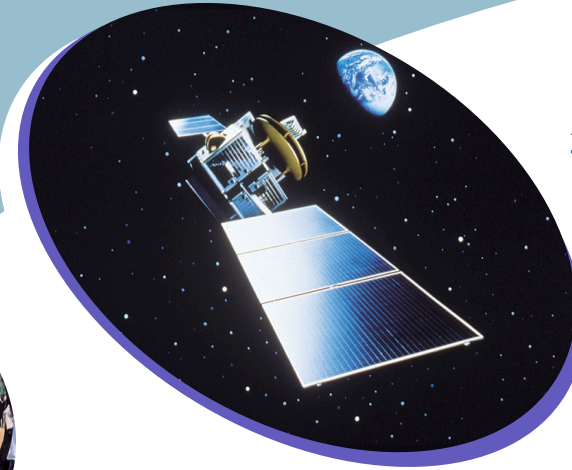*Alldean Satellite Networks (Kenya) Ltd*

*VSAT Networks for data
and voice communication in Kenya
Addressing universal access*

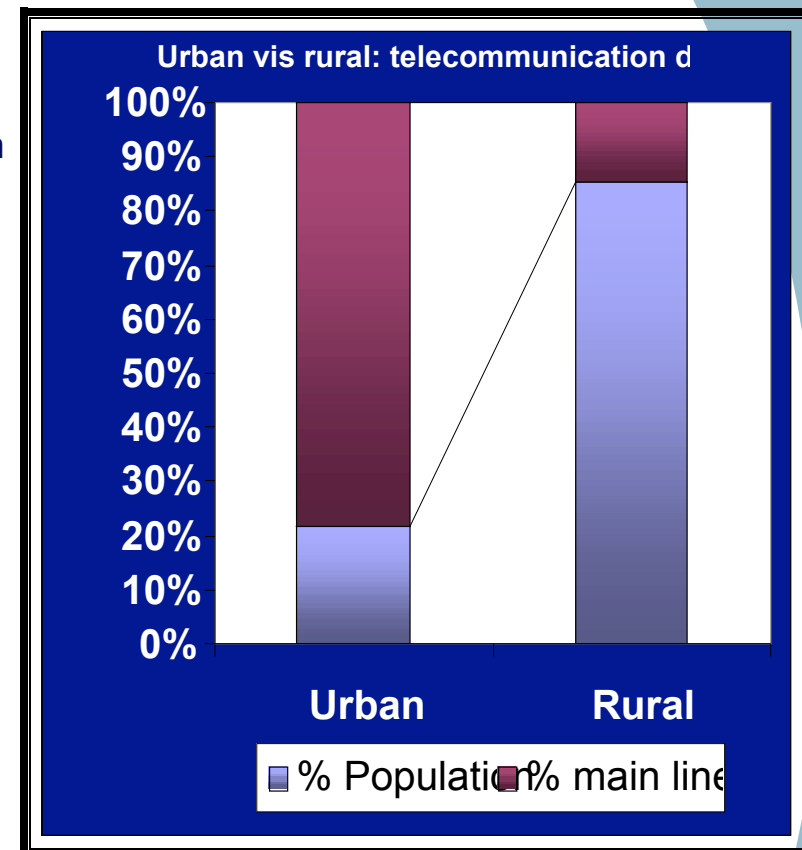*Thomas Ongeri Ombasa*

Objective

- The study addresses supply conditions of communications services to the rural/ suburban areas specifically;
  - Services targeting the rural areas
  - Challenges of supply
  - Cost of inputs relating to rural services
  - Competition framework as tool to reduce costs
  - Research and development for rural areas
  - Technology support for rural services
  - Availability of human resources and skills

Business environment: *infrastructure*

- **teledensity - 1% largely urban & 0.02% rural**

- **commercial power   accounts - 8% largely urban**

- **IT markets - vibrant with sales and support in main towns**

- **PC density - 0.7%**

Urban vis rural: telecommunication d

100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%

Urban   **Rural**

■ % Population ■ % main line

Challenges to providing Telecom *services to rural areas*

- *Economics*
  - Demand for Excusive Line Connections (ELC) low due to cost.
  - Profitability - rural areas have low revenue generation. Nairobi and Mombasa alone contribute 80% of the TKL revenues
  - Return on investment (ROI) in the rural areas does not justify going to certain areas hence recouping on the investment not so easy in the rural areas
  - *Cost structure* – higher cost of service provision in rural areas is in contrast with the lower capacity to pay for rural dwellers
- *Infrastructure*
  - Leased line access not adequate
  - There are obvious constraints in infrastructure i.e. electricity, water, access roads etc.
- *Security*
- *Human resources and of skill development structures*

Possible solutions to providing Telecom *services to rural areas*

- **Addressing special challenges to operators in their quest to provide rural communications**
  - Operators have initiatives to overcome challenges of higher availability
- **Convening forums that will address issues affecting stakeholders on a continuous basis**
  - Will help integrate rural development with other rural development issues .
  - Create synergy among the operator initiatives
- **Set policy guidance that prioritizes rural communications and set long term targets needed**
  - Will empower private sector to long term investment horizons
- **Avoid competitions that are detrimental for rural expansion while putting in place profitable strategies that enable national operators expand capacity rural areas**
  - Enhance frameworks that reduce input cost and enable operators go to the rural areas. E.g. bandwidth, VSAT and VOIP
- **Arrange funding mechanisms that supplement cost of operation in rural areas**
  - Taxation -give rebate for rural areas e.g. in manufacturing
  - Infrastructure –integrate rural development with UA
- **Address research and development structures tailored to the needs of the rural market**
- **Develop skill development schemes focused to human resource development that are supportive to rural needs**
  - Standardized curriculum is necessary but not to disadvantage rural areas.
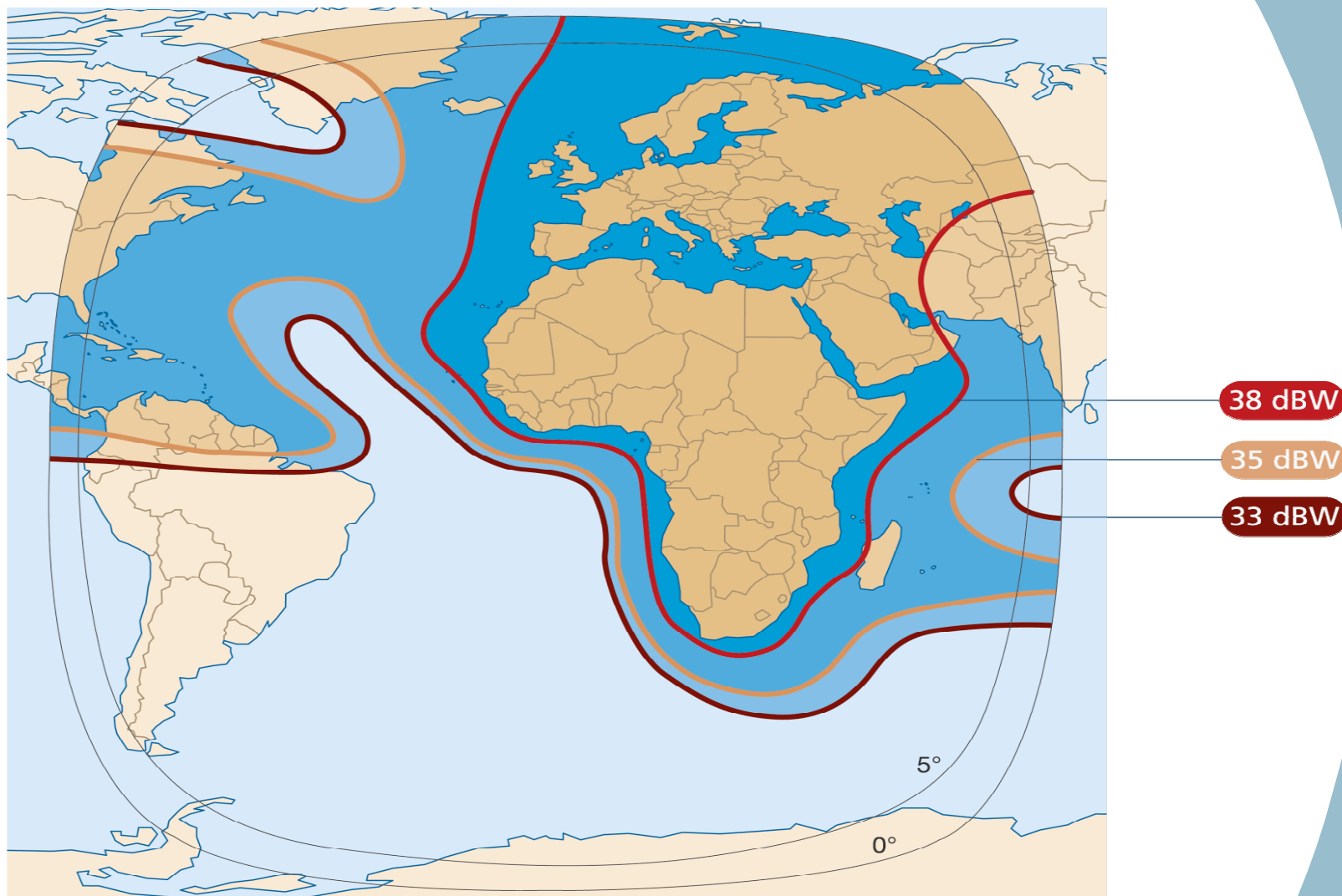
What measures are in place?

- An initiative by the Postal Corporation of Kenya and the Ministry of Information and Communication through a work plan of closing the communications gap and digital divide established that:
  - VSAT services utilize the latest satellite communications technology to provide seamless connectivity to enterprises anywhere in Kenya
  - Satellite technology is the most efficient and cost effective medium of communications for this geographical dispersed country
- One way through which this has been achieved is through the post offices which obviously have a large presence through out the country, with a post office in literary the most remotest of location in the country
- This initiative provides easy access to the internet and other ICT services to the rural areas

Why VSAT?

- **Flexibility: Quick deployment**

- **Security: High security measures inherent in the network design**

- **Cost: Lower cost than any alternative**

- **Immediate: Rapid implementation, addition of new sites within a day or two**

- **Scalability: Ability to scale it to user's requirements with low incremental costs (a system can expand from a few sites to a large number and can consist of tens of thousands of sites**
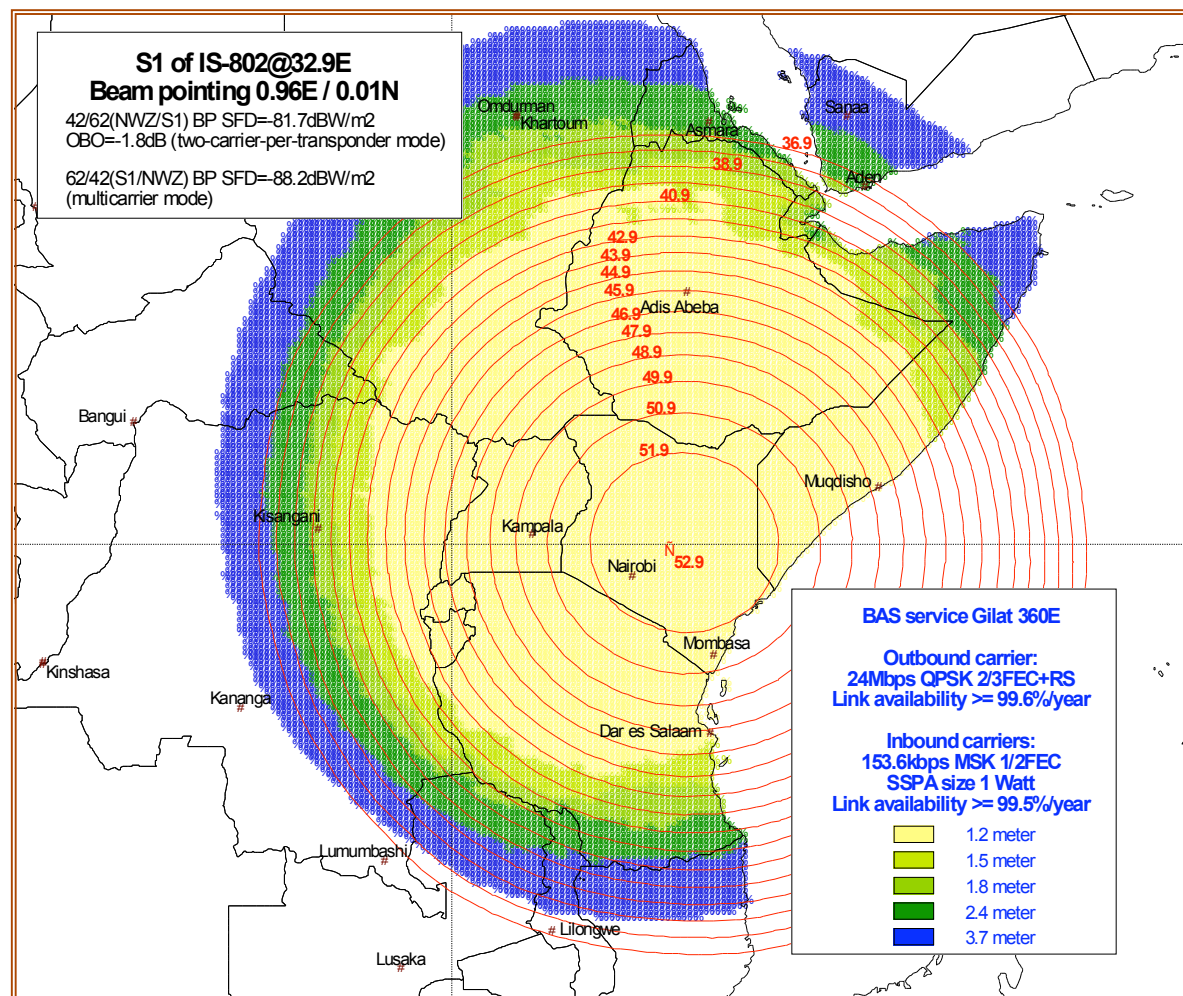
Satellite Beam Coverage
C-Band

38 dBW

35 dBW

33 dBW

5°

0°

Satellite Beam Coverage
Ku-Band

S1 of IS-802@32.9E
Beam pointing 0.96E / 0.01N
42/62(NWZ/S1) BP SFD=-81.7dBW/m2
OBO=-1.8dB (two-carrier-per-transponder mode)

62/42(S1/NWZ) BP SFD=-88.2dBW/m2
(multicarrier mode)

BAS service Gilat 360E

Outbound carrier:
24Mbps QPSK 2/3FEC+RS
Link availability >= 99.6%/year

Inbound carriers:
153.6kbps MSK 1/2FEC
SSPA size 1 Watt
Link availability >= 99.5%/year

- 1.2 meter
- 1.5 meter
- 1.8 meter
- 2.4 meter
- 3.7 meter

Satellite Earth Station
Nairobi

- **Earth station antenna**
  - C-band - 9.3m Andrew antenna
  - Ku-Band – 7.6m Andrew antenna
- **Satellite**
  - C-Band - Atlantic Bird 3 (Eutelsat)
  - Ku-Band – Intelsat 802
- **Hub Equipment**
  - Three Gilat products
  - Fully redundant
  - Climate Controlled Environment
- **Network Management Centre**
- **Help Desk - 24X7 support**

Advanced VSAT Technology

- **Three Gilat products**
- **Data and Voice communications**
- **Advanced patented FTDMA/ DVB-S access scheme**
- **Information Security (Frequency Hopping)**
- **Optimized TCP/IP implementation**

Skystar™ 360E
Corporate IP

DialAw@y IP™
Bundled VoIP & IP
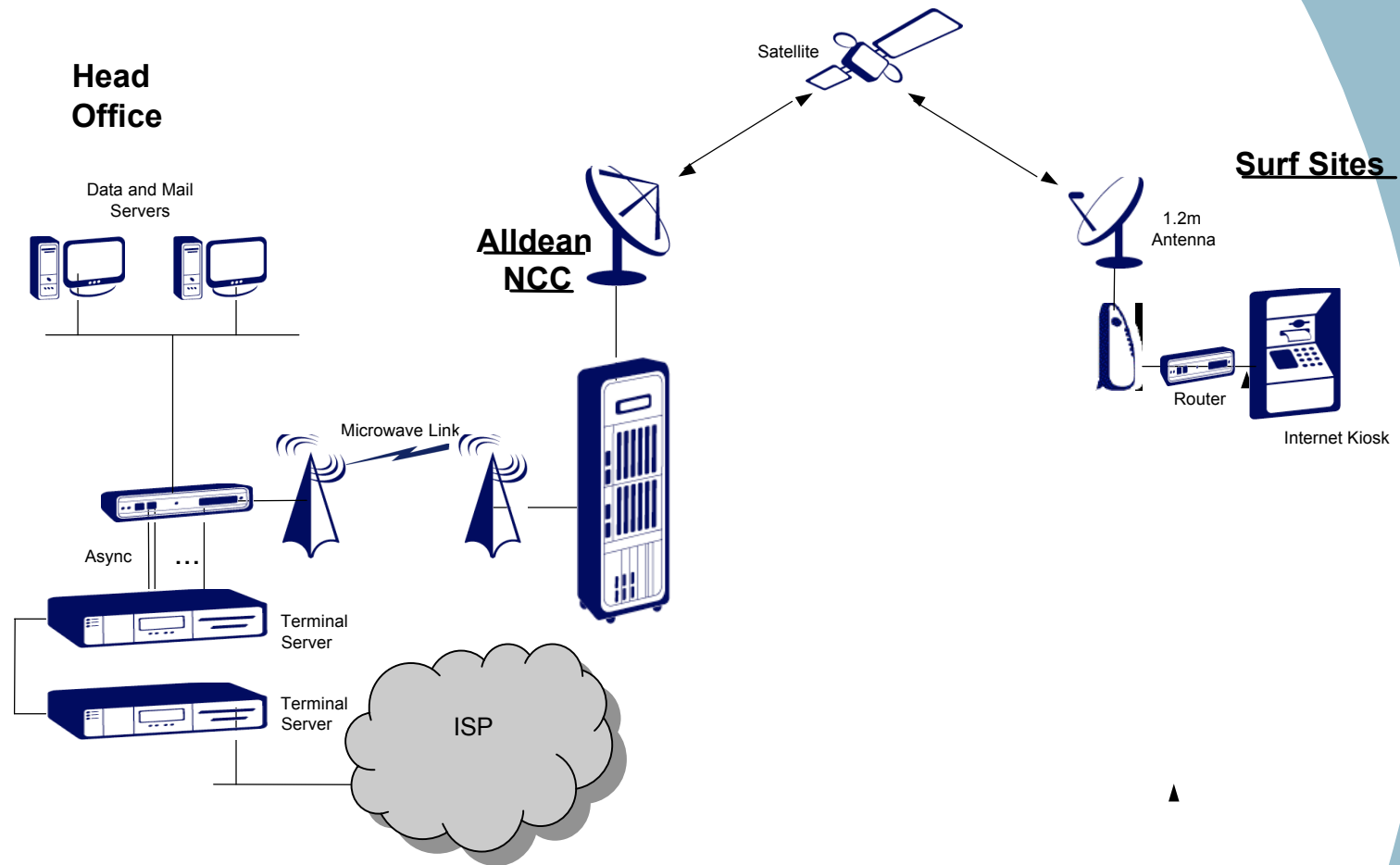
FaraWay™
Mesh Telephony and Data

Advanced VSAT technology

- The VSAT products provides high speed connectivity and toll-quality telephone services

- Each unit supports a PC/LAN connection and voice channels, providing a low cost solution for fulfillment of Universal Services/ Access Obligation. A group 3 fax transmission is made possible

- Internet access is provided by JamboNET connection supplied by Telkom Kenya Ltd.

- An asymmetric IP routing enables the hub transmit high speed outbound carrier up to 8MBps while the VSAT transmits an inbound carrier of up to 153.6 KBps

- VSAT enables connection of 3 PCs per site.

- Internet technologies i.e. TCP spoofing are incorporated to ensure a superior user experience

Network Configuration

Satellite

Head Office

Data and Mail Servers

Surf Sites

Alldean NCC

1.2m Antenna

Microwave Link

Router

Async ...

Internet Kiosk

Terminal Server

Terminal Server

ISP

Layout of VSAT in a local site

A typical cyber café

Surf kiosks

Problems & challenges

- Slow speeds at the moment due to available bandwidth constraints

- Literacy challenges

- Lack of human resources & skills

- Infrastructural access

- Security to equipment

- Deliberate vandalism either due to ignorance or cultural believes

Conclusions

- This effort has seen a total of 600 sites implemented in the last one year. A higher penetration has been recorded as well as an increase in web presence

- More sites to increase to well above 1000 sites across the country

- It is hoped that through this program:

  - Public office/ SOHO requirements for bundled telephony and internet access will be achieved

  - An extension to appropriately enable local schools and colleges access internet and ICT is foreseeable

  - Better points of sales services to the post office facilities based on the current site network configurations will be achieved

  - The Universal Service/ Access Obligations will be achieved

Your Ultimate Communication Solution

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