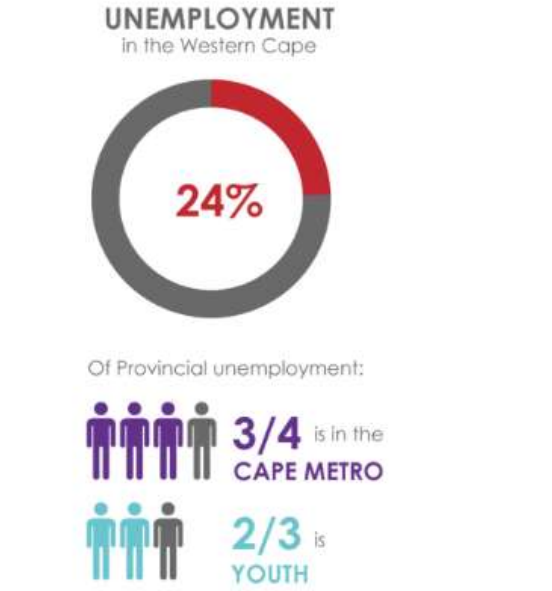
Context

Receiving Environment

- By 2030 → 750 Global Cities
- Majority of growth within Cape Metro / City Region & Southern Cape (George, Mossel Bay, Bitou)
- Informality, basic services backlog & poverty = remains a reality
- Socio-economic current truths & Ecological Services Endowment



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URBANISATION ASPECTS

CITY-MAKING

NEW DEVELOPMENTS

INFORMAL SETTLEMENTS

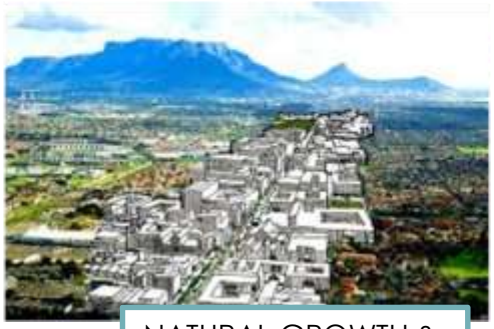
RECLASSIFICATION – FORMAL

LIVE
WORK
PLAY

INFILL

INFRASTRUCTURE & AMENITIES

NEW DEVELOPMENTS



NATURAL GROWTH & CITY-MAKING

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URBANISATION = SOCIAL-ECOLOGICAL SYSTEM

Built Env

Eco-System

Integration ≠ silos

\+

HUMAN

=

SOCIAL – ECOLOGICAL SYSTEM (SES)

Integrated system of ecosystems and human society

➔ **reciprocal feedback and interdependence**

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SUSTAINABLE DEVELOPMENT

"Sustainable development, then, is about recognizing and accepting our responsibilities not just for where we live, but more widely for the environment at a global scale. In order to do this we need to look beyond the environment itself, to the broader economic, social, and political systems within which human decisions are made. Fundamentally, sustainable development requires not just altering behaviour patterns in relation to the environment, but **about changing the broader systems that shape human behaviour.**"

Haughton 1999: 234

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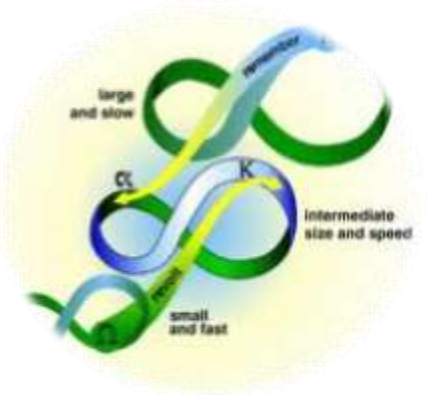
SOCIAL ECOLOGICAL SYSTEMS are COMPLEX ADAPTIVE SYSTEMS

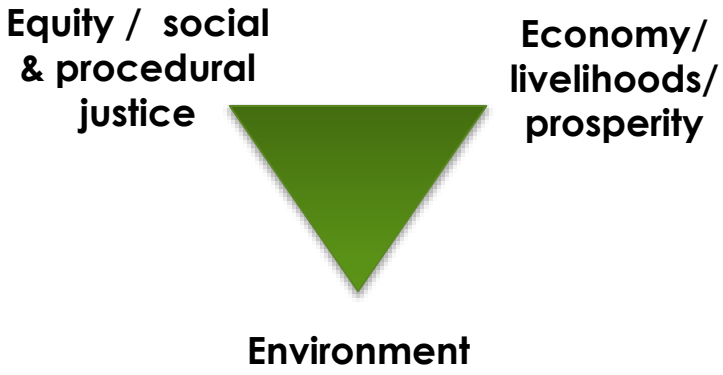
COMPLEX ADAPTIVE SYSTEMS REQUIRE ADAPTIVE MANAGEMENT APPROACHES

→ Simple Rules : Complex Behaviour
→ Self-organising : Different times and geographic scales
→ Feedback loops requires constant adaptation
→ Non-linear
→ Cannot know it all



SUSTAINABLE DEVELOPMENT:

→ normative (what we *ought* to do
→ to achieve *desired* outcomes)
→ No 1 size fits all – innovation response to urbanisation



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Spatial Manifestation of Growth

- Spatial Performance Monitoring & Management -

- New SPLUM dispensation
- Point of access to immense opportunities
- How we use it will determine how history will view our legacy

Never before has the need for delivery of empirical and scientific evidence been more important!

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- DPIM&R + Collective-

What is SPLUMA about?

80 + years

A single Spatial Planning System for the country

Principles

Policies and legislation

Spatial development planning & frameworks

Land use management through schemes

Land development (applications)

Some other provisions

What is SPLUMA about?

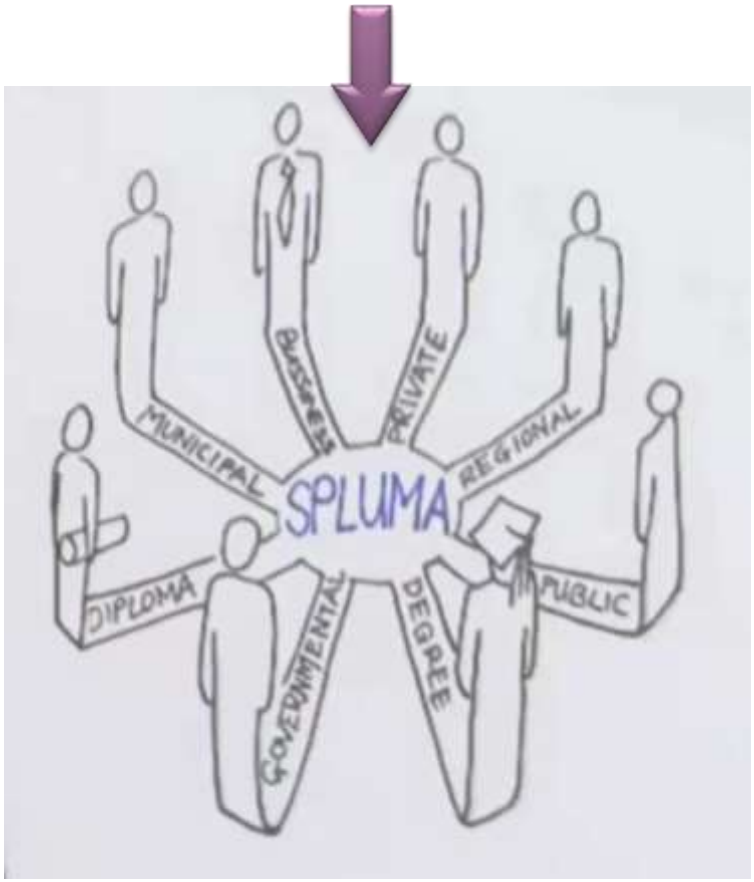
≠ Procedural compliance (the case historically).

✓ Substantive compliance

A normative approach to spatial planning and land use management

Achieved through "giving effect to" the SPLUMA principles

Depends → Relationships



SPLUMA PRINCIPLES

- The principle of spatial justice
- The principle of spatial sustainability
- The principle of efficiency
- The principle of spatial resilience
- The principle of good administration

[Encapsulates the entire system of government]

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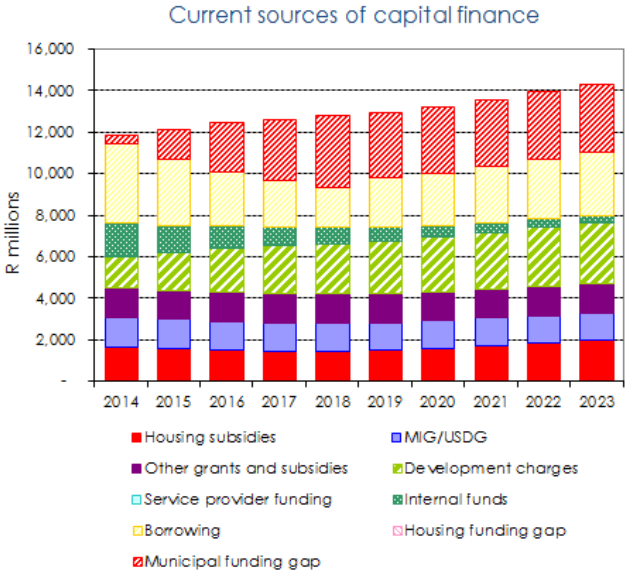
MUNICIPAL FINANCIAL SUSTAINABILITY OF SPATIAL GROWTH PATTERNS

PSDF Specialist Study 3
How?

- Financial and economic evidence to support the spatial policies of **compaction**, **integration** and **densification**
- Comparing the **up-front** and **on-going costs** of dispersed vs compact urban development
- Comparing **the non-financial costs** associated with two growth models (loss of productive, cultural, scenic and/or biodiversity landscapes)



- **R24 billion** additional capital required over the next 10 years with funding shortfalls
- To break even some municipalities would have to increase rates and tariffs by **up to 4% above** inflation every year to keep up with rising costs
- Low income households will have to spend up to **18% more** for transport
- **33%** average increase in carbon emissions from transport

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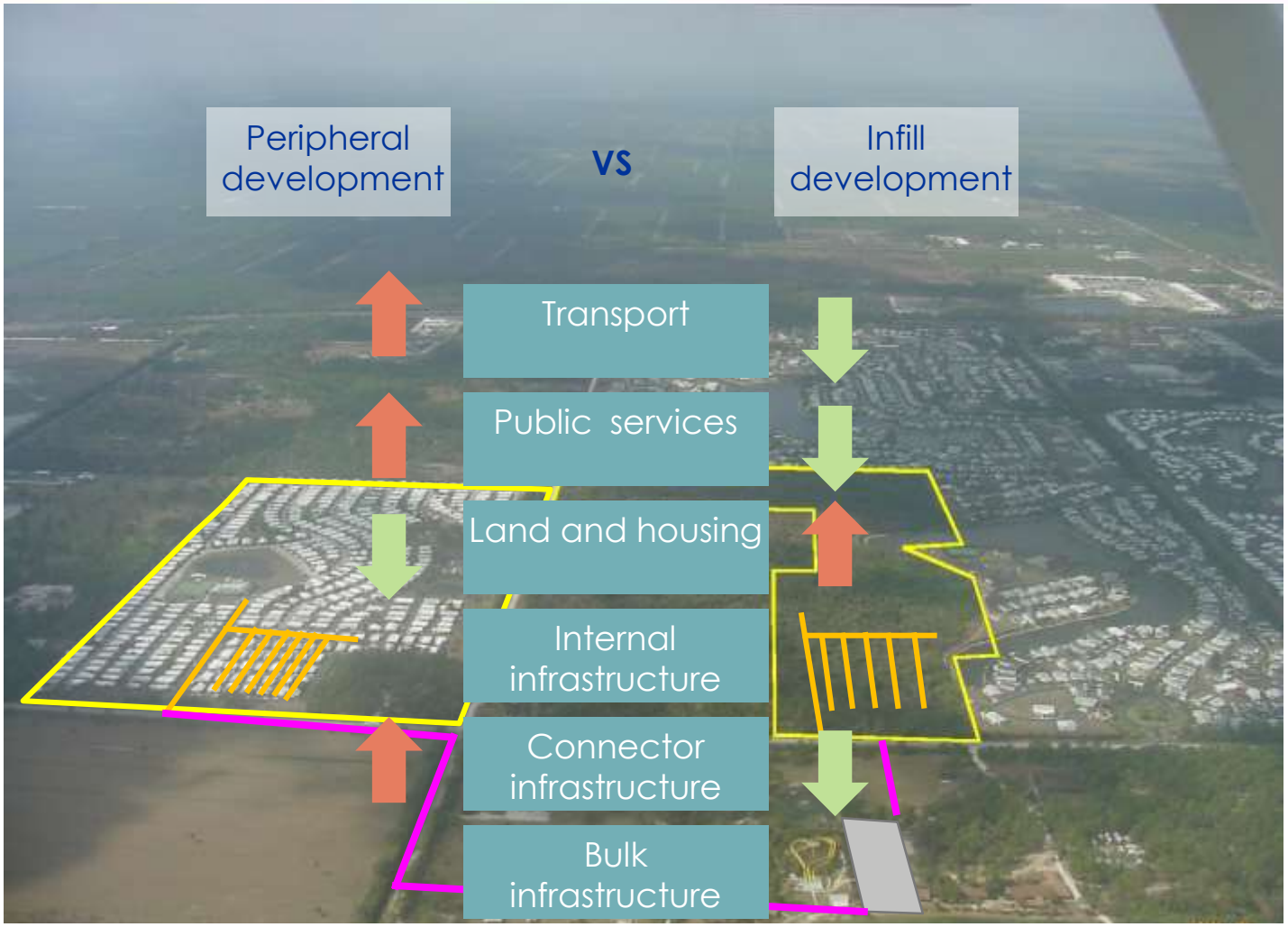
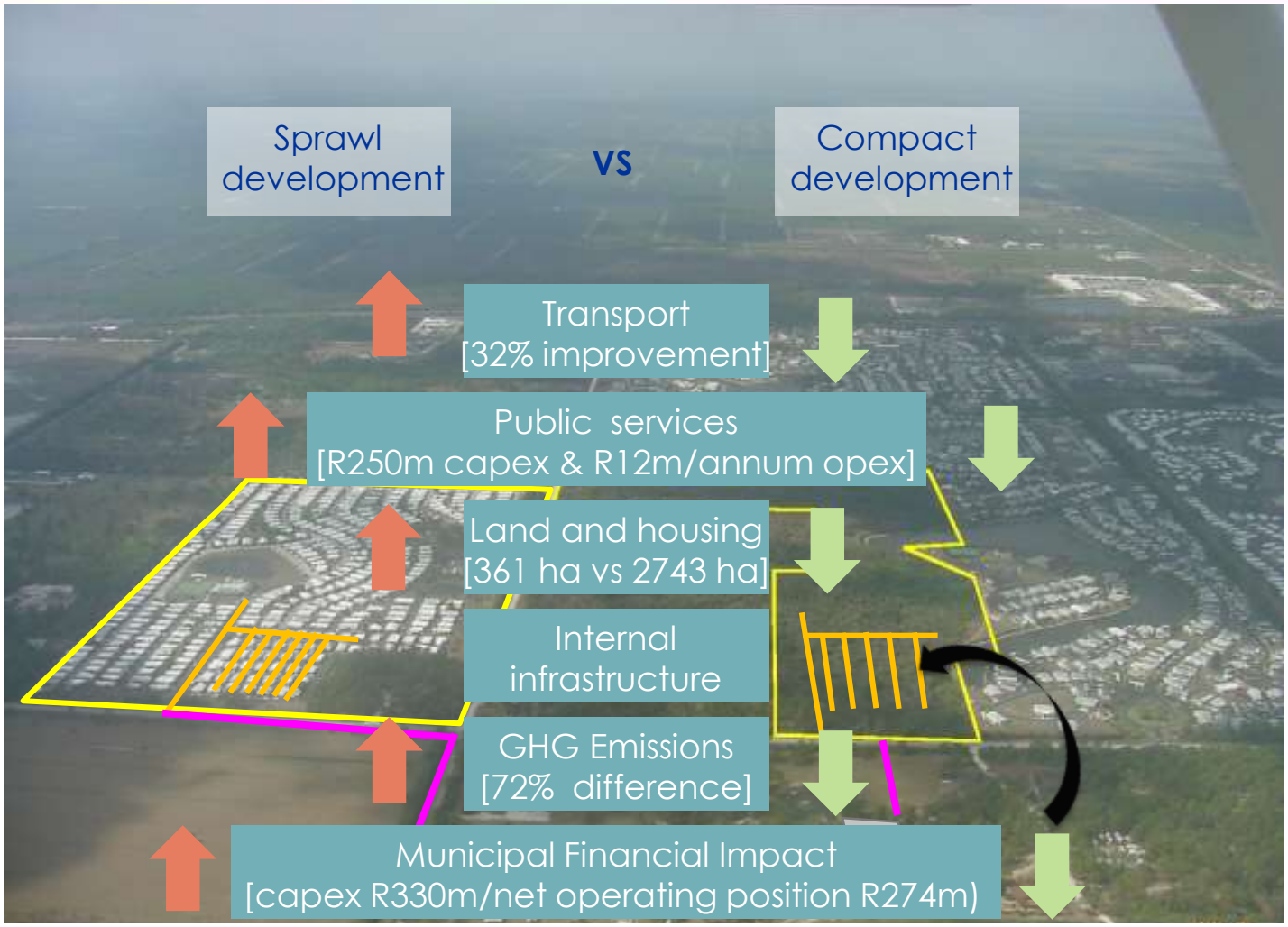
HOW DO COST VARY IN SPACE?



- …spatial and resource inefficiencies have serious negative consequences for the environment, but also for government finances (particular municipal finances) and for household livelihoods

Mossel Bay Growth Scenarios - Comparisons



- …spatial and resource inefficiencies have serious negative consequences for the environment, but also for government finances (particular municipal finances) and for household livelihoods

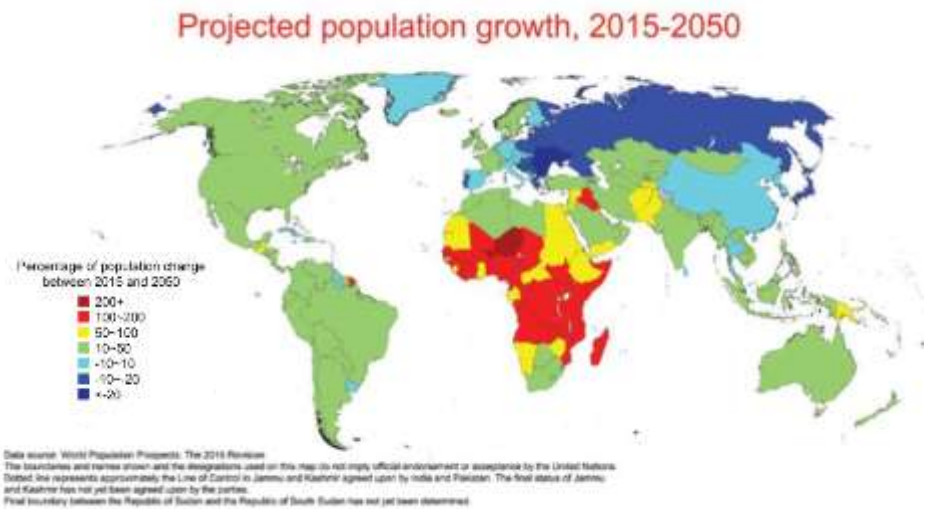
SOUTH AFRICA

URBANISATION IN SPATIAL CONTEXT

- Global
- National
- Provincial

GLOBAL GROWTH TRENDS:- BY REGION

South African Population Change 1980-2015 [50-100%] | 2015-2050 [10-50%]



1. 2015, world population reached **7.3 billion → 11 billion** In 2016, 83 million people+
2. **Continued population growth** until 2050 ➔ Rest of World and Africa
3. **Africa population** growth continues to experience very high rates → 2015-2050 populations of 28 African countries projected to more than double – vast majority of people on Continent will stay in settlements and medium sized cities.
4. **2015 - 'PINCODE' of the world = 1114 | 2050 - 'PINCODE' of the world = 1125**
   THEN 2100 – 'PINCODE' of the world = 1145
5. **Growth will be in Sub-Sahara!**

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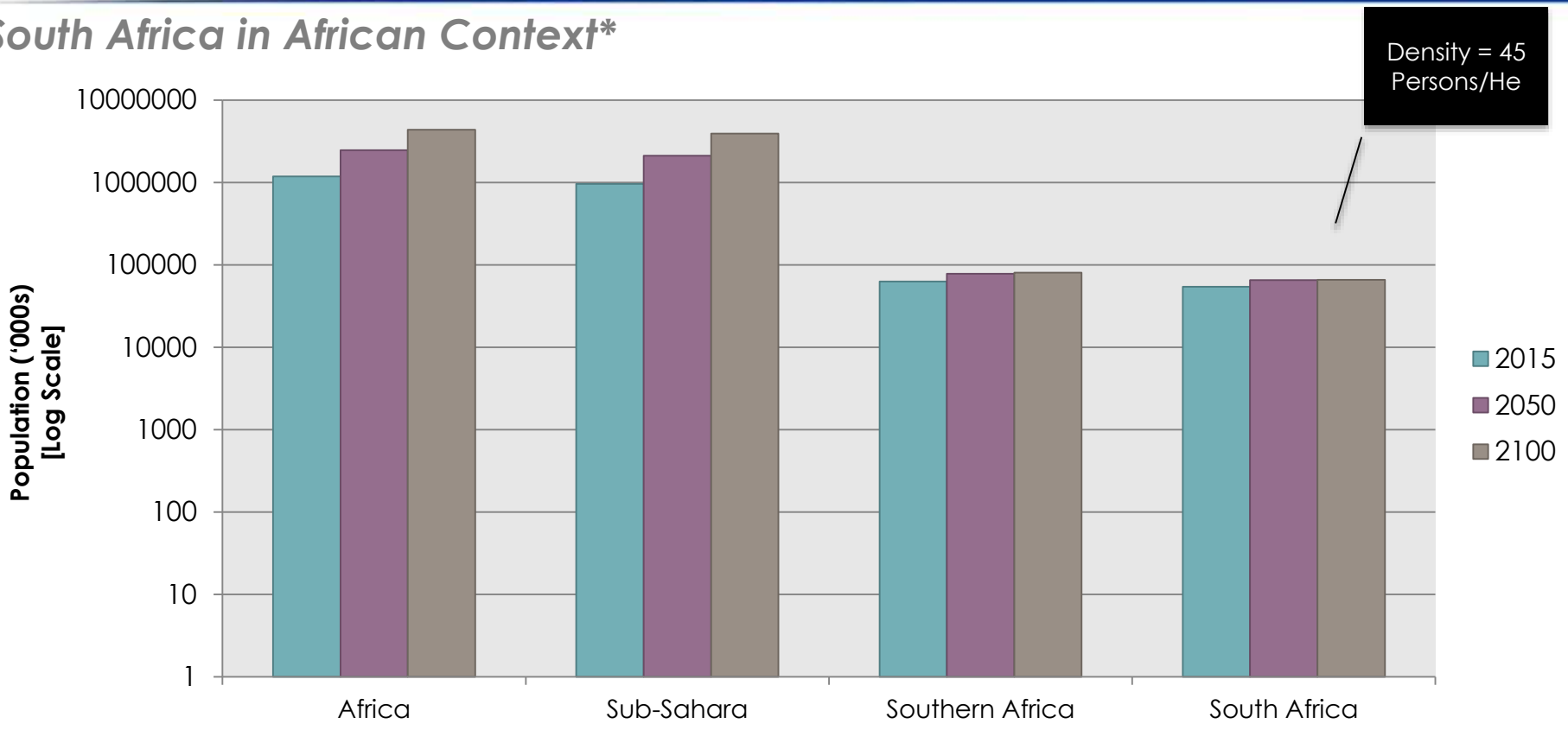
1. * United Nations World Population Report **2015**

South(ern) African Context

*South Africa in African Context**



	2015 [%]	2050 [%]	2100 [%]
Africa			
Sub-Sahara	81.1%	85.7%	89.7%
Southern Africa	6.5%	3.7%	2.1%
South Africa	87.0%	84.0%	81.4%

	2015	2050	2100
Africa	1 186 178	2 477 536	4 386 591
Sub-Sahara	962 287	2 123 232	3 934 828
Southern Africa	62 634	78 029	80 737
South Africa	54 490	65 540	65 696

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* Source information from: United Nations World Population Report 2015

South African Cities' Growth Prospects

Size and Spatial Distribution of Urban Centres of Growth

United Nations • Department of Economic and Social Affairs • Population Division • www.unpopulation.org

Urban Agglomerations 2014

Urban agglomeration	Country	Population (millions)			Rank*			Average annual rate of change (percentage)		2014 population residing in agglomeration, as percentage of	
		1990	2014	2030	1990	2014	2030	2010–2015	2025–2030	Total population	Urban population
Johannesburg	South Africa	3.7	9.2	11.6	48	35	34	3.2	1.0	17.3	26.9
Cape Town	**South Africa**	**2.2**	**3.6**	**4.3**	**103**	**106**	**131**	**1.8**	**1.1**	**6.8**	**10.6**
Durban	South Africa	1.7	2.9	3.3	136	147	178	1.1	1.1	5.4	8.5
Pretoria	South Africa	0.9	2.0	2.7	290	225	224	4.2	1.2	3.7	5.8
Port Elizabeth	**South Africa**	**0.8**	**1.2**	**1.4**	**311**	**396**	**438**	**1.3**	**1.3**	**2.2**	**3.4**
Vereeniging	South Africa	0.7	1.1	1.4	338	412	442	1.5	1.3	2.2	3.4

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PWC POPULATION PROJECTIONS: 2011-2040

Western Cape Population Projections
2011 - 2040

March 2014 pwc

6.97 million people in 2030

7.36 million in 2040

The population in the Western Cape Province is expected to grow from **5.83 million** individuals in **2011 to 7.36 million** individuals in **2040**

4,42 million people in 2030

Cape Town is Expected to grow from 3,74 million individuals in 2011 to 4,63 million individuals in 2040

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Big City Blow-Out

PWC Population Estimates

STEPSA – main trends

Change Detection – Hotspot A

GPS2013

- **By 2030 CoCT population = 4.42mil**
- **By 2030 WC Province population = 6.9mil**
- ***3 Lead Growth Districts Account for 30% of future growth. CoCT account for 58% of future growth***
- **West Coast / Winelands and Overberg = 3 lead growth districts**
- **Keep close watch on Overstrand**

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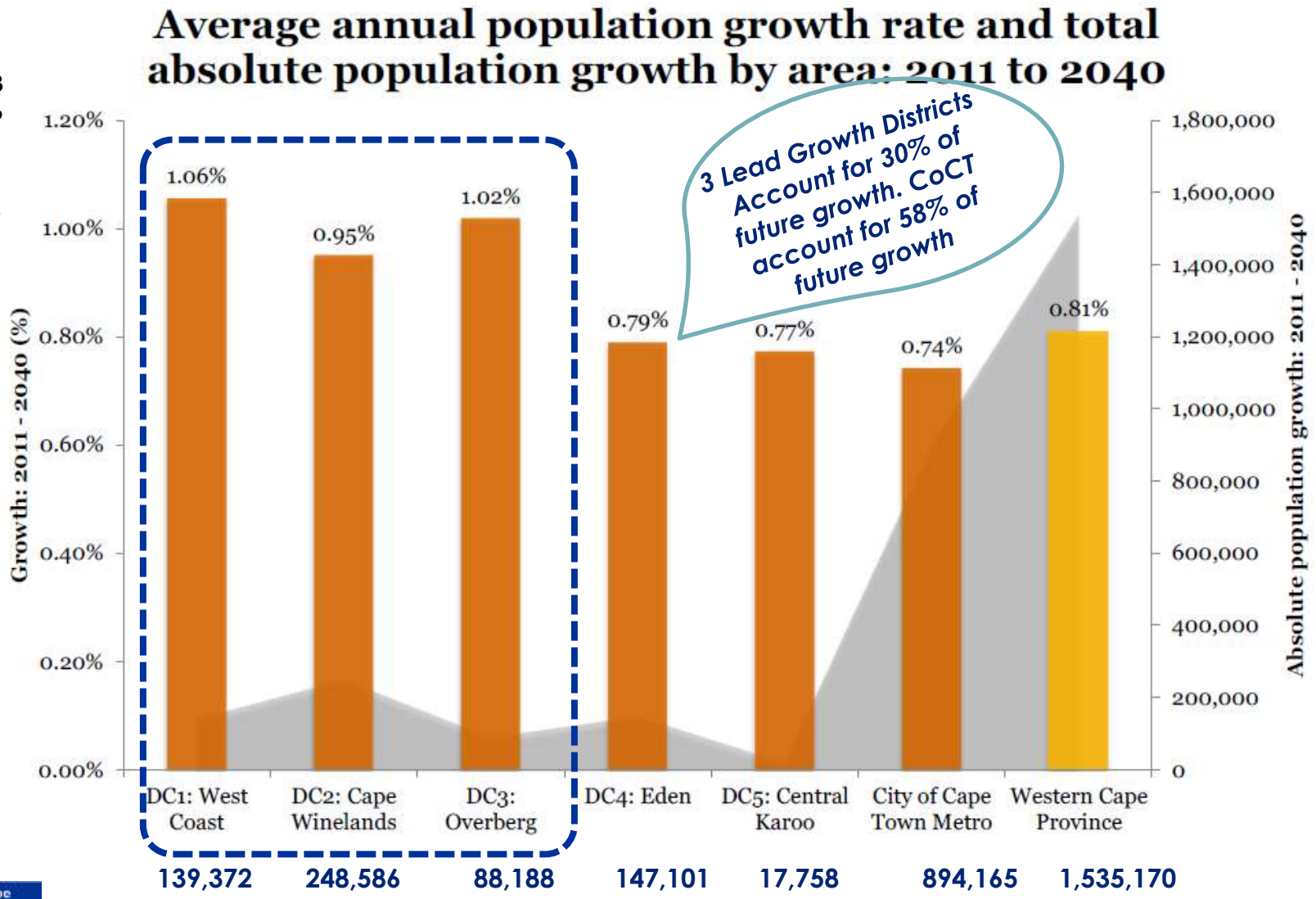
PWC POPULATION GROWTH & PROJECTIONS: 2011-2040

Census 2011:

WCDM : 391,773
CWDM : 787,486
ODM: 258,178
EDM: 574,266
CKDM: 71,003
CoCT: 3,740,037
WCP: 5,822,742



Absolute Growth: 2011-2040

PWC POPULATION GROWTH & PROJECTIONS: 2011-2040

Highest Actual Growth outside CoCT:

❶ Drakenstein
❷ Stellenbosch
❸ George

Highest % Growth outside CoCT:

① Bitou
② Saldanha Bay
③ Overstrand

District	#1 [Actual Growth] % Growth	#2 [Actual Growth] % Growth	#3 [Actual Growth] % Growth
WCDM	**Saldanha Bay ②** [48,449] 1.38%	Swartland [35,650] 0.94%	Bergrivier [23,429] 1.11%
CWDM	**Drakenstein ❶** [85,650] 0.98%	**Stellenbosch ❷** [69,123] 1.23%	Witzenberg [38,876] 0.97%
ODM	**Overstrand ③** [38,440] 1.36%	Theewaterskloof [33,287] 0.92%	Swellendam [9,390] 0.80%
EDM **[Note: Oudtshoorn [-5538]**	**George ❸** [62,616] 0.97%	Mosselbay [33,605] 1.11%	**Bitou ①** [26,256] 1.49%
CKDM	Beaufort West [14,242] 0.87%	Prince Albert [3,509] 0.82%	Laingsburg [7] 0%

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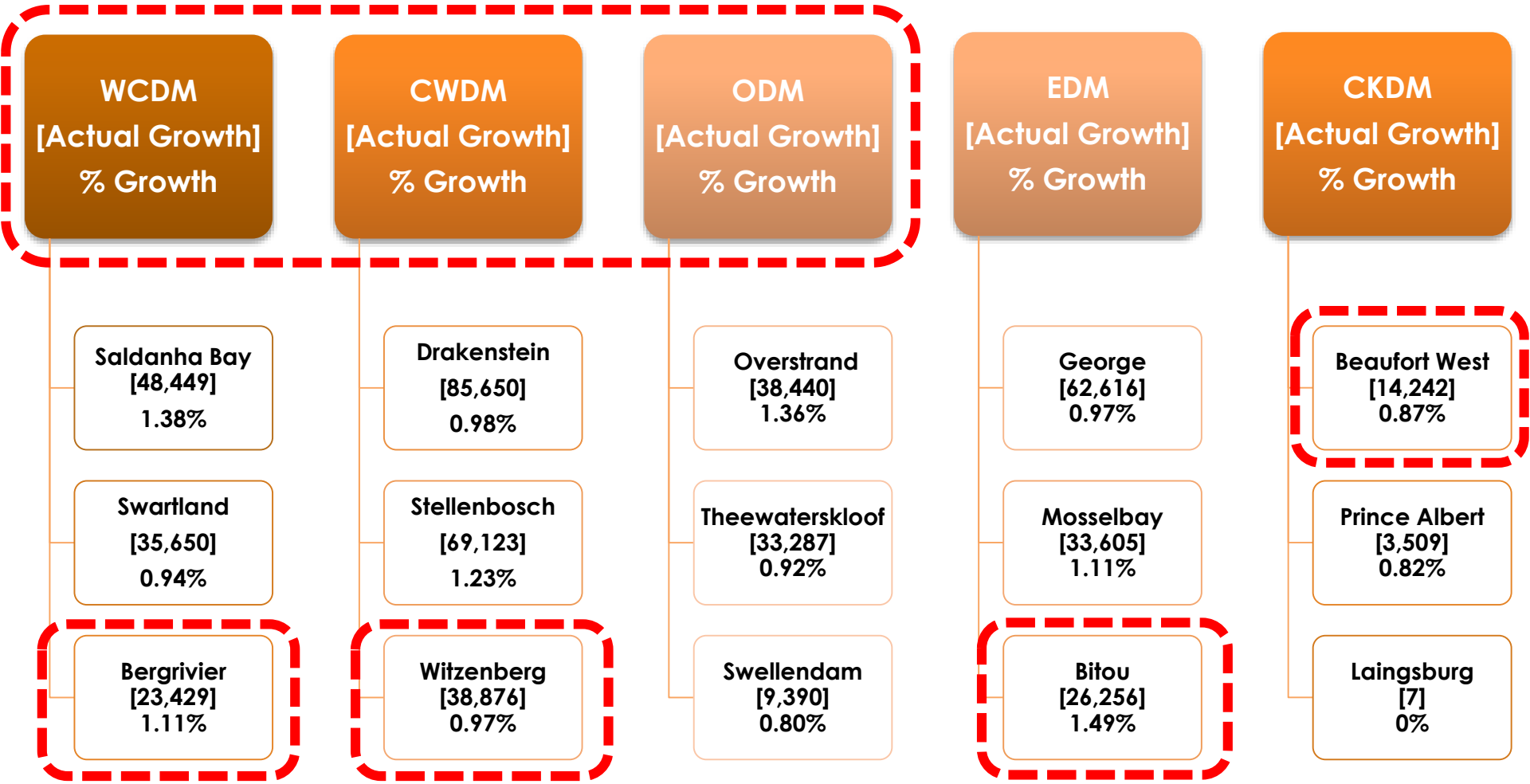
POPULATION GROWTH & PROJECTIONS: 2011-2040



Source: PWC Population Projections 2011-2040

Change detection

Main aim

Detecting hot spots of building growth changes in development within the Western Cape Province

Objectives

- To detect areas of change and rate of change
- To indicate spatial patterns of change versus high density unchanged areas
- To indicate building growth trends

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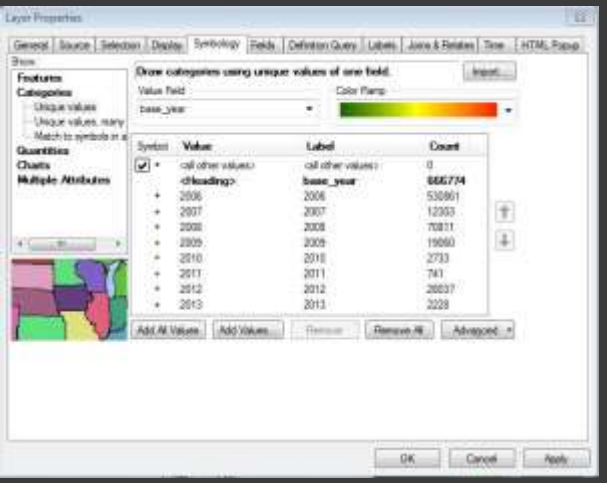
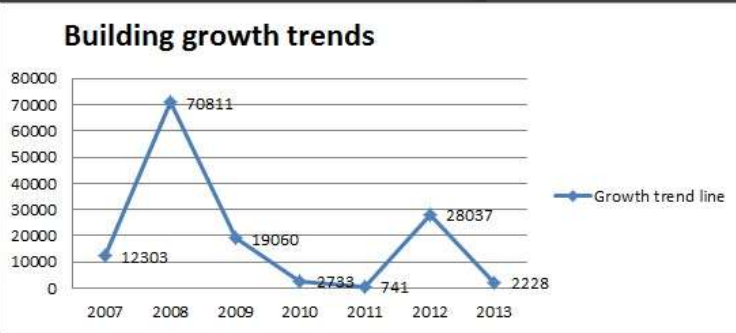
- Trend analysis for City of Cape Town municipality



Spot 5 building count point classification



Data fluctuation changes indicating years of change and differenced amount of change

Work

flow

- Y axis : North to South

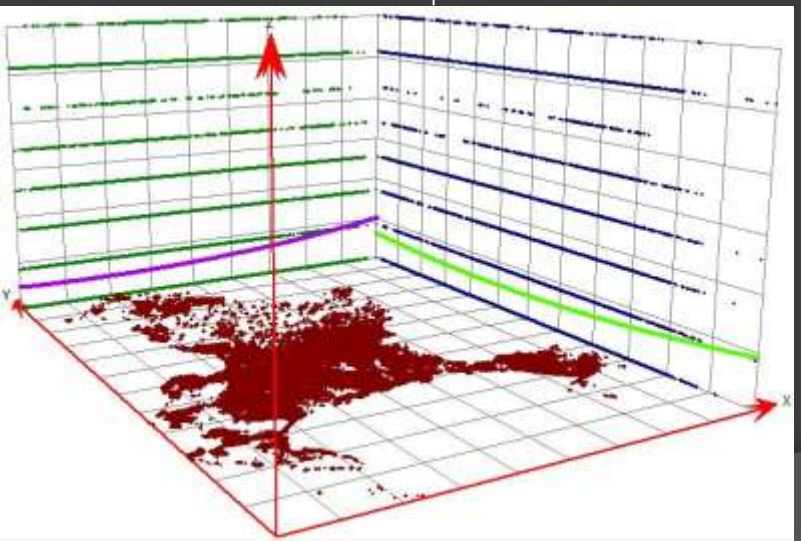
-Direction: West to East

-Change: Low value buildings on West and Higher to East

- X axis : East to west

-Direction: North to South trend

-Change : Central Low values buildings and high value on the South



Spatial classification of change areas

- Covariance modelling
  - Covariance parameters

-Input data : SBC –base year
-Surface output : prediction
-Kriging type : Simple
-Search direction : true
-Show all points : Binned and averaged

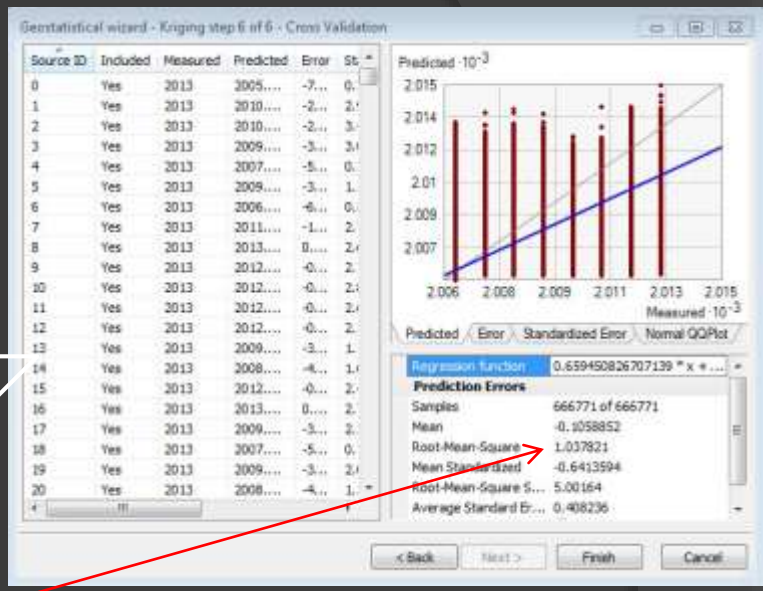
  - Search neighbourhood

-Maximum : 5 points
-Minimum : 2 points
-Sectors : 4 sectors
-Neighbourhood type : smooth factor= 0.2

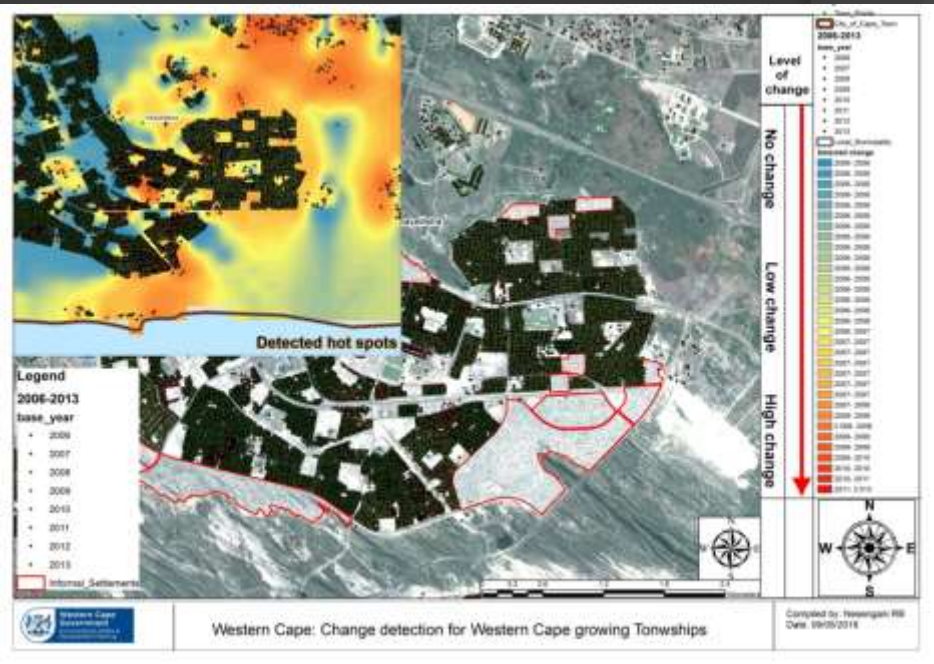
  - Accuracy assessment of output results

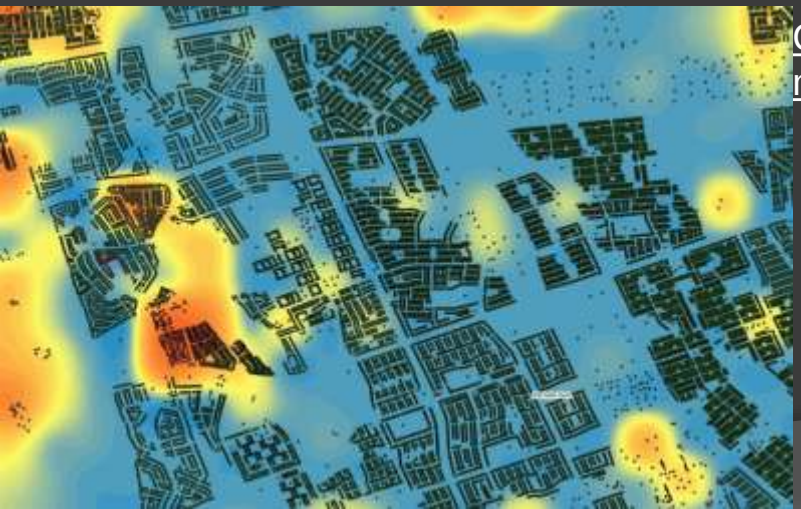
- Root mean square observed : 1.03

Cross validation



Out put model map



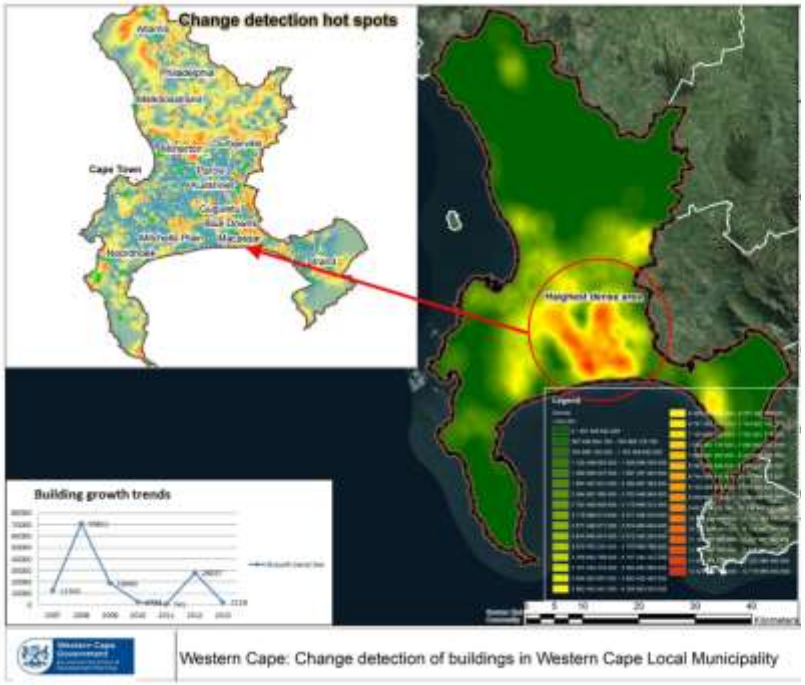


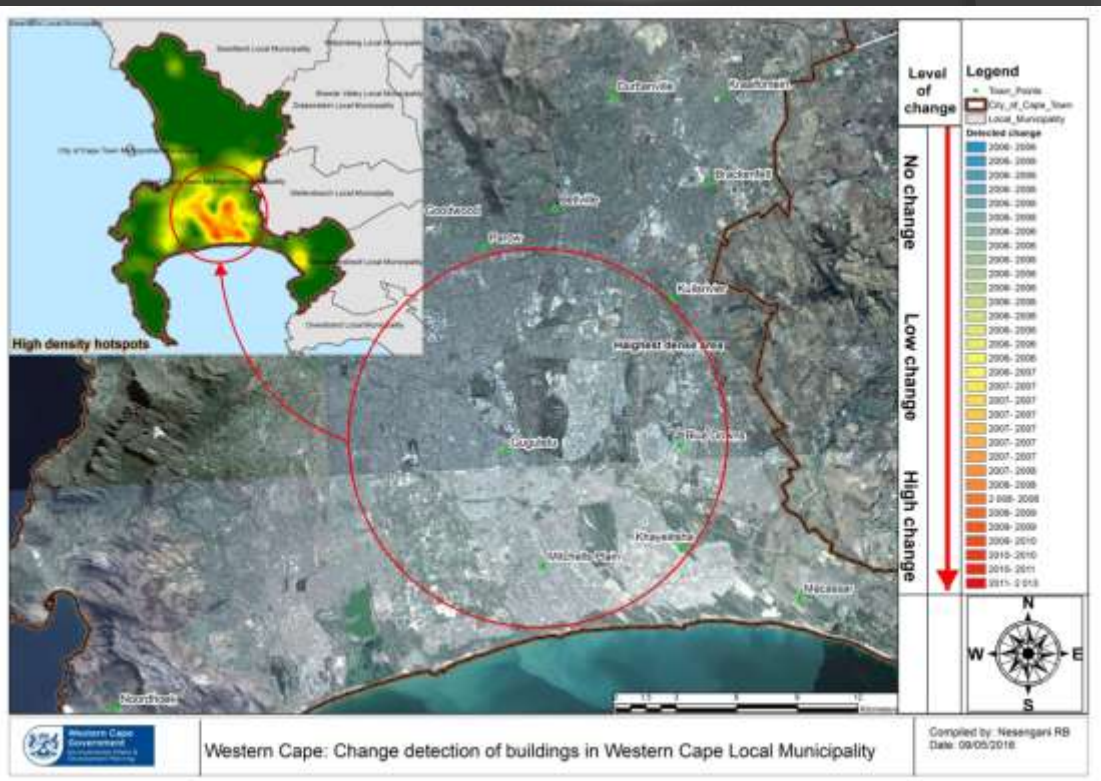
Covariance model

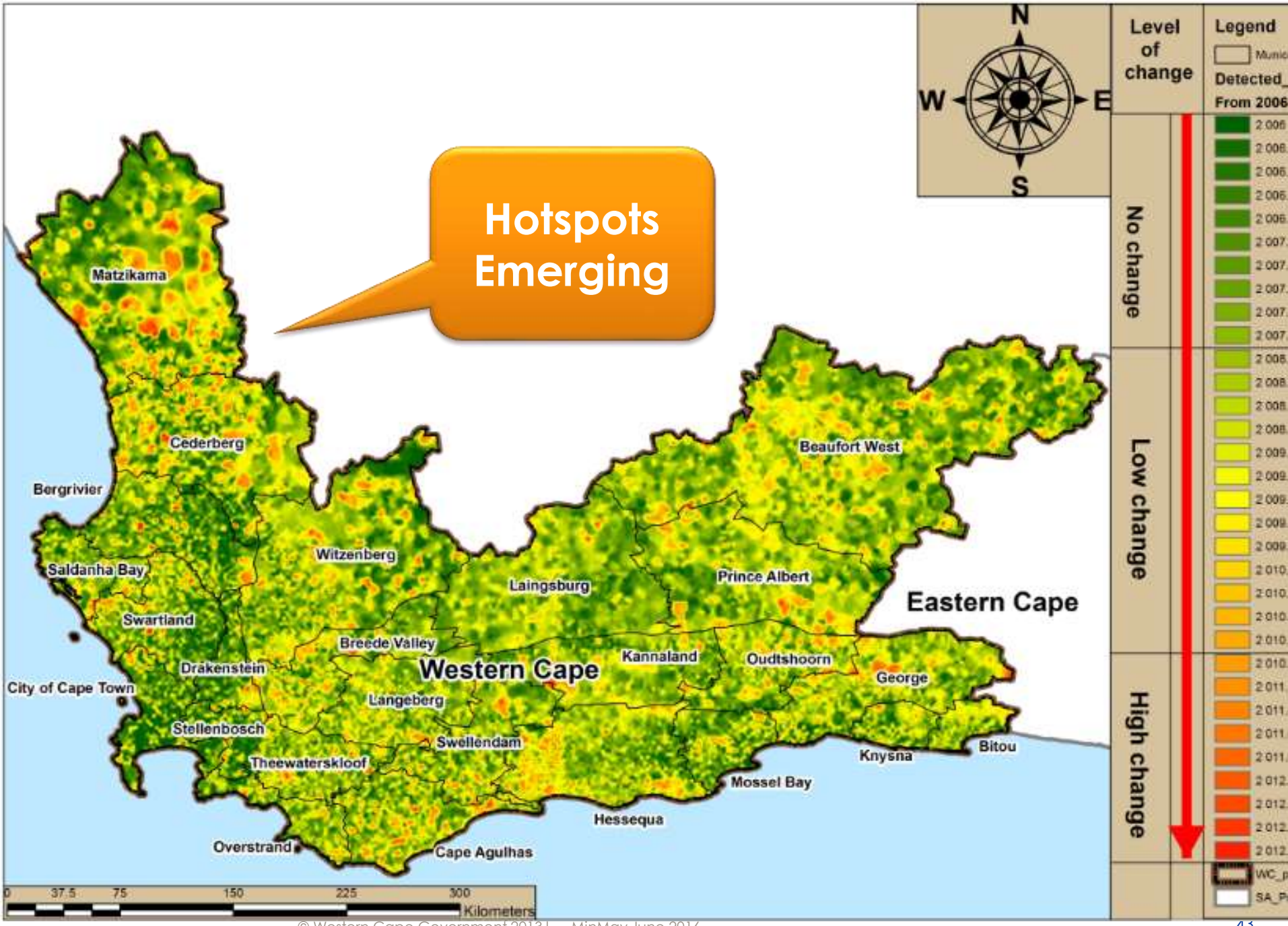
- Building density
- SBC point density

- Density= $\frac{\text{number of buildings}}{\text{area}}$

Point density of a given area over mapping scale in km²

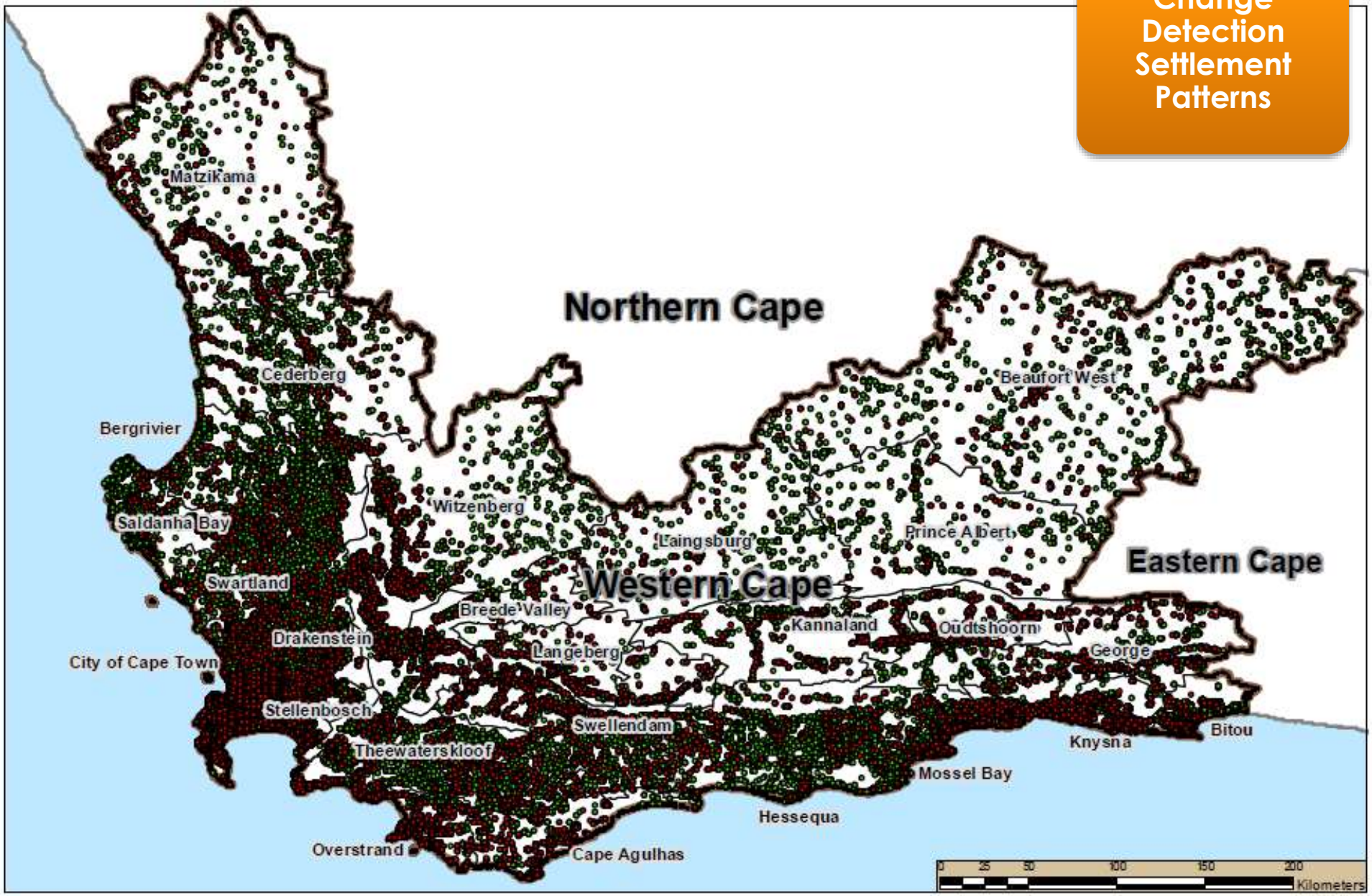





Hotspots Emerging
N
W
E
S
Level of change
No change
Low change
High change
Legend
Detected_
From 2006
Matzikama
Cederberg
Bergrivier
Saldanha Bay
Swartland
Witzenberg
Laingsburg
Beaufort West
Prince Albert
Eastern Cape
Breede Valley
Drakenstein
Western Cape
Kannaland
Oudtshoorn
George
City of Cape Town
Langeberg
Stellenbosch
Swellendam
Theewaterskloof
Knysna
Bitou
Mossel Bay
Hessequa
Overstrand
Cape Agulhas
0 37.5 75 150 225 300
Kilometers

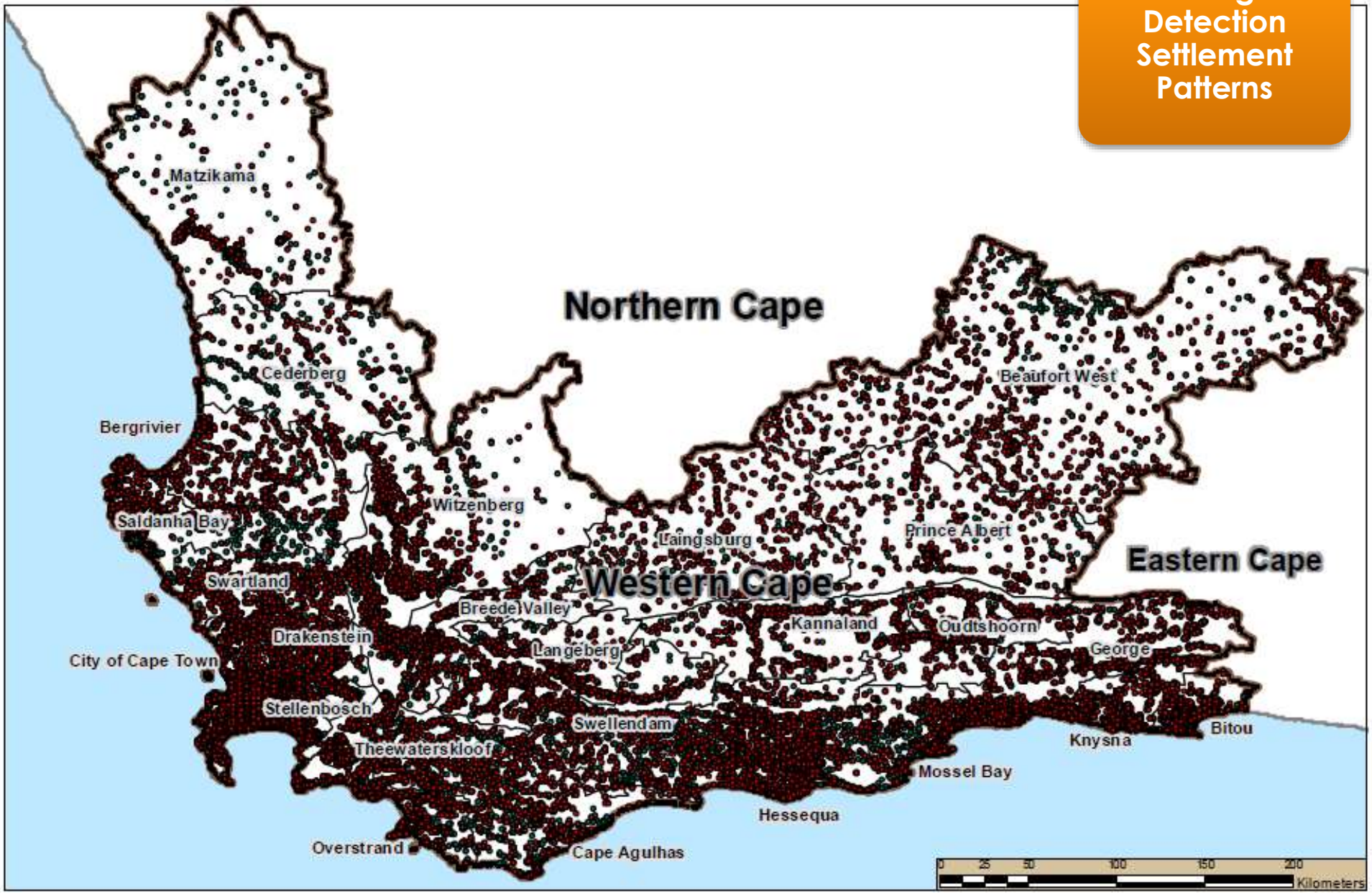
Spatial Distribution of SBC:- 2006 = green / 2007 = red

Change Detection Settlement Patterns



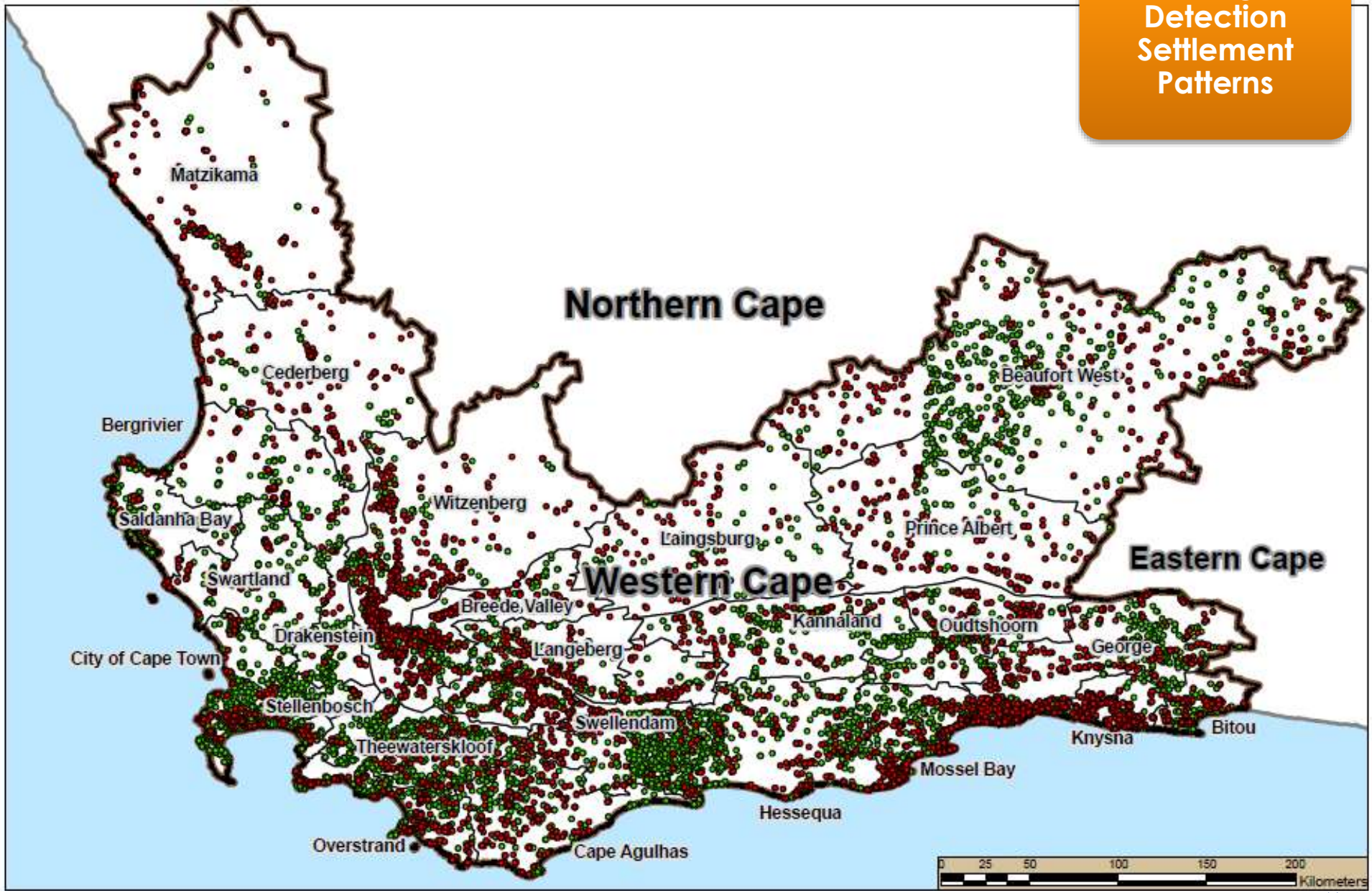
Spatial Distribution of SBC:- 2008 = green / 2009 = red

Change Detection Settlement Patterns



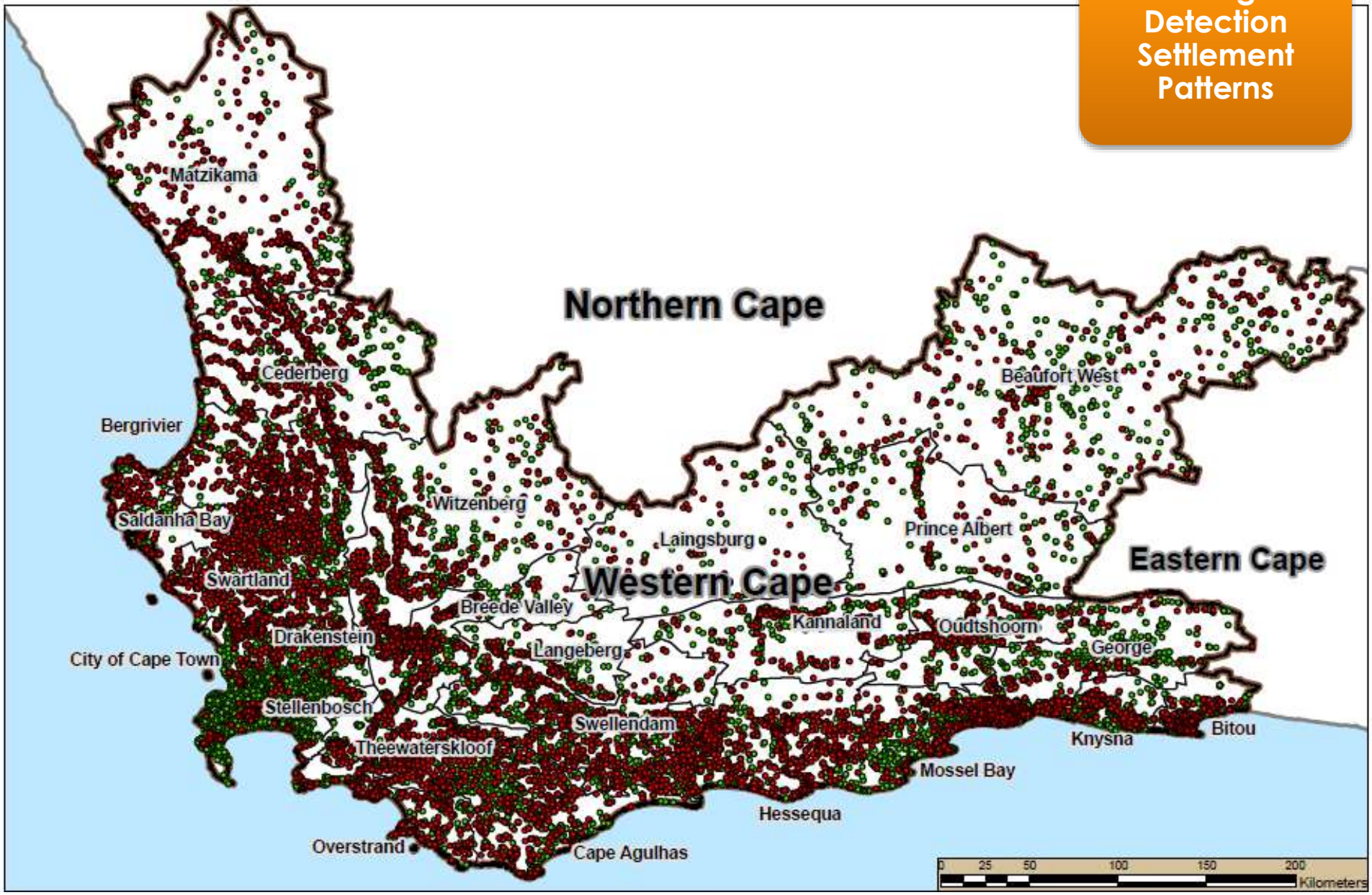
Change detection green = 2010 / red = 2011

Change Detection Settlement Patterns

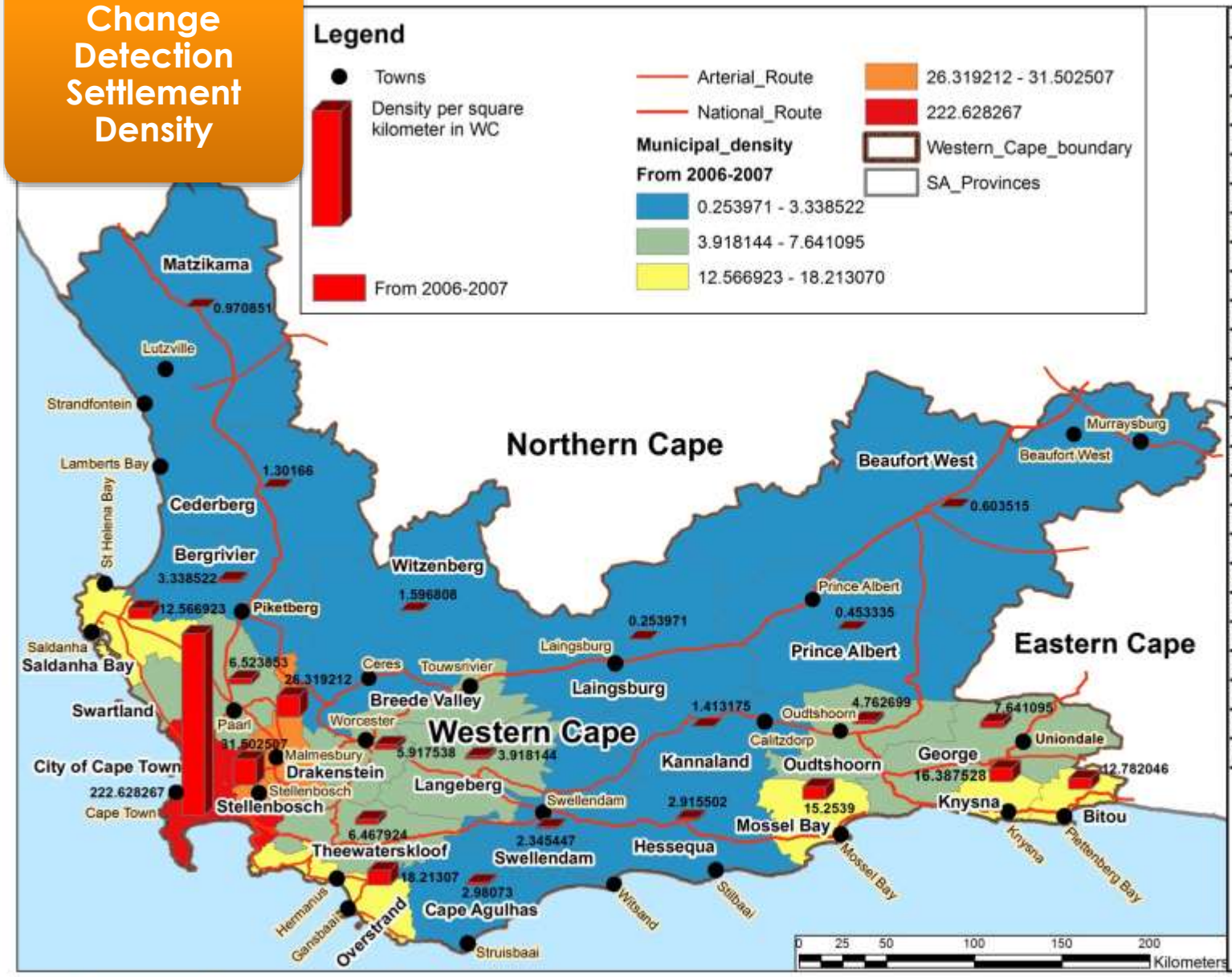


Change detection green = 2012 / red = 2013

Change Detection Settlement Patterns



Change Detection Settlement Density



MUNICNAME	2006	2007
Beaufort West	12545	682
Bergrivier	14009	704
Bitou	11943	735
Breede Valley	21730	955
Cape Agulhas	9112	1221
Cederberg	10096	327
City of Cape Town	530861	12303
Drakenstein	39818	652
George	38042	1623
Hessequa	16076	640
Kannaland	6273	451
Knysna	16987	1183
Laingsburg	1986	245
Langeberg	16108	1593
Matzikama	11653	950
Mossel Bay	29632	1041
Oudtshoorn	16166	680
Overstrand	29691	1408
Prince Albert	3581	115
Saldanha Bay	24898	429
Stellenbosch	25478	702
Swartland	23168	1052
Swellendam	8181	814
Theewaterskloof	19862	1040
Witzenberg	16228	942

Western Cape Government
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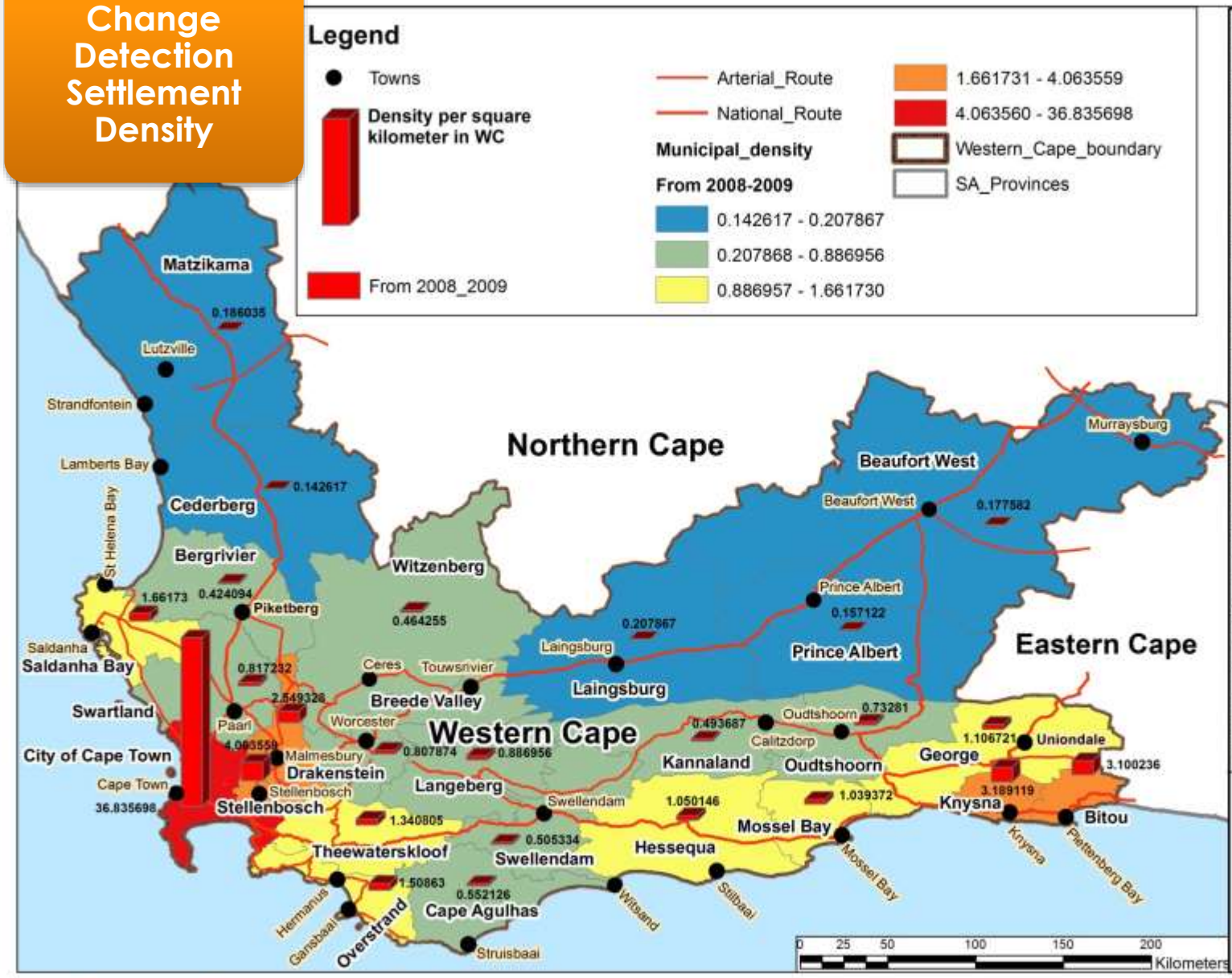
Western Cape: Density map reflecting areas of high number of buildings

Scale: 1: 2000 000

Compiled by: Nesengani RB
Date: 01/01/2016

Change Detection Settlement Density



MUNICNAME	2008	2009
Beaufort West	1343	2549
Bergrivier	753	1116
Bitou	463	2612
Breede Valley	1666	1431
Cape Agulhas	628	1286
Cederberg	581	561
City of Cape Town	70811	19060
Drakenstein	1560	2360
George	1889	3856
Hessequa	2138	3883
Kannaland	846	1503
Knysna	667	2869
Laingsburg	465	1361
Langeberg	1688	2319
Matzikama	1015	1400
Mossel Bay	885	1205
Oudtshoorn	768	1824
Overstrand	1117	1459
Prince Albert	420	861
Saldanha Bay	1274	2075
Stellenbosch	599	2778
Swartland	1197	1837
Swellendam	739	1199
Theewaterskloof	1935	2398
Witzenberg	3126	1866

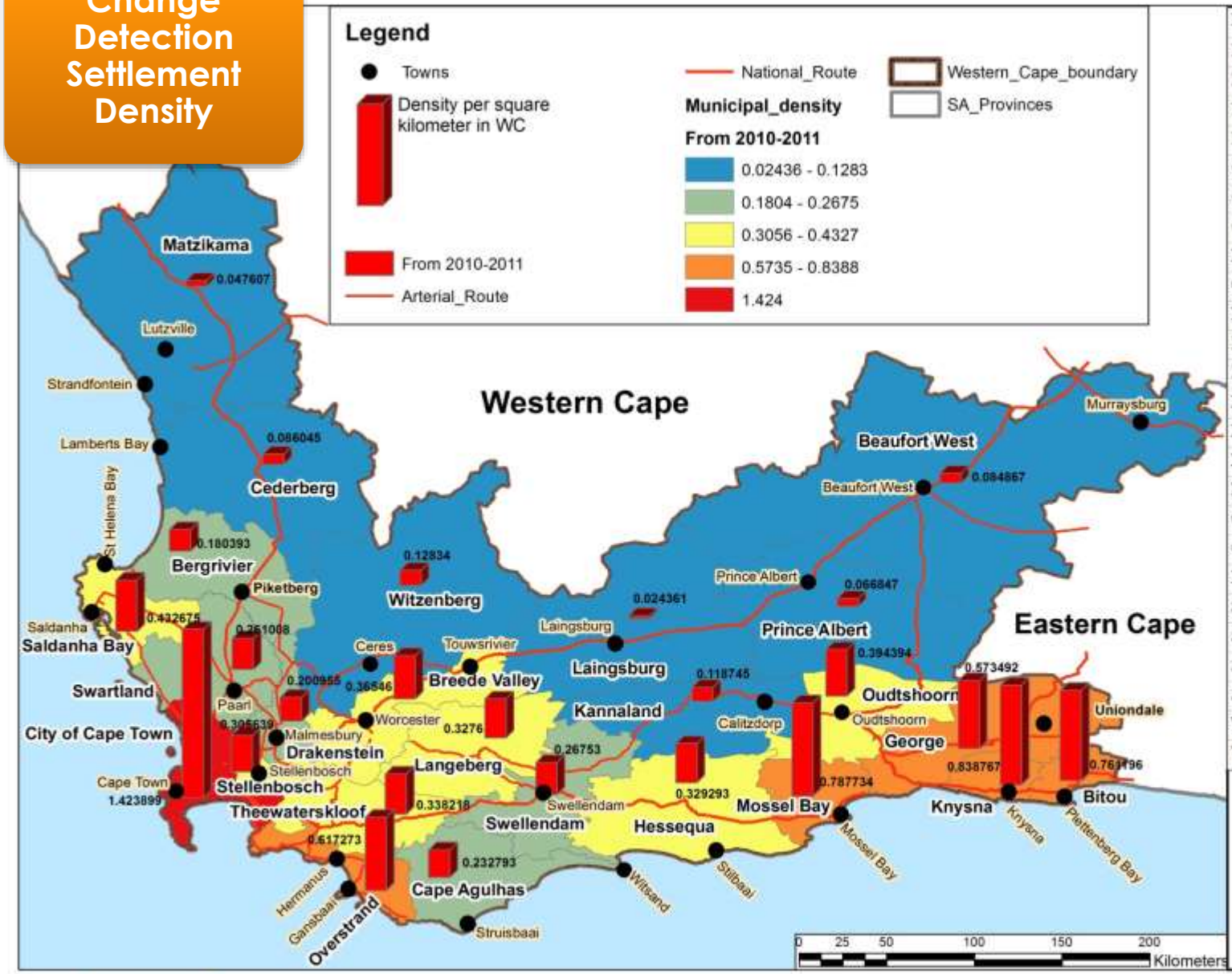
Western Cape Government
Environmental Affairs & Development Planning

Western Cape: Density map reflecting areas of high number of buildings

Scale: 1: 2000 000

Compiled by: Nesengani RB
Date: 01/01/2016

Change Detection Settlement Density



MUNICNAME	2010	2011
Beaufort West	1378	482
Bergrivier	431	364
Bitou	343	412
Breede Valley	701	700
Cape Agulhas	597	210
Cederberg	95	594
City of Cape Town	2733	741
Drakenstein	263	46
George	1452	1525
Hessequa	1490	398
Kannaland	442	123
Knysna	415	515
Laingsburg	94	120
Langeberg	865	615
Matzikama	179	439
Mossel Bay	1016	568
Oudtshoorn	1036	359
Overstrand	720	334
Prince Albert	193	352
Saldanha Bay	408	464
Stellenbosch	207	47
Swartland	322	647
Swellendam	783	243
Theewaterskloof	848	245
Witzenberg	786	594

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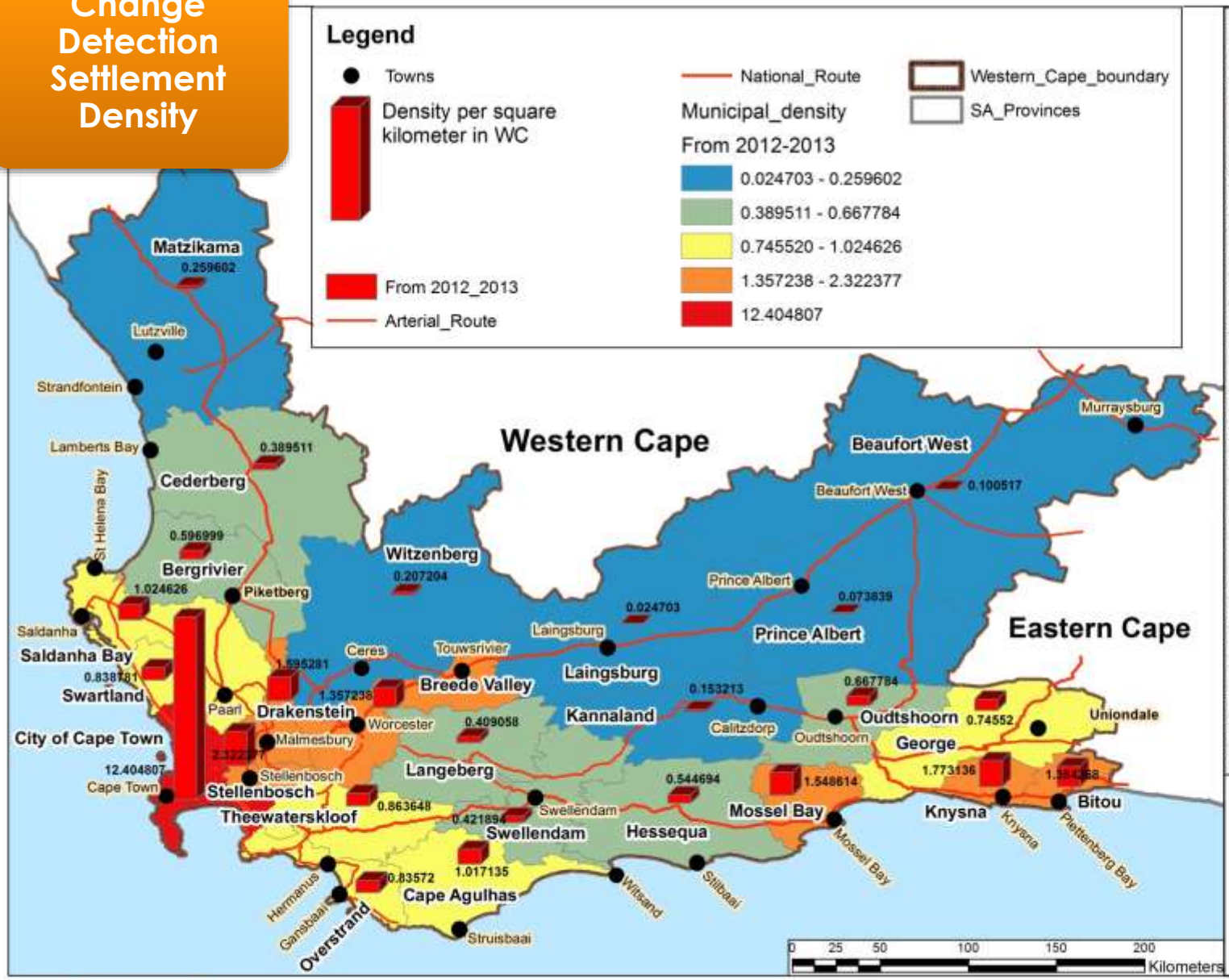
Western Cape: Density map reflecting areas of high number of buildings

Scale: 1: 2000 000

Compiled by: Nesengani RB
Date: 01/01/2016

Change Detection Settlement Density



MUNICNAME	2012	2013
Beaufort West	1247	956
Bergrivier	1338	1293
Bitou	961	412
Breede Valley	3512	1691
Cape Agulhas	2520	1006
Cederberg	1260	1859
City of Cape Town	28037	2228
Drakenstein	1712	741
George	2603	1267
Hessequa	1852	1271
Kannaland	433	296
Knysna	1688	278
Laingsburg	124	93
Langeberg	1388	460
Matzikama	1410	1960
Mossel Bay	2625	489
Oudtshoorn	1965	397
Overstrand	853	574
Prince Albert	467	135
Saldanha Bay	600	1465
Stellenbosch	1753	177
Swartland	1686	1428
Swellendam	1143	475
Theewaterskloof	1639	1152
Witzenberg	1482	746

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Western Cape: Density map reflecting areas of high number of buildings

Scale: 1: 2000 000

Compiled by: Nesengani RB
Date: 01/01/2016

BASIC SERVICES PROVISIONING

CURRENT TRUTH

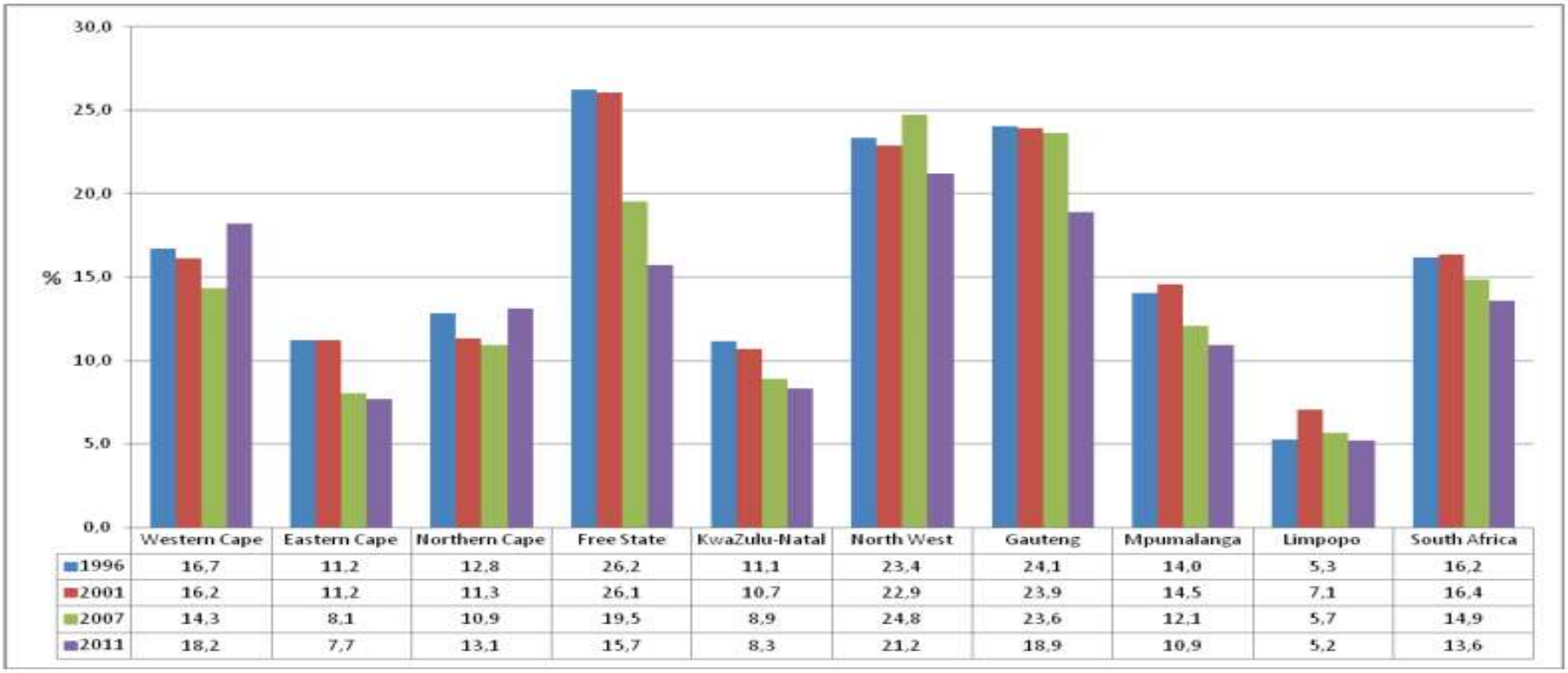
ACCESS TO BASIC SERVICES
STATE OF SERVICES
CAPACITY / FUNDING GAP

Western Cape Government

Relative changes in dwelling type per Province

Figure 3.3: Percentage of households living in informal type of dwellings by province: Census 1996, 2001, 2011 and Community Survey 2007 p26

Source: Statistics SA, Census 2011 Provinces at a Glance. Report No. 03-01-43



	Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu-Natal	North West	Gauteng	Mpumalanga	Limpopo	South Africa
1996	16,7	11,2	12,8	26,2	11,1	23,4	24,1	14,0	5,3	16,2
2001	16,2	11,2	11,3	26,1	10,7	22,9	23,9	14,5	7,1	16,4
2007	14,3	8,1	10,9	19,5	8,9	24,8	23,6	12,1	5,7	14,9
2011	18,2	7,7	13,1	15,7	8,3	21,2	18,9	10,9	5,2	13,6

The period 2007 to 2011 saw a remarkable increase in the percentage of households living in informal type of dwellings in the Western Cape – and increased from 1996 base year.

All other Provinces experienced a decline in percentage of households living in informal type dwellings (Northern Cape the exception with a 2.2% movement).

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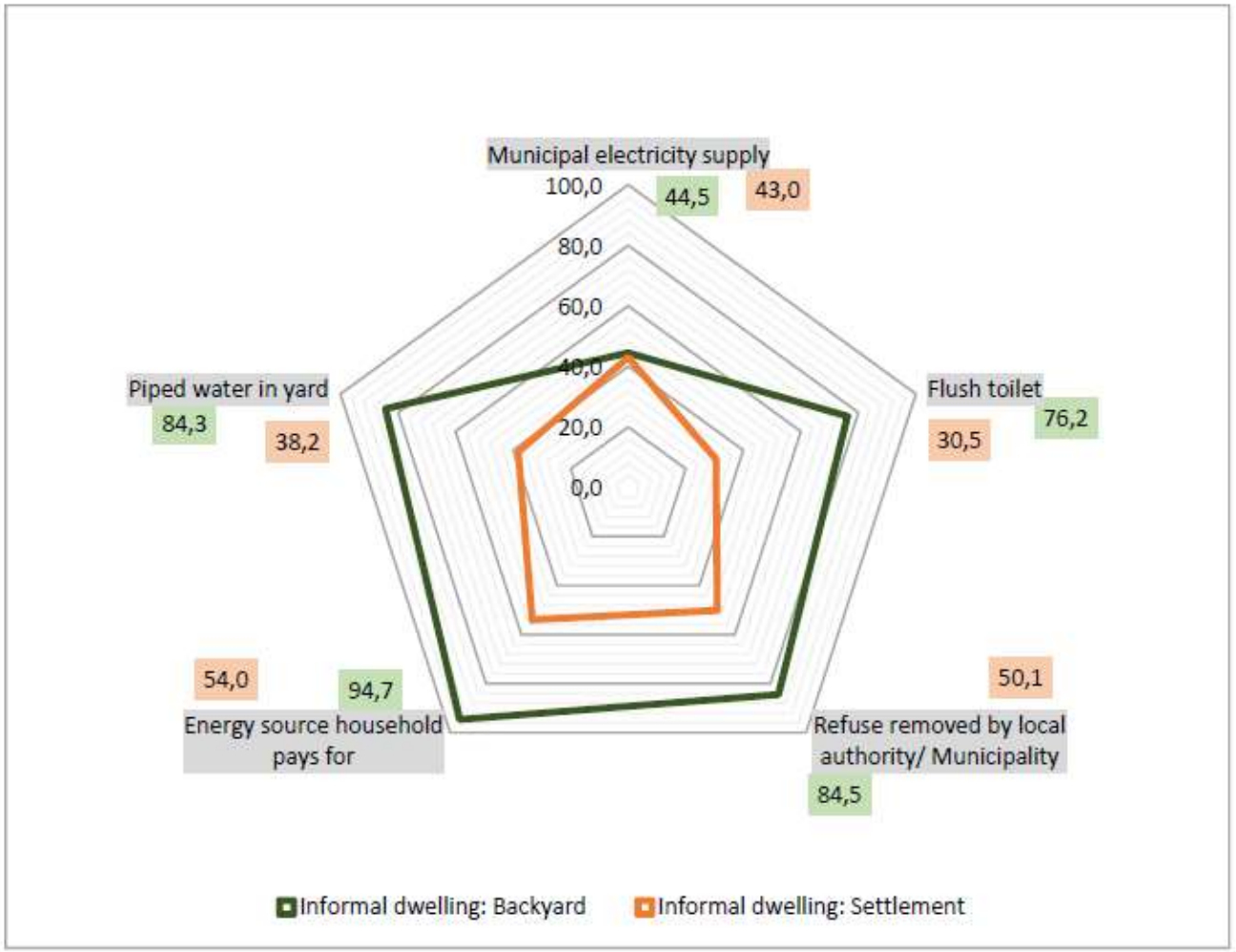
Access to Services in Informal Dwellings by service type

Percentage of Households living in informal dwellings by services they accessed, 2014



[Source: Stats SA: Report 03-18-06 (2002-2014), Released 2016

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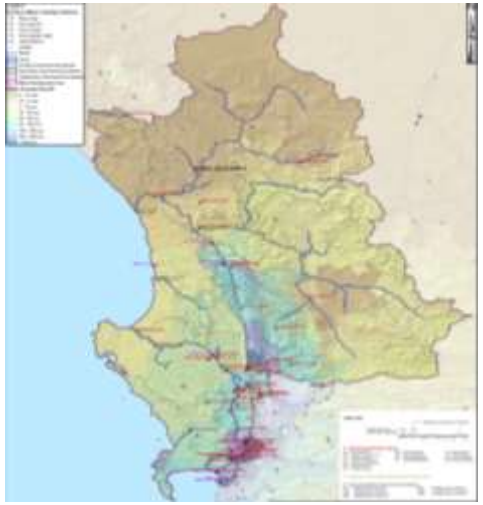
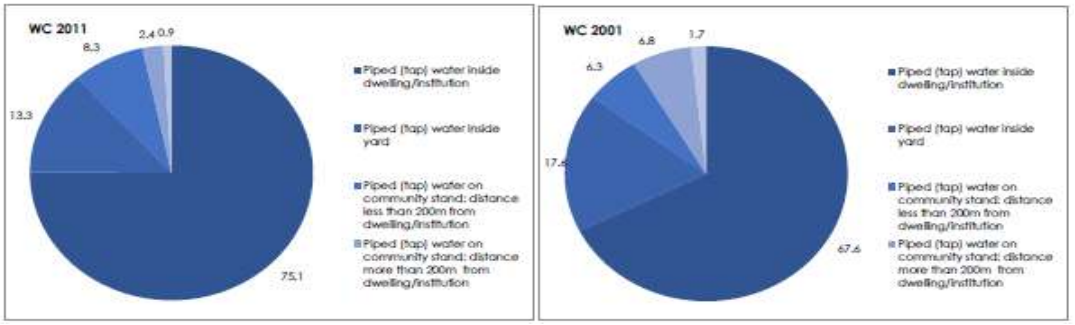
Water Resource Management

Strategic Overview





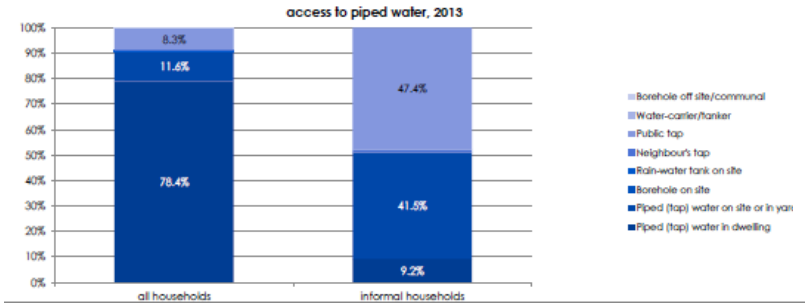
Natural Resource - 4 Catchments → ¾ Deficits – Breede System

Shortfall in 15 municipalities – including high growth municipalities

75% HH in WC have access to water inside dwelling this increased from 67% in 2001

Only 9.2% of HHs in informal settlements have access to water inside dwelling, and a further 41.5% have access to water on site or in yard, 47% have access to a public tap

WC 2nd position with Blue Drop Status, but quality is declining



blue drop CERTIFICATION
drinking water quality REGULATION

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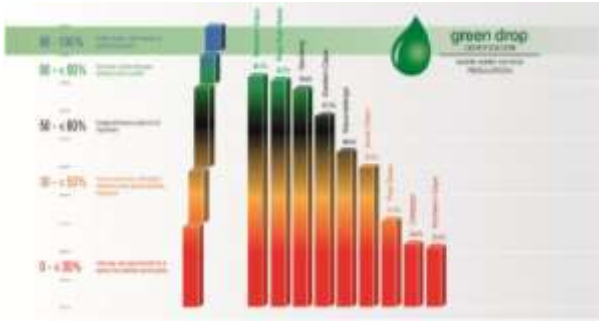
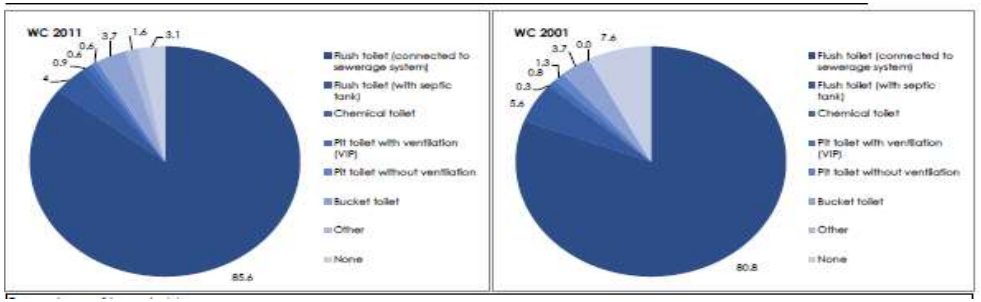
Sanitation

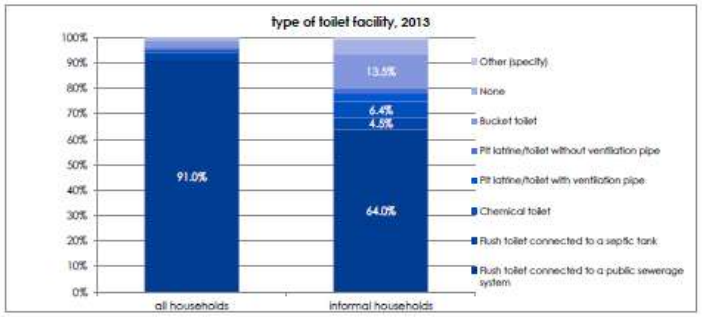
Strategic Overview





WWTWs under capacity in 9 municipalities

Including high growth municipalities



86% HH in WC have access to flush toilet connected to a sewerage system - this increased from 81% in 2001

Only 64% of HHs in informal settlements have flush toilet connected to a sewerage system

WC Green Drop Status improved

84.5% Provincial Green Drop Score
84.2% of plants (133 of 158) in low and medium risk positions.
9 number of Wastewater Systems with <30% score

Significant shortfall – conventional service delivery [1:1 provisioning] for infrastructure only @ R1.45 bn / and for approx. 174000 unserviced dwellings [Relocation and operating budget deficits significant under this scenario]

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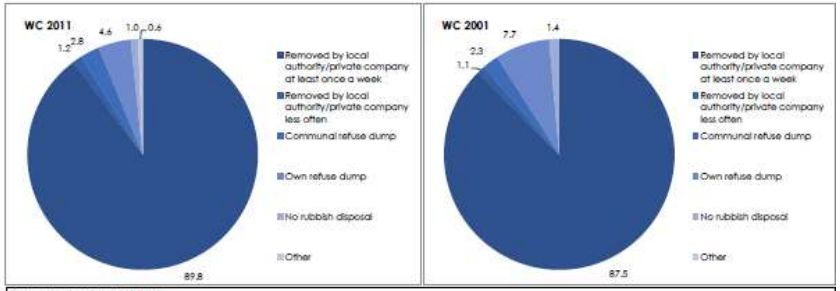
Refuse Removal / Solid Waste

Strategic Overview



Percentage of households
% of households in the Western Cape that have access to refuse removal
Census 2001 and Census 2011, Stats SA
PSG 4, PSG 5

Landfill sites under severe pressure – cost of compliance

R1 bn (excl CoCT)

Including high growth municipalities – crisis

89% HH in WC have access to refuse removal at least once a week - this increased from 87% in 2001

Waste minimisation statistics fluctuations

Tariff structure deficits

No more landfill for sewerage sludge

Percentage
Total amount of waste minimised out of total amount of waste generated
City of Cape Town database
PSO 4
The majority of the municipalities in the Western Cape are struggling with quantification and recording of waste data. Of the 156 waste disposal facilities in the province only 7 have weighbridges which make it difficult to quantify waste volumes.

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OUTCOMES

Readiness for Growth* = *Complex

Brings with it the Opportunities relating to service delivery

- **Innovation Capital** = Need infrastructure plans, institutional, financial and human capacity – How Urbanisation Happens Matters! **We cannot continue to allocate the same space, volume of water, KWh of dirty electricity and volume of landfill air space per person/HH as we have in the past.**

- **Differentiated Approach** = Infrastructure demands not just quantitative, also qualities, use-value and affordability of infrastructure, and for whom

- Improvement in the world must be highly **contextualised & Fit for purpose** = Demands change over time: changing economic, social and technical demands and requirements.
- **Whole of Society** = Entire societal response to urbanisation required

- Unlikely that **allocations** to the Province will increase (immediate & short term)

- **Liberate & coordinate data & link** data to design at detailed level

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Urbanisation = Key for Basic service delivery challenges to be turned into significant opportunities!

1st next 5 years :➔ Readiness for new IDP Cycle

- Partnership – Joint solutions
- Transversal Management & Joint Planning at different levels / Integrated Management Systems
- Joint Prioritisation & Joint action plan

"Smart, enabling & responsive 4th Generation IDPs ➔ takes the Province forward during the next five years"

Perceptions Driving Policy Decisions

Different Thinking – Applied Innovation

Socio-economic Transformation

Social – Ecological- Transformation

WE CAN DO IT 'THE BEST' - TOGETHER!

Mahalia Jackson, who shouted behind him, "Tell them about the dream!"[I]

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Thank You

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