

ALTOBRIDGE

Cutting the Cost of Communications

Ultra Remote Village Networks

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Product Manager

Contents

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- Challenges to deployment of GSM solutions in remote areas
- Case study of a typical Two TRX Remote Satellite site
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Who We Are

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Altobridge is a leading provider of cost-cutting telecommunications solutions that include the award-winning technologies

LOCALCONNECTIVITY™

SPLITARCHITECTURE™

- Acquired MNS division of ADC Dec'09
- Hardware and Software development
- 150 employees; strong multi-national & *GSM* Industry background
- H.Q. in Ireland, with offices in USA, China & Malaysia
- Customers in US, Asia, Africa & Latin America
- Global Channel Partners
- RCS Group responsible for Remote Community Solutions within Altobridge

GSMA Associate Member

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Challenges for Remote GSM Deployment

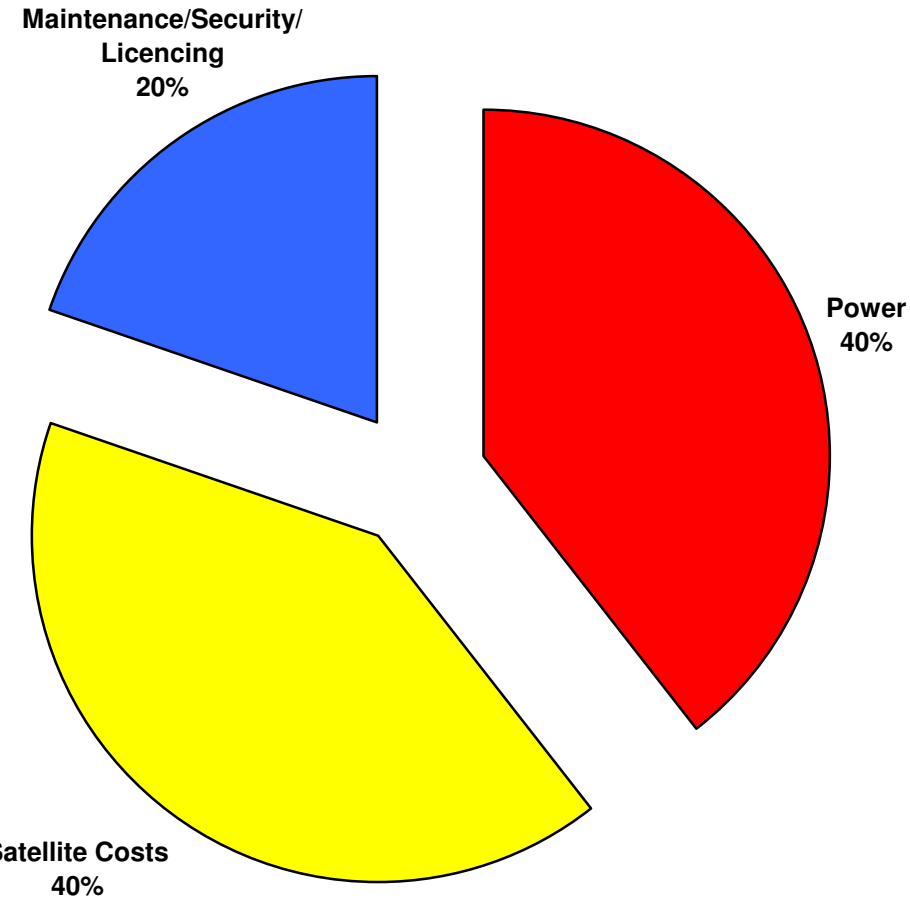


Remote GSM

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- Connecting next two billion GSM subscribers in remote parts of the world
- Transmission
- Power

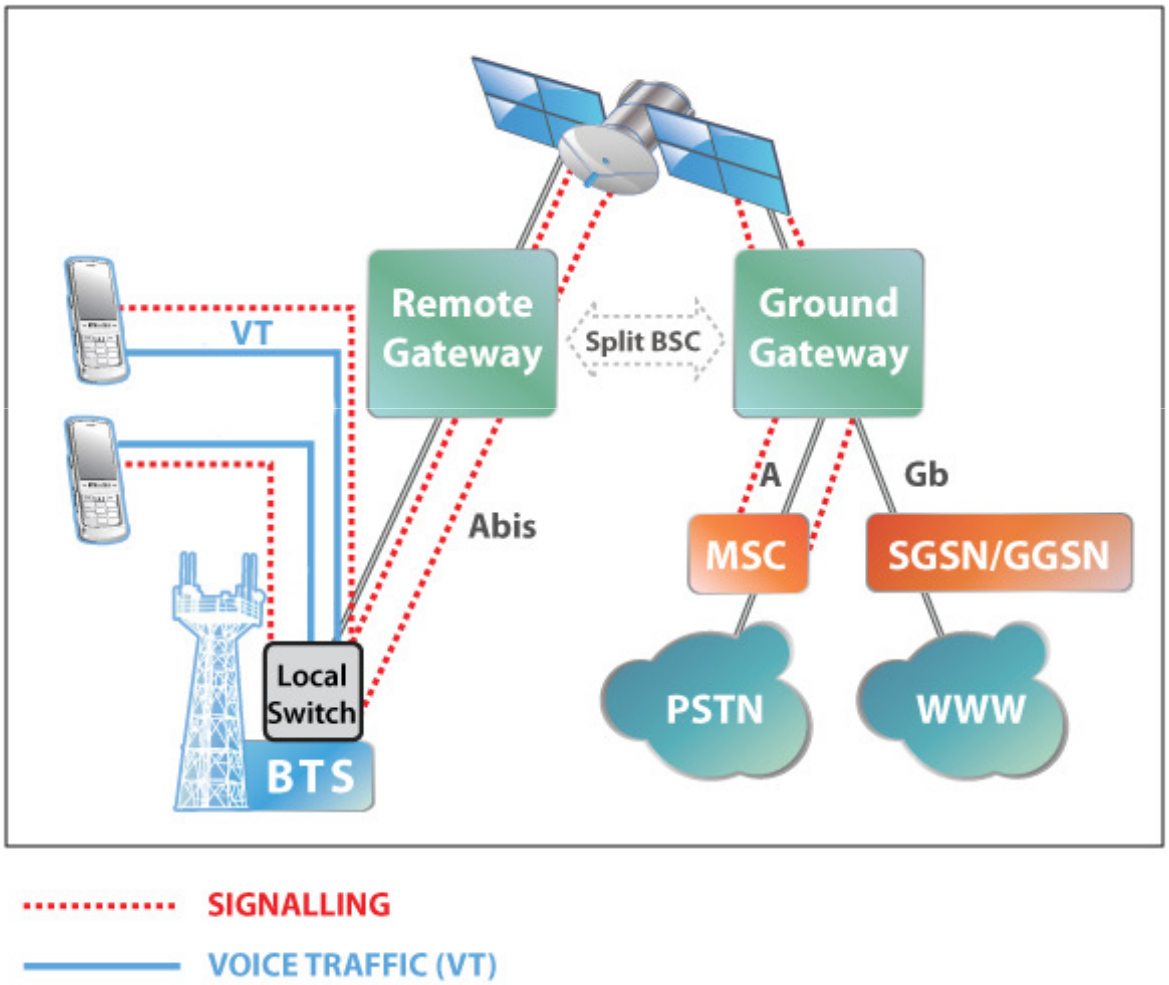
Breakdown of OPEX costs for Satellite site



Transmission

Altobridge Solutions

- Split Architecture™
  - Significant savings on satellite bandwidth
- Local Connectivity™
  - Calls switched locally, no backhaul requirements



Power

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Green Power for Mobile Programme Digicel Vanatu, 2009

- "Low site power is critical to the financial and technical viability of renewable energy sources. Intelligent selection of sites, telecoms equipment and cooling methods can significantly optimise the site power consumption"

- "Green power deployments should have remote monitoring telemetry in order to allow operators to monitor site power conditions and performance"

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Case Study – 2 TRX site in Rural Asia



Case Study – 2 TRX site in Rural Asia

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Profile of Site

- Remote Enterprise with 230 subscribers
- Average Traffic per Day ~ 40 Erlang, BH Traffic ~5 Erlang
- Power Consumption of BTS & VSAT Modem =155 Watts DC
- Total Power Consumption per day 4.680kWh
- Diesel generator

Case Study – 2 TRX site in Rural Asia



Traditionally-

- GSM rural sites dimensioned like GSM Macro sites;
  - Dimension for the Busy Hour
  - Additional TRXs adds extra power requirements

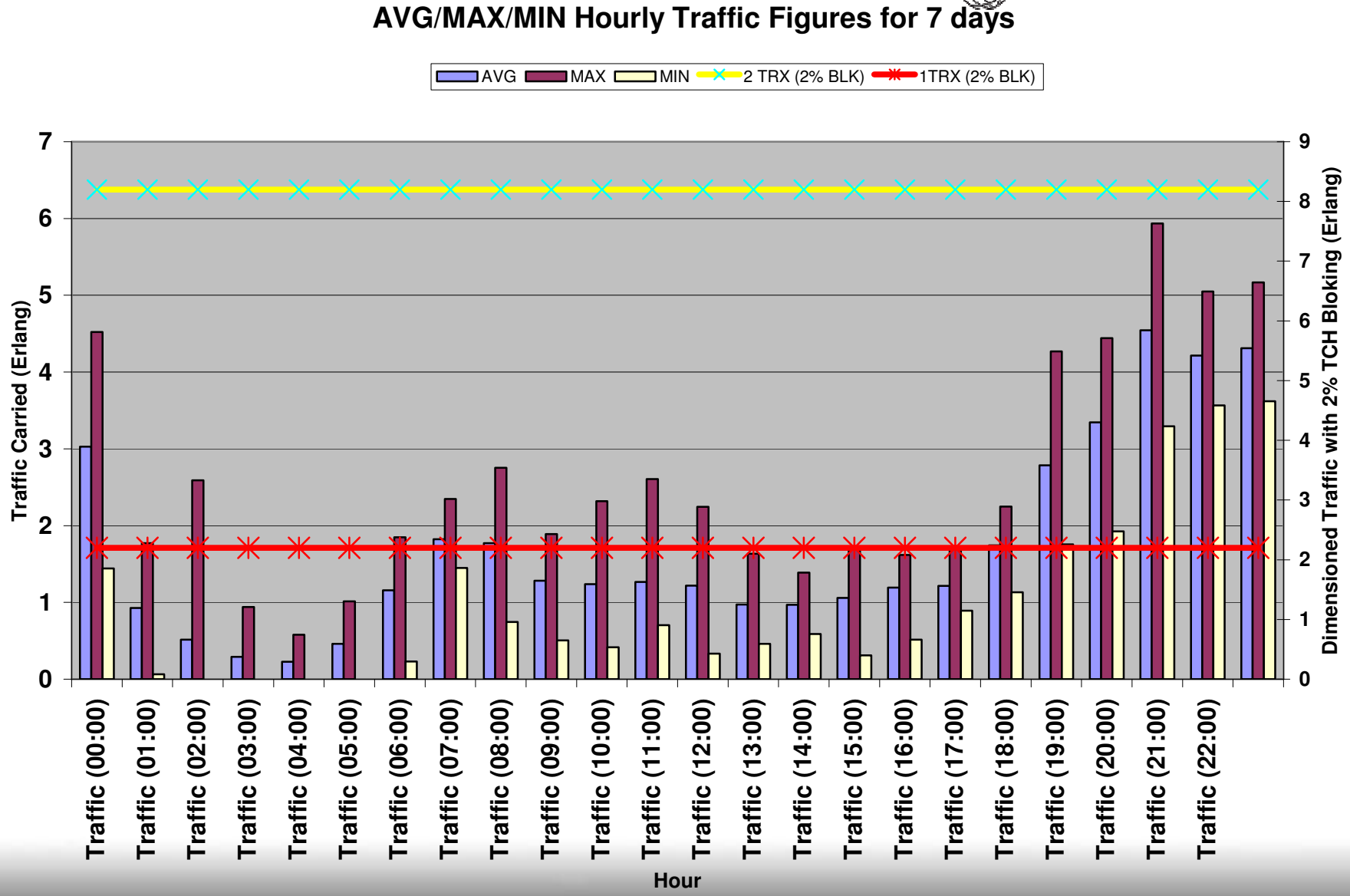
Case Study – 2 TRX site in Rural Asia

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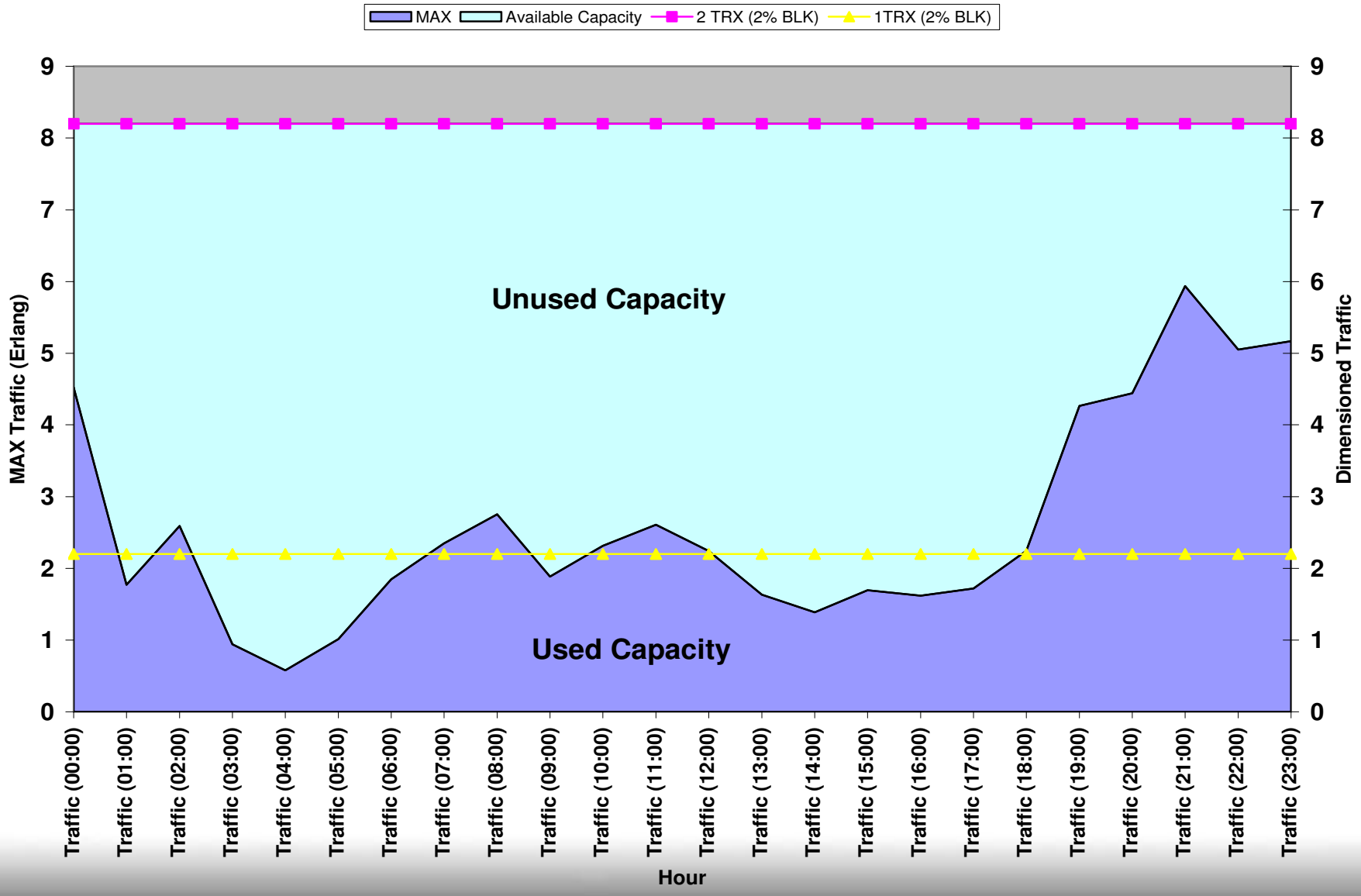
Task-

- Profile traffic of two TRX site to understand if it is possible to;
  - Turn off 2nd TRX at low traffic periods
  - Turn off 2nd TRX & VSAT Modem in low power mode at very low or zero traffic levels
- Calculated for the seven day Period (22nd to the 28th February);
  - **AVG** traffic for 00:00, 00:01 …23:00 for each hour
  - **MAX** traffic for 00:00, 00:01 …23:00 for each hour
  - **MIN** traffic for 00:00, 00:01 …23:00 for each hour

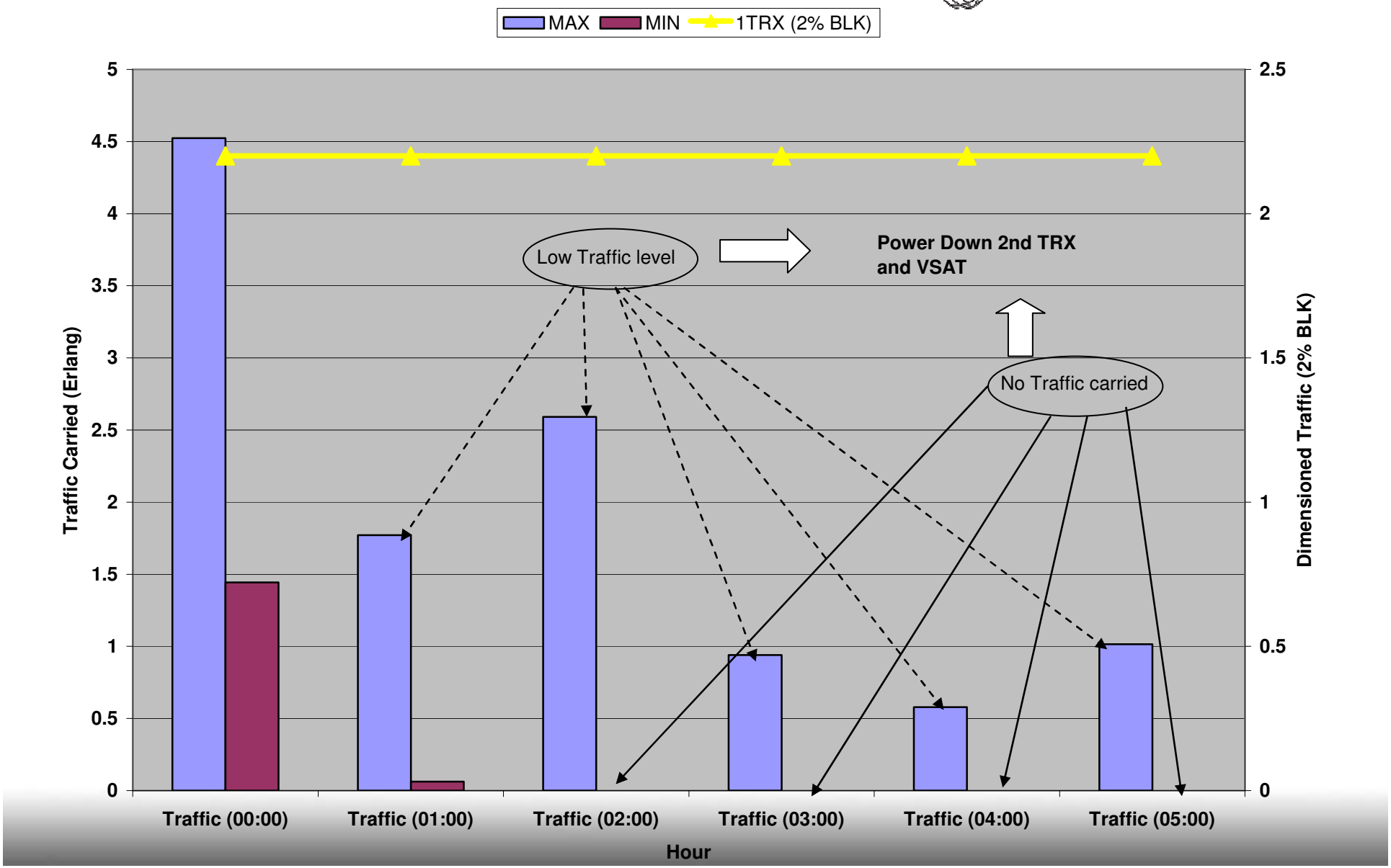
Traffic Analysis



Unused/Used Capacity – 2 TRX



Unused/Used Capacity – 1 TRX



Findings from Traffic Analysis



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- 2nd TRX only required at peak traffic hours

- Periods during night traffic is low or ~0 Erl

Conclusion

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OPEX can be reduced-

- Power off 2nd TRX in low traffic
- Place VSAT modem in Low Power Mode when no traffic on the site
- Less solar panels required
- Less batteries required

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Green Power Solution
For Remote Communities



AltoPOD for the Remote Community

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- Low Cost, low powered 2 TRX BTS
- Dual PA, 10 Watts per TRX
- Power consumption of 130 watts
- Zero Idle Traffic
  - (VSAT in “Low Power Mode”)
- Optimised for satellite backhaul
- Passive Cooling



Power Saving with AltoPOD

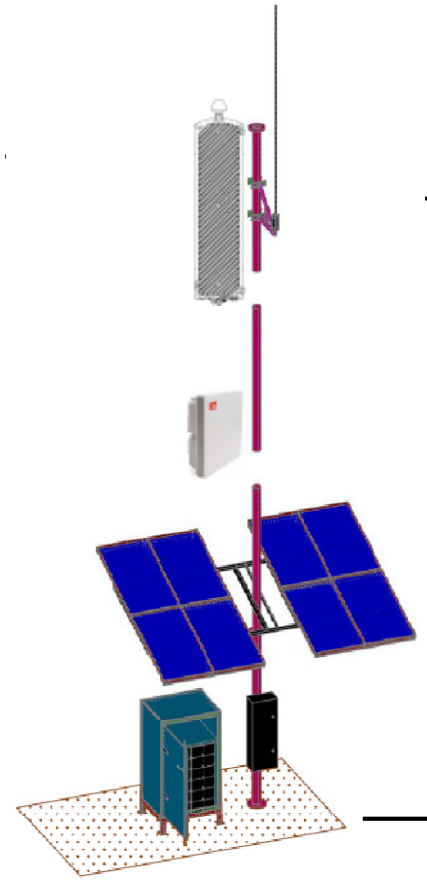
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- Existing 2 TRX Site 195 watt (incl. VSAT modem & RGW)
  = 4.680kwh
  per day
- AltoPOD
  - 6 hours @110 Watts (VSAT in low power mode&TRX2 shutd
  - 12 hours at 130 Watts (VSAT + 1 TRX)
  - 6 hours at 145 Watts (VSAT +BCCH + TRX 2)
    = 3.09kwh per day
- Estimated % Saving from Intelligent Power Management =35%



Site Optimised for Power

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OMNI or Panel Antenna

AltoPOD → Low Power BTS
- Passive Cooling
- Pole mountable
- Short Feeder cable

IP or TDM Microwave

Solar Panels → All DC power on site
- Zero CO2 emissions

Monitoring of power supply to fine tune dimensioning of solar system



Conclusion – Remote Community Solution

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Power

- **Lower Power BTS**
  - Lower Power consumption BTS
- **Intelligent Power Management**
  - Intelligent Power Amplifier Management
  - Increase power per TCH
  - Place VSAT in low power mode in low traffic (0 Idle Traffic)
  - Traffic Handling to minmise 2nd TRX usage
- **Power Monitoring & Adaptation**
  - Unique Monitoring of Power Supply
  - Allow optimal dimensioning of solar system
- **Physical**
  - BTS located close to Antenna to minimise feeder loss
  - Passive Cooling

Transmission

- **Split BSC**
  - Optimisation over satellite
- **Local Switching**
  - Reduced B/W as voice is local
  - Smaller satellite dish, less power

O&M

- **O&M**
  - Remote GSM Modem in Altopod
  - Battery Charge Telemetry

Environmental

- **Green BTS**
  - Solar Powered BTS

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