The Future of Fibre in South Africa

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FTTx challenges – Build Landscape

• South African Urban Density is Lower than other markets.
  ─ Low density increases Household Pass (HHP) Cost.
  ─ FTTB: 3 businesses per building in CBD’s, 2 in Office Parks

<table>
<thead>
<tr>
<th></th>
<th>Jo’burg</th>
<th>London</th>
<th>Nairobi</th>
<th>Delhi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households per km²</td>
<td>612</td>
<td>1,918</td>
<td>1,415</td>
<td>1,722</td>
</tr>
</tbody>
</table>

• Poor quality demographic data increases fixed build risk
  ─ Broadband propensity models are not readily available

• Poorly defined regulatory landscape
  ─ Limited access to incumbent brownfield infrastructure – mostly greenfield build
  ─ Infrastructure ownership vs. infrastructure procession is not clearly defined
  ─ Home building codes don’t include telecommunication infrastructure access standards
FTTx | Concept and definition of the technology

Fibre-To-The-x

FTTx is defined as an access network architecture from a central point directly to individual buildings in which the connection to the subscribers’ premises is Optical Fibre. The fibre optic communications path is terminated within the building for the purpose of carrying communications services such as data, voice and video at unprecedented high-speed access for the subscriber.

Use cases

- FTTH – Fibre to The Home for high speed internet connection with relatively high contention ratio.
- FTTS – High capacity Fibre To The Site (Mobile Base Stations)
- FTTB – Fibre To The Business with low contention ratio for guaranteed performance
- FTTC – Fibre To The Curb / Cabinet

Source: Adapted from FTTX Council
Building Codes and Access

- House Building codes should in future include Telecommunications infrastructure
  - Standards adopted
  - Ducts
  - Home Access Point

- Road building standards should allow slitting and micro trenching
  - Gated communities
  - Suburban roads

- Municipal relaxation for Over Head build
  - Leafy suburban areas where overhead power lines are already in place

- Relaxation of trenching depth standards in suburban areas
  - 450mm in areas of low civil activity

- Grants of Rights in estates is still a 6-18 month process
  - Market is moving faster than HOA’s
5 FTTx | Increasing synergies between Fixed and Mobile

- **THE MOBILE OPERATOR PERSPECTIVE**
  - Rapid bandwidth increase
  - Technology Evolution
  - More Diversified
  - More Dense
  - Metro & small cells
  - MBH, Fronthaul, Midhaul, WiFi offload
  - C-RAN, LTE-A, 5G
  - Explosive mobile traffic growth

- **THE FIXED OPERATOR PERSPECTIVE**
  - Deep fiber penetration
  - Deliver on the promise of 5G
  - FTTx, FTTN, FFTDp, FTTB, HFC
  - FTTH, FTTN, FTTDp
  - FTTH, FTTN
  - FTTH

Source: Adapted from Nokia
Connectivity | Customer expectations

Ambition | Leading footprint and performance

CPE Evolution | Introduction of 1Gbps home routers by 2018/2019

FTTx

- Upgrade from GPON to NG-PON2
- Greater capacities and wider footprint
- Focussed roll-out to key target-market

Market view (available today): Ultra-fast 802.11ac dual-band Wi-Fi router boosts speeds up to 3167 Mbps for low-latency online gaming, smooth 4K UHD video playback and extremely fast file-sharing.
Vodacom FTTX | Success, Improvements and Acceleration

Sales Acceleration
• External Direct Sales force significantly increased
• Significant increase in Retail Store sales

Service Delivery - Optimized Build
• New Standards implemented to achieve greater efficiencies
• Home Drop Cost savings
• Fast and Simplified single visit Home install

Distribution Network Build
End Points Passed YOY growth
• Significant growth on self-build
• Increased HHP rollout speed
• OSP build costs significantly reduced

1 Million HHP Target

Supplier Development and Build Partners
• Custom build partners
• Transfer of Existing Dark Assets
• Leased Fiber models
• Development of a regional build and support structure
FTTX Network Build Strategic Options

FTTX Target Market

- 3.6 mil households FTTX addressable market
- Vodacom has set a 1 mil passed target in 4 years
- 1 mil HHP Target – best revenue, best cost, highest deployment speed

Existing Dark Fibre Assets

- Existing Fibre networks not deployed specifically for FTTH market, IRU’s, Shares
  - Additional build required
- Shared existing fibre networks
- New Custom Deployment Leased Fibre
- Joining forces with Property Developers
- Total Target HHP about 20%

FTTX Build

- About 50% of build still required
  - Build at about 10-20K HHP per month for 3 years
    - 45 – 60 Regional Contractors
  - JV’s, Co-build partner
  - Appropriate Unit cost, Specification, Master Plan prioritization
  - Future support partners

The Bitstream Market

- Vodacom will Connect to about 15 Bitstream Networks this year
- Current Bitstream Suppliers – about 450K HHP with significant overlap
  - About 13 % of total addressable market
- About 30% of Total HHP Market
Supplier Development
Supplier Development | ICT Sector Codes

The ICT Sector Codes target for Supplier Development

Who qualifies:
- Must have a valid B-BBEE affidavit
- Must be an EME/QSE entity
- Must be ≥51% Black Owned
- Must be Regionally based

Qualifying Contributions

<table>
<thead>
<tr>
<th>Qualifying Contribution Types</th>
<th>Recognition Factor</th>
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<tbody>
<tr>
<td>Grant Contribution</td>
<td>100%</td>
</tr>
<tr>
<td>Direct Cost Incurred</td>
<td>100%</td>
</tr>
<tr>
<td>Discounts above normal</td>
<td>100%</td>
</tr>
<tr>
<td>Overhead costs for SD division</td>
<td>70%</td>
</tr>
<tr>
<td>Interest-free loan</td>
<td>70%</td>
</tr>
<tr>
<td>Standard loan</td>
<td>50%</td>
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<tr>
<td>Guarantees provided</td>
<td>3%</td>
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<tr>
<td>Lower interest rate</td>
<td>Prime - Actual</td>
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<tr>
<td>Minority investment</td>
<td>70%</td>
</tr>
<tr>
<td>Investment lower dividend</td>
<td>Ordinary - Actual</td>
</tr>
<tr>
<td>Professional Services zero rated</td>
<td>60%</td>
</tr>
<tr>
<td>Professional Services discount</td>
<td>60%</td>
</tr>
<tr>
<td>Vodacom Employees Time</td>
<td>60%</td>
</tr>
<tr>
<td>Preferential payment terms</td>
<td>&lt;15 days</td>
</tr>
</tbody>
</table>

Strategic Focus Areas

Focused Program that is specific to a specific initiative or area benefiting only qualifying suppliers in this area

Small Amount of Strategic Suppliers for long-term partnership

Initiative benefits all qualifying suppliers e.g. H&S management system
The below reflect if local suppliers in a specific area within a specific radius are appointed bearing in mind the H&S driving standards of limiting daily travel distance to 200km’s and the fact that more suppliers are required in densely populated urban areas:

• 39 SMME’s appointed on a radius of 100km’s;
• 18 SMME’s appointed on a radius of 150km’s; and
• 12 SMME’s appointed on a radius of 200km’s.

The volume of available works per allocated area will significantly differ due to aspects like population in area, availability of Vodacom infrastructure in the area, etc.
Supplier Considerations:

**FTTX Development Areas**

- Quality of Work
- Reinstatements
- Project Management Certification
- Health and Safety Gate 1 & 2
- Multi-disciplinary build capabilities
  - Conventional trenching, Overhead Build, Micro Trenching, Drilling, Managing Engineering difficulties
- Detailed Fibre Planning
- Wayleave applications
- Fibre Splicing
- Home Drop and Service Activation
- After Sales customer support

- Based in Small Regions
Closing Remarks

• The greenfield build opportunity is still significant in the South African FTTX market

• Vodacom would welcome partners in all three pillars of the build challenge
  – Existing Dark Fibre
  – Co-build, JV’s and Suppliers in the Greenfield build market
  – Bitstream Market

• Supplier Development will play a significant role in future build and support models