

ENSURING FREE AND FAIR ELECTIONS

ELECTORAL COMMISSION

Elections and Technology

Emerging trends and innovations

Melanie du Plessis
Electoral Commission of South Africa
November 2017



SOUTH AFRICA

Functions of the Electoral Commission

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- Manage elections of national, provincial and municipal legislative bodies
- Ensure that those elections are free and fair
- Declare those results within a period prescribed by national legislation
- Applicable legislation includes, *inter alia*:
 - The Constitution, Act 108 of 1996
 - The Electoral Act, 107 of 1998
 - The Electoral Commission Act, 51 of 1996
 - The Municipal Electoral Act, 27 of 2000



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Electoral Processes

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- High level electoral processes:
 - Delimitation and Registration
 - Party Registration and Candidate Nomination
 - Electoral Staff management
 - Ballot papers and Logistics
 - Voting
 - Counting and Results
 - Dissemination of information
- Political parties are involved in electoral processes through Party Liaison Committees at all levels.
- ICT underpins all of the electoral processes.



Delimitation and Registration

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- The Constitution, Act 108 of 1996, stipulates that all elections must be based on a *national common voters' roll* (i.e. a person's name may appear only once on the voters' roll).
- Electoral Act, 107 of 1998, provides for a SA Citizen over the age of 16 to apply for registration, where they are ordinarily resident (will only be included on voters' roll at age 18).
- In order to achieve this, the Act provides for the creation of voting districts, each with one voting station, in accordance with specified guidelines.



Delimitation and Registration (GIS)

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- Using the guidelines and business rules, the delimitation process is as follows:
 - Using the GIS, voting district boundaries determined and working maps produced for each ward (A0/A1) with background information, current voting station etc.
 - Maps are sent to municipal offices for confirmation and sign-off by party liaison committees and then returned to national office;
 - At national office requested amendments are evaluated and, once approved, implemented on the spatial database (GIS);
 - GPS locations for identified voting stations are recorded on the *Voting Station Operation system*;
 - Bar-coded voting district maps are produced in A3 for use during the registration process.



Final Wards And Split VDS, LGE 2011 - City of Johannesburg Metropolitan Municipality (JHB) : Ward 47



MAP LEGEND



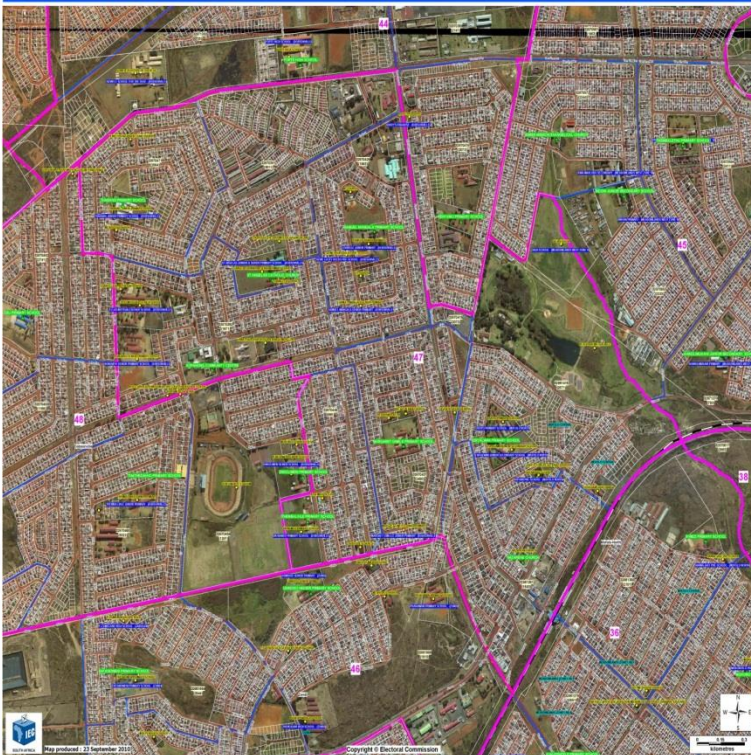
Geographic data supplied by authors or
China's Geographical Information Institute

VITAL STATISTICS

Issuing agency	2013-2014 (in \$ mil.)								Grand Total	Electricity Sales % National
	Jan. 1 to Dec. 31				Jan. 1 to Jan. 31					
	% Increase	% Decrease	Sub-Total	Total	% Increase	% Decrease	Sub-Total	Total		
Alabama	100	0	100	100	100	0	100	100	100	100
Alaska	100	0	100	100	100	0	100	100	100	100
Arizona	100	0	100	100	100	0	100	100	100	100
Arkansas	100	0	100	100	100	0	100	100	100	100
California	100	0	100	100	100	0	100	100	100	100
Colorado	100	0	100	100	100	0	100	100	100	100
Connecticut	100	0	100	100	100	0	100	100	100	100
Delaware	100	0	100	100	100	0	100	100	100	100
District of Columbia	100	0	100	100	100	0	100	100	100	100
Florida	100	0	100	100	100	0	100	100	100	100
Georgia	100	0	100	100	100	0	100	100	100	100
Hawaii	100	0	100	100	100	0	100	100	100	100
Idaho	100	0	100	100	100	0	100	100	100	100
Illinois	100	0	100	100	100	0	100	100	100	100
Indiana	100	0	100	100	100	0	100	100	100	100
Iowa	100	0	100	100	100	0	100	100	100	100
Kansas	100	0	100	100	100	0	100	100	100	100
Kentucky	100	0	100	100	100	0	100	100	100	100
Louisiana	100	0	100	100	100	0	100	100	100	100
Maine	100	0	100	100	100	0	100	100	100	100
Maryland	100	0	100	100	100	0	100	100	100	100
Massachusetts	100	0	100	100	100	0	100	100	100	100
Michigan	100	0	100	100	100	0	100	100	100	100
Minnesota	100	0	100	100	100	0	100	100	100	100
Mississippi	100	0	100	100	100	0	100	100	100	100
Missouri	100	0	100	100	100	0	100	100	100	100
Montana	100	0	100	100	100	0	100	100	100	100
Nebraska	100	0	100	100	100	0	100	100	100	100
Nevada	100	0	100	100	100	0	100	100	100	100
New Hampshire	100	0	100	100	100	0	100	100	100	100
New Jersey	100	0	100	100	100	0	100	100	100	100
New Mexico	100	0	100	100	100	0	100	100	100	100
New York	100	0	100	100	100	0	100	100	100	100
North Carolina	100	0	100	100	100	0	100	100	100	100
North Dakota	100	0	100	100	100	0	100	100	100	100
Ohio	100	0	100	100	100	0	100	100	100	100
Oklahoma	100	0	100	100	100	0	100	100	100	100
Oregon	100	0	100	100	100	0	100	100	100	100
Pennsylvania	100	0	100	100	100	0	100	100		

CERTIFICATION / APPROVAL

PEO	_____	Date	_____
MEO	_____	Date	_____
PLC Chairperson	_____	Date	_____
PLC members	_____		
Name	Party	Signature	Date



Map produced : 23 September 2010

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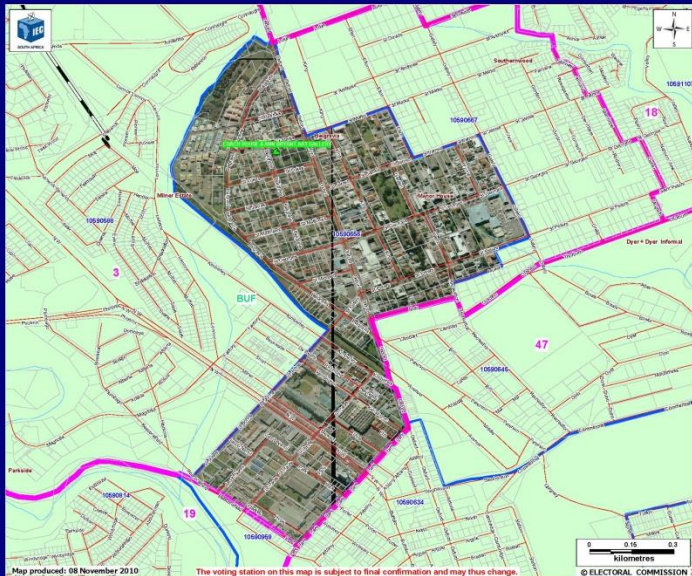


Barcoded voting district map



VOTER REGISTRATION WEEKEND 1: ON 5 & 6 FEBRUARY 2011
COACH HOUSE & ANN BRYANT ART GALLERY

VD 10590656
Ward 3



REGISTRATION AND VOTING STATION

No: 10590656

VOTING STATION NAME:
COACH HOUSE & ANN BRYANT ART GALLERY

VOTING STATION LOCATION:
 EAST LONDON
 SOUTH AFRICA
 ST. 190015

Location of Voting District in the Municipality



MAP LEGEND

- Municipal Boundary
- Ward Boundary
- Voting District Boundary
- Road
- Railway Line
- River
- Mountains Ridge
- Place Name
- 10590656 Voting District Number
- Registration and Voting Station Name
- Mobile Voting Station Name



Eastern Cape
BUF

Buffalo City
Buffalo City [East London]

VOTING DISTRICT No. 10590656

Delimitation and Registration

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- Specialised barcode scanners (called “Zip-Zips”) are used to register voters.
- In 1998, when the first voters’ roll had to be created, the use of these devices enabled the Commission to register 18.1 million voters accurately in the 6 days of the first general registration drive.
- The devices also ensure that prospective voters, irrespective of place of residence (urban/rural), level of education or socio economic status, receive the same level of service from the Commission with respect to registration.



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Delimitation and Registration

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- Registration Process:
 - Using the Zip-Zip, the barcode on voting district map is scanned first to create a spatial reference for registrations in the voting district.
 - The barcode in the identity document (ID) of an applicant is then scanned. The ID number is a 13-digit number, containing info regarding birth date, gender, citizenship and a check digit to verify that the number is authentic.
 - Two receipts are printed on labels; one affixed to the ID of the applicant and the second on the form (REC1) which they completed with the personal and address details.
 - The Zip-Zips are then docked at the municipal office and the files containing the scanned ID numbers transferred to national office via the wide area network (WAN).
 - Files are processed using the *Voter Registration System*.



Delimitation and Registration

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- Registration process (continued)
 - Using the ID number, the name and surname and status of the person is then extracted from the National Population Register (NPR).
 - Persons can check whether their registration has been successful via SMS or the Commission's web-site ("Am I registered?") or via the mobile application.
 - In the case of two registration weekends, an inspection voters' roll is produced after the first weekend, so that persons can verify their inclusion on the roll during the second weekend.
 - An application will be unsuccessful if, for example, the person is not a South African citizen, or the ID number not found on the population register.
 - A voters' roll can be produced within a week of a registration weekend.



Delimitation and Registration

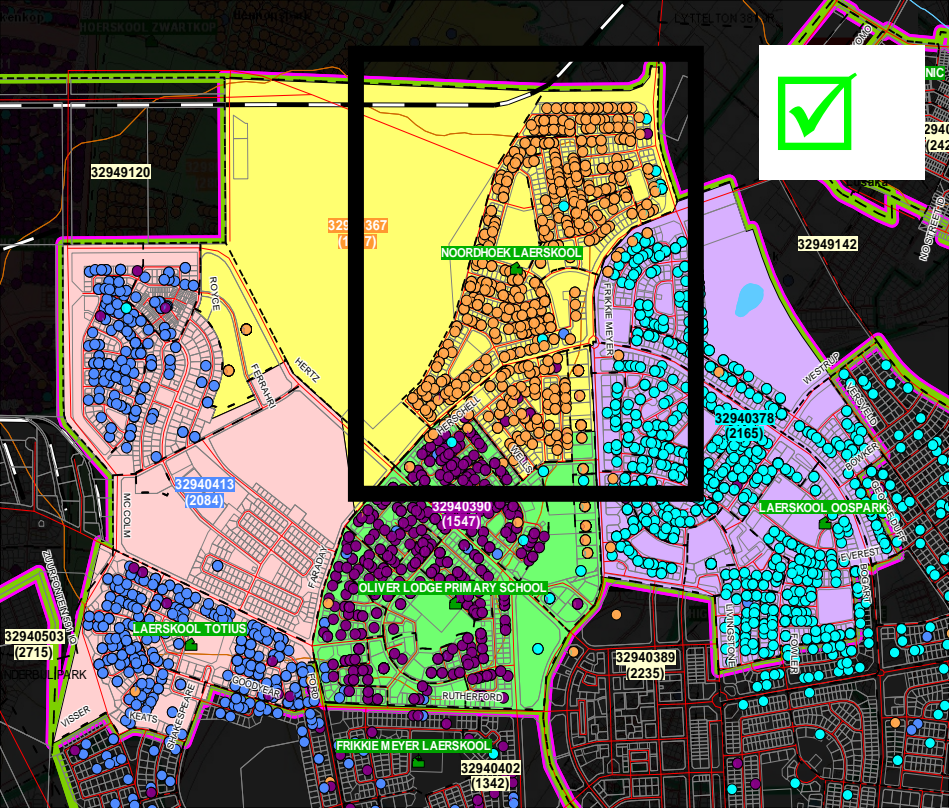
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- Post December 2015:
 - A Constitutional court order focused attention on addresses of voters which led to:
 - Changed registration processes - including GIS analysis to determine whether voters are correctly registered for by-elections
 - Addresses printed on the physical voters' rolls
 - Number of projects have been and will be undertaken to obtain addresses for all registered voters, including:
 - Capturing addresses on election day (3 August Municipal elections and all by-elections since)
 - Online address capture facility on the website
 - Address weekend planned for 10/11 March 2018



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Online address capture

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- Create secure profile
- Add or edit address using search, typing or a map
- Confirm address – at this point a link is established to the correct voting district
- If voting district of registration is different from address voting district – advise voter of a move and if accepted, apply the move

My EEC

My Address

To ensure that you, as the voter, are registered in the correct ward and voting district, you are required by law to provide the address (or sufficient particulars) of where you ordinarily reside. This is the home or place where you normally live.

Use one of the 3 options below to submit your address - select, insert or use map

Option 1: Select your address from the search list

Enter your address to search

Example: 7049 berkheys cres, centurion, south africa

OR

Option 2: Insert/update your address

Please insert/update the details of the address where you ordinarily reside below

Flat number (if applicable):	<input type="text" value="102"/>	e.g. Unit 10
Complex name (if applicable):	<input type="text" value="CRESCENT GARDENS PIETERMARITZBURG C"/>	e.g. Legerfontein
Number:	<input type="text" value=""/>	e.g. 1540
Street name:	<input type="text" value="113 LOOP STREET"/>	e.g. Berkheys Crescent
Suburb:	<input type="text" value="PIETERMARITZBURG CENTRAL"/>	e.g. Amersfoort Island
Tribal authority:	<input type="text" value=""/>	e.g. Ixopo/Umhlanga Village
Town:	<input type="text" value="PIETERMARITZBURG"/>	e.g. Pretoria

OR

Option 3: Use map to locate your address

Use map to locate your address if you could not find your address using the options above

Submit your address

“Zip-Zip”

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New registration device

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- An evaluation process is currently underway to procure new registration devices
- The new devices will (hopefully 😊) enable:
 - Recording the registration (similar to current device) with a printed receipt
 - Capture the applicant's address and relate to the correct voting district
 - Immediate transmission of data (where connectivity available) or docking at the various offices
- What it will look like



New registration device

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- Applications currently available on the Zip-Zips are:
 - Voter registration – the ID number is recorded against a particular voting district
 - Voter participation – the ID number is recorded at the voting station and some information inferred from that, i.e. time of voting, gender, age and place of voting
 - Staff attendance – ID number of staff member is recorded and linked to the ESS system to facilitate speed and accuracy
- The mobile framework intended for the device will enable other applications such as ballot paper tracking and tracking issues logged by political parties
- All the applications for the new device will be done in-house



ICT Electoral Systems

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- Systems developed in-house include, *inter alia*:
 - Voting Station Operations – voting stations
 - Voter Registration System
 - Party Registration System
 - Candidate Nomination System as well as an *online version for parties* to capture their own candidates
 - Electoral Staff System
 - Ballot Paper Generation System
 - Outreach Management System
 - PLC Documentation Tracking System
 - NPE Results System
 - LGE Results System
 - eProcurement System



Online CNS

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- Facility to capture candidate details for each available seat and upload required documentation



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Online Candidate Nomination

[Home](#) [Generate Ref No & Pay](#) [Manage Candidates](#) [Reports](#) [System Administration](#) [Help](#) [Sign out](#)

Home

Party Name: SIMONDS PARTY
Logged on as: JOHANNES GERHARDUS COETZEE
Level Assigned: National



Note: You will only be limited to capture candidates for specified level (ids included in the Payment Reference Number).
If you cannot capture candidates for a particular level (id, please contact your Online Party Administrator (OPA) to generate payment reference number for those level (ids you would like to capture candidates for).

21 Dec 2017 By Election
(Currently Open For Capture)

Current Electoral Event Statistics

List Item	Not Submitted As Final		Submitted As Final	
	PR & DC4%	Ward	PR & DC4%	Ward
Candidates Submission Status	1	1	0	0
Candidates Voted	0	0	0	0
Candidates Withdrawn	0	0	0	0
Open For Non Compliance	0	0	0	0
Candidates Captured	1	1	0	0
Candidates Exceptions	0	0	0	0
Candidates with Outstanding Documentation	1	1	0	0
Disqualified Candidates	0	0	0	0

Online CNS Notification

List Item	Files Uploaded	Files Processed (Valid)	Files Processed (Invalid)
Municipal Ball Enrol List	0	0	0
Party Candidate Doc Files	2	0	0

Election Timetable: The Time table will only be available after proclamation

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Online CNS

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- Facility for online payment through a secure gateway. The correct amount and reference number for the selected areas are provided by the system.



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Online Candidate Nomination

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Generate Payment Reference

Electoral Event:
Province:
Municipality:

Party Name:
Login (on as):
Level Assigned:



Payment Ref #:
Total Amount:
Landed List:

[Generate Payment Ref No.](#) [Upload Proof of Payment](#)

Generate Payment Ref No

Landed List	Payment Reference
<input checked="" type="checkbox"/> JHB - City of Johannesburg	CND091 Not Paid
<input type="checkbox"/> 79000001	
<input type="checkbox"/> 79000002	
<input type="checkbox"/> 79000003	
<input type="checkbox"/> 79000004	
<input type="checkbox"/> 79000005	
<input type="checkbox"/> 79000006	
<input type="checkbox"/> 79000007	
<input type="checkbox"/> 79000008	
<input type="checkbox"/> 79000009	
<input type="checkbox"/> 79000010	
<input type="checkbox"/> 79000011	
<input type="checkbox"/> 79000012	
<input type="checkbox"/> 79000013	
<input type="checkbox"/> ...	

[Update Selections](#)

Payment Reference Details
Payment Reference #: CND091
Amount to be Paid: R 100.00
Total Amount Received: R 0.00
Date Payment Ref. Generated: 23/11/14 02:14:53 PM
Payment Update
Note: To make EFT Cash and Cheque deposit, print deposit reference number or pay into using the Payment Gateway
Print Payment Ref. Print Deposit Reference
Make payment using (Declared Payment Gateways)
<input type="button" value="Go Home"/>
Payment Reference Edit Details
Previous Amount: <input type="text" value="R 100.00"/> Date Last Edited: <input type="text" value="No History"/> Edited By: <input type="text" value=""/>

Results

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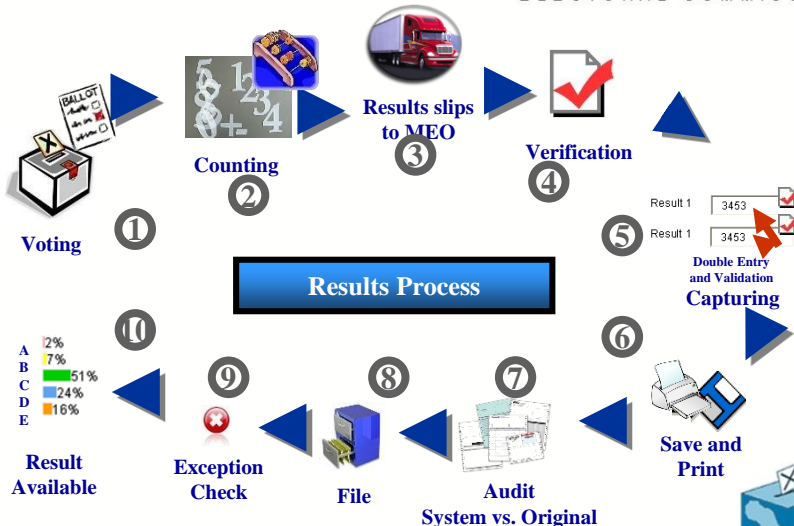
- Special votes application support – Special Votes Application module is available to capture and verify applications for special voting.
- Results Systems support the capturing and auditing of results, exceptions management, edit windows, seat calculation and assignment. A link to the CNS is available for candidate information. NPE and LGE use different seat calculation methods.
- Result slip scanning was introduced during the 2009 elections where each slip is scanned and linked to the corresponding captured result, improving transparency of the results process.
- Results Operations Centres (ROC) – IT operations provides infrastructure and network connectivity at 1 national and 9 provincial results operation centres. System support for display boards and GIS map and graphic displays are also provided.
- Issue Tracker and Voting Station Monitoring systems
- An Atlas of Results is done by GIS after National & Provincial elections.



Voting, Counting and Results Process

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[illegible]

Results Operations Centre

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Dissemination of information

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- **Communications and Knowledge Management & Dissemination**

- Web-site (Am I registered? / Where do I register? / Results / Registration information etc.)
- Mobile application & SMS – providing up to date information
- API used for internal systems and externally by media and political parties and other stakeholders
- IEC Intranet Portal (link to IEC systems, GIS on desktop and internal news)
- Business Intelligence Portal (i.e. repository of historical data from all systems).
- IEC Call centre – Voting station finder developed by GIS is used to assist voters and a voice genie to deal with call volumes
- Spatial Management Reporting maps – these maps graphically represent business process information. Progress of electoral staff appointments, cell phone coverage in voting districts, registration activity and leading party maps are examples of this concept. Another example is the Atlas of Results.



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Analysing standard BI data

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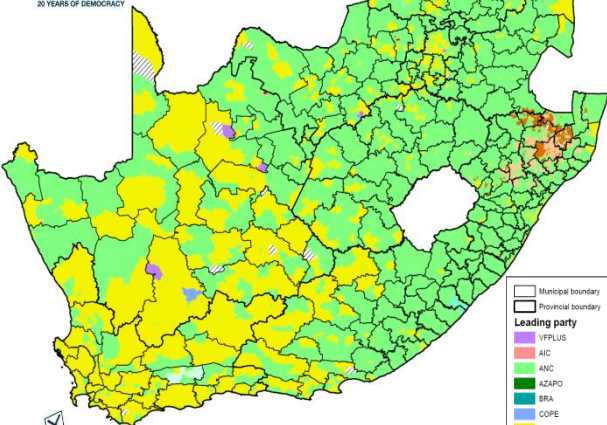
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PROVINCE	MUNICIPALITY	VOTING DISTRICT	LEADING PARTY
Eastern Cape	NMA - Nelson Mandela Bay [Port Elizabeth]	10251638	ANC
Eastern Cape	NMA - Nelson Mandela Bay [Port Elizabeth]	10251728	ANC
Eastern Cape	NMA - Nelson Mandela Bay [Port Elizabeth]	10360011	DA
Eastern Cape	NMA - Nelson Mandela Bay [Port Elizabeth]	10460045	DA
Eastern Cape	NMA - Nelson Mandela Bay [Port Elizabeth]	10460102	ANC
Eastern Cape	NMA - Nelson Mandela Bay [Port Elizabeth]	10460124	ANC
.....			
.....			
.....			
.....			
Western Cape	CPT - City of Cape Town	97110042	DA
Western Cape	CPT - City of Cape Town	97110053	ID
Western Cape	CPT - City of Cape Town	97110064	ID
Western Cape	CPT - City of Cape Town	97110525	ANC
Number of voting districts		19 726	

ATLAS OF RESULTS

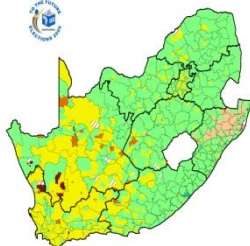
Leading party by voting district

2014 ELECTIONS

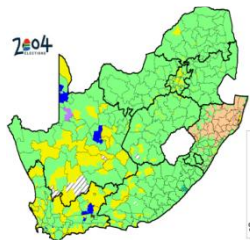


Municipal boundary
Provincial boundary

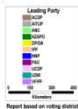
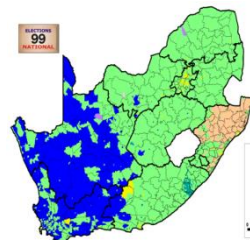
Leading party



2004 ELECTIONS



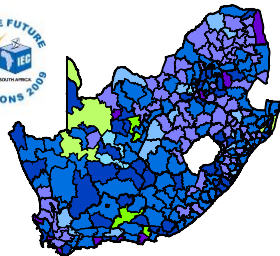
2009 NATIONAL



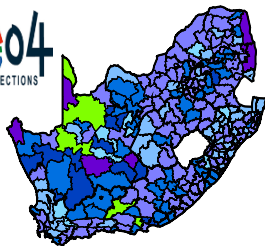
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Voters' roll analysis and comparison

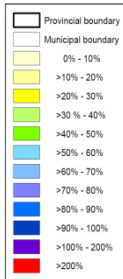
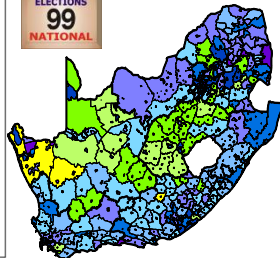
2014 ELECTIONS



2004 ELECTIONS

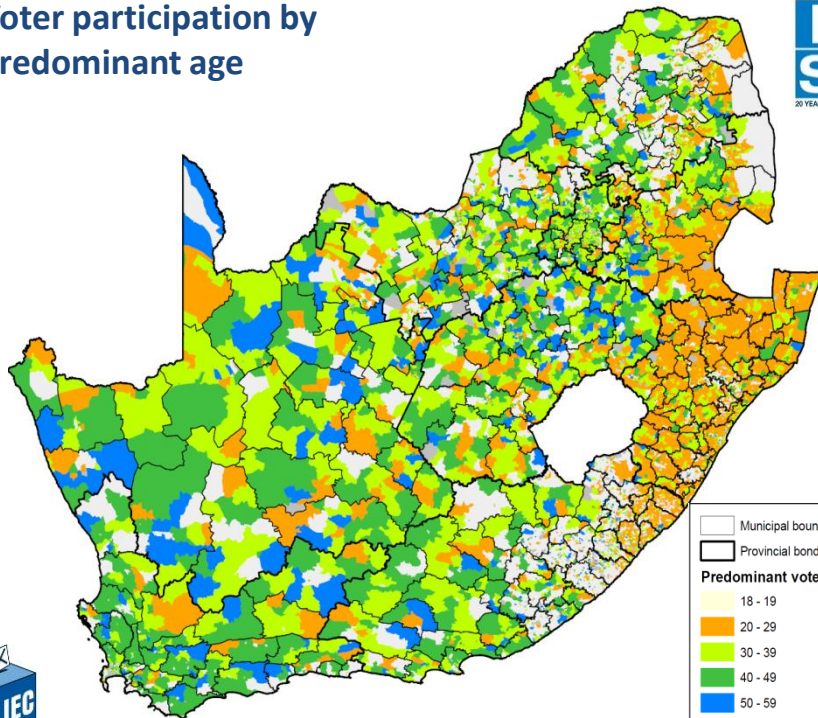


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Voter participation by predominant age



- Municipal boundary
- Provincial boundary

Predominant voters by age

- 18 - 19
- 20 - 29
- 30 - 39
- 40 - 49
- 50 - 59
- 60 +
- Data not available



Information Communication Technology

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- ICT Operations
 - Infrastructure
 - Telecommunication and networks
 - Security
 - Databases
 - Operations (monitoring, backups etc.)
- ICT Business Systems
 - Geographic Information Systems (GIS)
 - Electoral systems (i.e. voter registration, voting station operations, logistics, electoral staff, candidate nomination, party registration, ballot paper generation, voting station monitoring, special votes application, results, web-site (internet) and portal (intranet))
 - Financial systems (i.e. SAP, eProcurement)



Security

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- Security has always been a high priority and several methods are employed to secure systems and data transmission
- Key to security is not only implementation of systems, but also monitoring and the ability to react to any attempted breaches
- External security firms are regularly appointed to test the overall security posture
- Security awareness is increasingly important and a formal staff awareness programme will be implemented.



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Considerations

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- What has contributed to the success of our ICT implementation:
 - Solid business processes
 - Flexibility to adapt to changing business needs and legislation
 - Continuous maintenance of systems
 - Policy framework and governance
 - Up-to-date platforms (O/S, browsers, DBMS)
 - Disaster recovery, backups, up-to-date security
 - In-house control over electoral systems allows flexibility and autonomy
- Future trends
 - Electronic voting
 - Verifiable online voting



Finally...

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... thank you!



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