

TRIGNET WHERE WE COME FROM AND WHERE WE ARE

Evolution of South Africa's Network of Active
GNSS Reference Stations

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THE PURPOSE HAS REMAINED CONSISTENT

TrigNet extends the National Control Survey System through continuously operating GNSS reference stations.

MANDATE

Establish and maintain a national control survey network under the Land Survey Act 8 of 1997

PURPOSE

Provide reference station data for real-time positioning and post-processing.

REFERENCE FRAME

Support consistent positioning connected locally, nationally and internationally.

The technology changed. The national responsibility continued.



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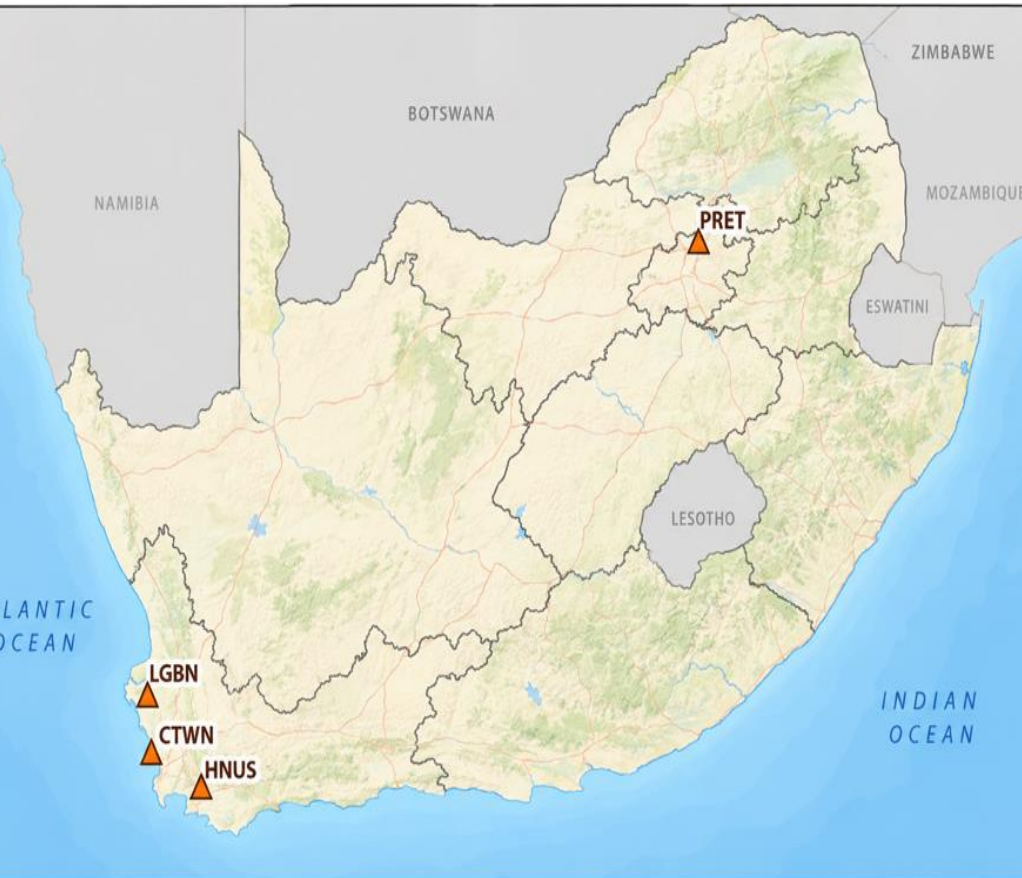
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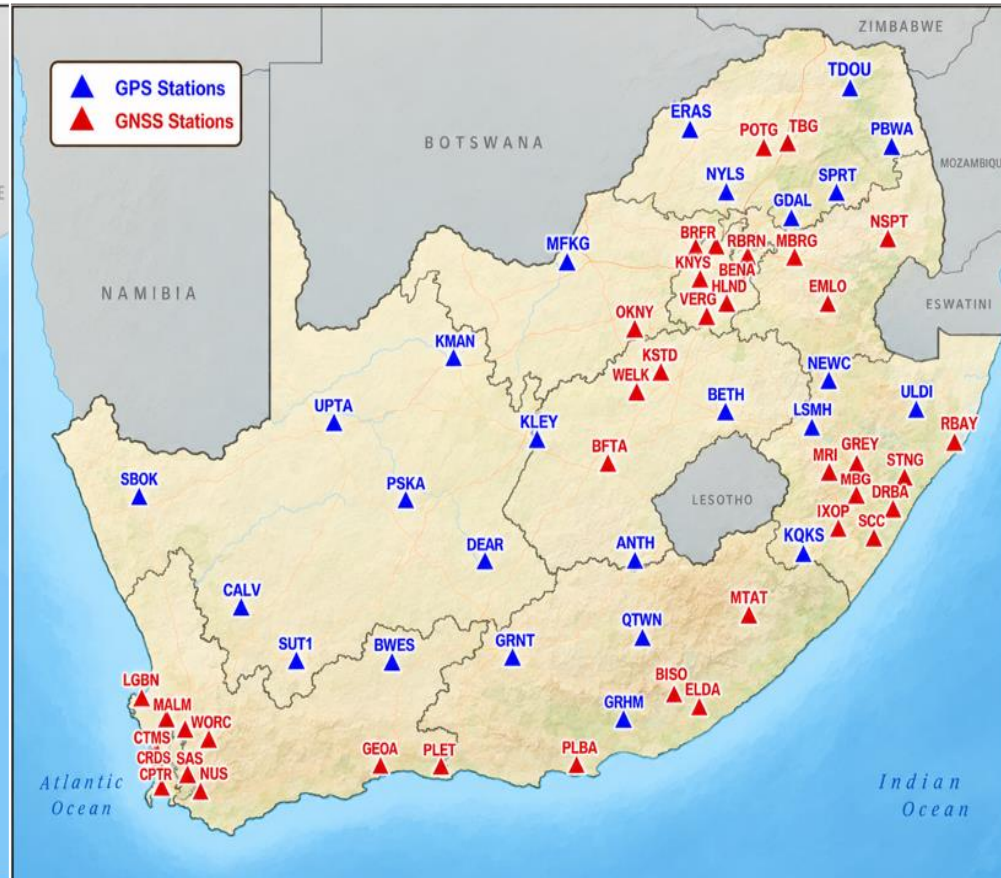
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2000: THE STARTING NETWORK



2015: TRIGNET AS A NATIONAL NETWORK



The early network created permanent access to geodetic control without occupying a passive beacon at every survey.



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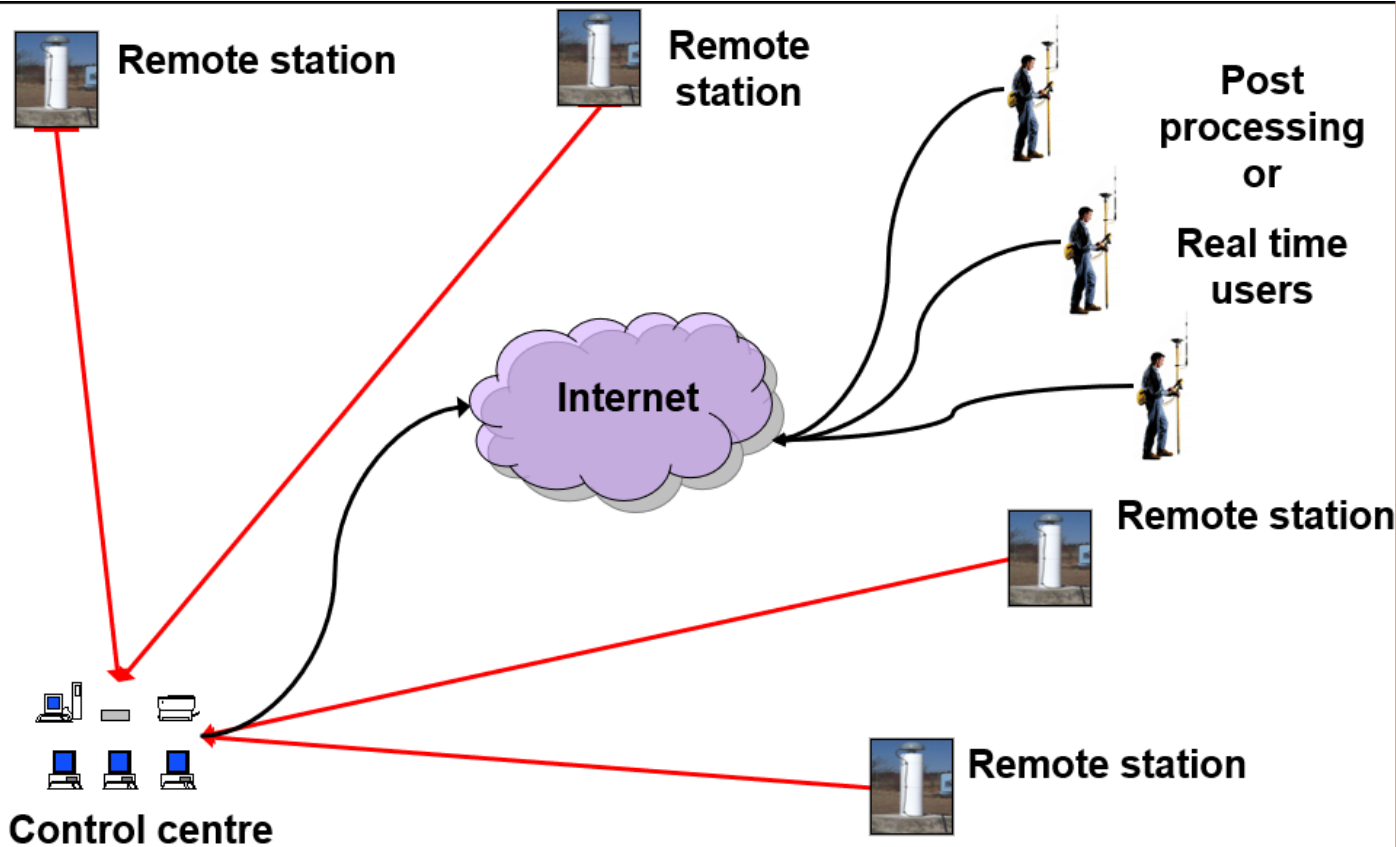
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THE EARLY NETWORK DESIGN



- One control centre at Mowbray managed remote reference stations.
- Parallel servers and selected dual-receiver sites provided redundancy.
- Stations communicated through fixed lines, VSAT and radio links.
- Users received post-processing files and real-time corrections.

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TRIGNET –GEODETIC ANTENNAS

- Choke ring antennas with radomes
- Ground Mounted
- Wall mounted
- Parapet mounted



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SINGLE CONSTELLATION ERA

TrigNet's earlier service centered on GPS.

EARLIER SERVICE

- GPS as the primary constellation
- RINEX 2.11 for GPS post-processing
- RTCM 2.3 for countrywide DGPS
- RTCM 3.1 for RTK and VRS

CURRENT DIRECTION

- Multi-constellation tracking
- RINEX 3.04
- RTCM 3.1 / 3.4



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KEY MILESTONES IN THE TRIGNET EVOLUTION

2000

2015

2023–24

2025

2026

Initial active
GNSS network

National real-
time and post-
processing
Network

Wireless and
fibre
communications
upgraded

Trimble Pivot
Platform
upgraded on
VMWare

70 stations and
multi-
constellation
expansion

Each phase increased network reach, resilience and compatibility with modern GNSS equipment.

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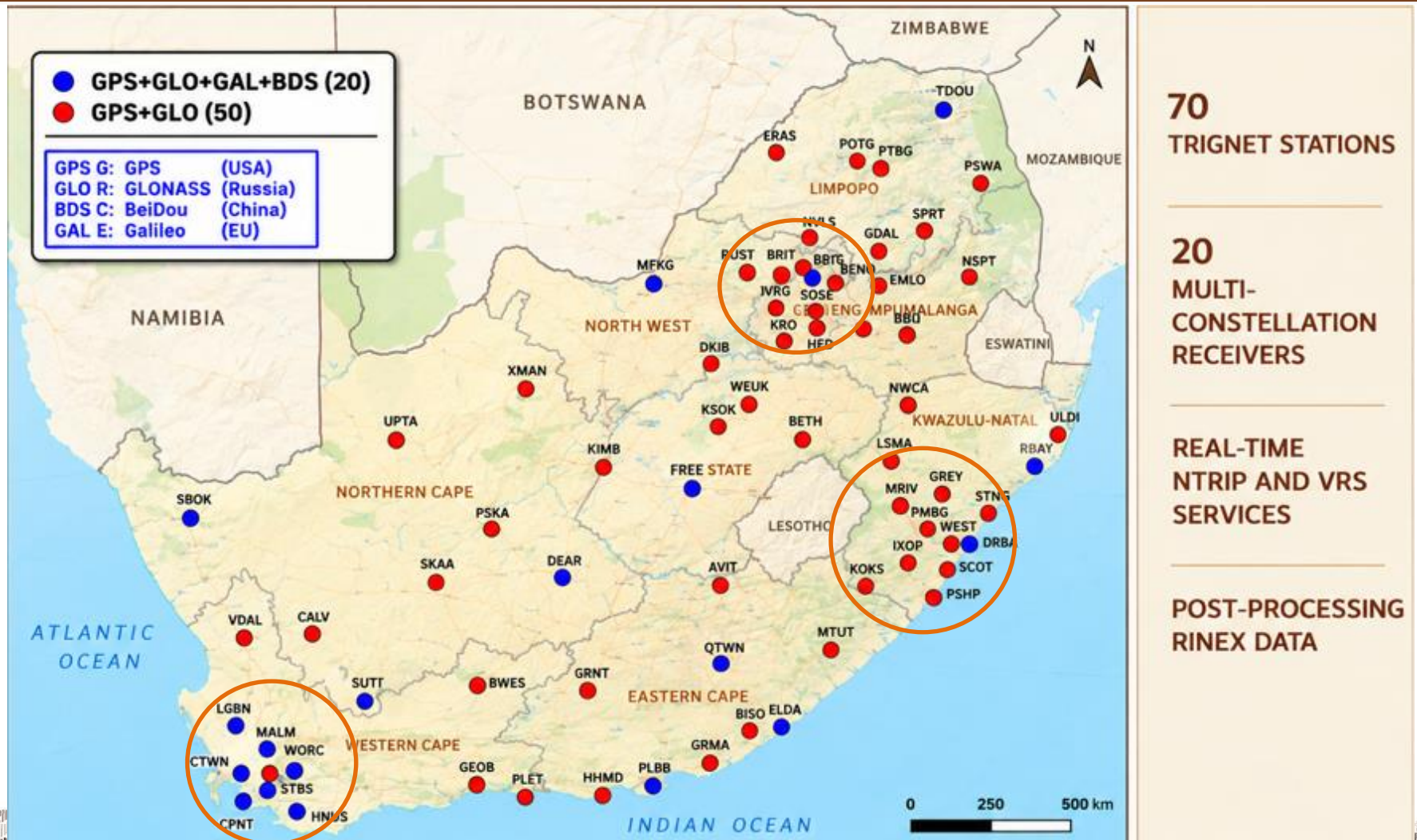
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2026 TRIGNET CONTINUOUS OPERATING GNSS NETWORK



TRIGNET DATA FLOW

1 DATA COLLECTION

CORS receivers collect continuous GNSS observations.

2 CENTRAL PROCESSING

CORS stations transmit GNSS observations to the TrigNet central infrastructure **via LTE**.

via LTE

via LTE

via LTE

via LTE

TrigNet systems receive, process, store and check station data.

3 DATA DISSEMINATION

Users access real-time corrections through NTRIP and VRS services, and observation files for post-processing.

Real-time positioning (NTRIP / VRS)

NTRIP

Real-time correction data over the internet (NTRIP).

Post-processing (RINEX data)

RINEX

Download observation files for post-processing.

The communication links from CORS stations to the TrigNet central infrastructure via LTE.

Power, LTE connectivity and data quality affect service continuity.



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TRIGNET POST-PROCESSING PRODUCTS

RINEX 3.04 supports multi-constellation GNSS post-processing.

Receiver Independent Exchange (RINEX) format • GPS, GLONASS, Galileo and BeiDou • Access via the TrigNet FTP service

1 HOURLY FILES

Available less than 40 minutes after the hour.

Observation intervals:

- L1/L2 – 1 s
- L1/L2 – 30 s

2 DAILY FILES

Available the following day.

Observation intervals:

- L1/L2 – 1 s
- L1/L2 – 30 s



TRIGNET USER ENGAGEMENT CHANNELS

1 STATUS MESSAGES



Built-in TrigNet text notifications.
Images are not supported.

X / TWITTER



Updates and alerts for TrigNet users.

3 WHATSAPP CHANNEL



Primary channel for TrigNet updates and operational information.

ADDITIONAL LINKS AND RESOURCES

TrigNet Website
www.trignet.co.za

X / Twitter
https://twitter.com/TrigNet_RSA

WhatsApp Channel
<https://whatsapp.com/channel/0029VbBENHIGpLHWjDaHBA3e>

Google Drive – Mount Point Information
https://drive.google.com/drive/folders/1E9Bt0-Zssj-CJWFclzPtyNq2X16zUjlk?usp=s_haring

Active Map
www.trignet.co.za/Map/SensorMap.aspx

FTP Site
<ftp://ftp.trignet.co.za>



CURRENT CHALLENGES

POWER

Power disconnections at host sites.

MULTIPATH

Changes to a station environment can affect observations.

SITE ACCESS

Limited access to some host sites.

BACKUP POWER

Inadequate backup power at some locations.

UPTIME

Maintaining 100% service uptime remains challenging.

FORMATS

Managing RINEX 2/3 and multi-constellation data changes.



TRIGNET: CONTINUITY THROUGH CHANGE

From a GPS-centred CORS network to a 70-station national network moving toward full multi-constellation tracking.

TrigNet continues to provide the national geodetic foundation for accurate, consistent positioning.

Thank
you



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