




# **THE ROLE OF FIBER IN THE ROADMAP TO 4G&5G in Bangladesh**

*April, 2017*



# Leading Wireless Infrastructure Provider in Asia

**First & Only Regional  
Towerco in Asia**

**~25,000**  
Towers owned/operated and  
managed

**12<sup>th</sup>**  
Largest Tower Company in the World

## Bangladesh

**~8,200 / ~1,400 towers**

- Build-to-suit
- Co-location
- Passive O&M
- Active O&M
- Energy

## Myanmar

**~1,250 towers**

- Build-to-suit
- Co-location
- Passive O&M
- Energy

## Cambodia

**~2,000 / ~1,000 towers**

- Build-to-suit
- Co-location
- Passive O&M
- Energy

## Malaysia

**~3,700 / ~4,800 towers**

- Build-to-suit
- Co-location
- Passive O&M
- Energy
- Fibre Resell

## Sri Lanka

**~2,200 / ~1,000 towers**

*(managed in partnership with Dialog Axiata)*

- Build-to-suit
- Co-location
- Passive O&M
- Energy
- Fibre Resell

## Pakistan

- Build-to-suit
- Co-location
- Passive O&M
- Energy

Source:

a) Global ranking source by TowerXchange 2016

b) Tower count per country as at January 2017.

c) Towers owned/operated by edotco

d) Towers managed by edotco



enabling connectivity

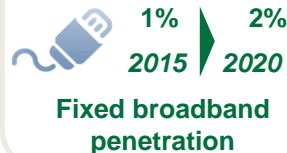
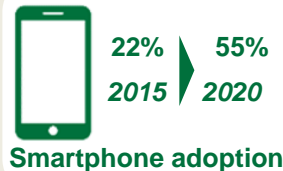
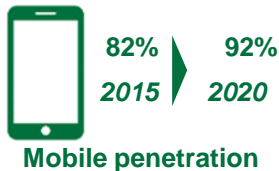
# The mobile telecom market will be driving the growth in the tower market

## Mobile and tower industry forecast



133m  
Total mobile users  
in 2015

157m  
Total mobile users  
expected by 2020



2G

99% population  
coverage

3G

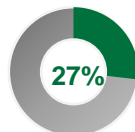
90% population  
coverage

4G

BTRC expected to  
auction 4G LTE  
spectrum towards  
beginning of 2017



**30,000 towers in Bangladesh currently**  
**12,000 – 15,000 new towers are**  
**expected to be built in the next 10 years**  
**New tower demand will be driven by rural**  
**coverage and data network**  
**densification requirements**







edotco  
Bangladesh  
tower  
market  
share

## Summary

- Bangladesh mobile market is still experiencing growth, with mobile penetration forecasted to reach 92% over the next ~5 years
- Smartphone adoption growth (from 22% to 55% in 2020) is expected to drive data demand and data network densification
- Mobile operators will have further coverage requirements in rural areas and for 4G rollout
- In 2015, 3,000 new towers were built and demand continues to grow. On average there are ~4,500 subs / tower, comparatively higher than the mature market benchmark of 1,500 – 2,000 subs / tower
- edotco Bangladesh retains the second largest tower portfolio with a market share of 27%

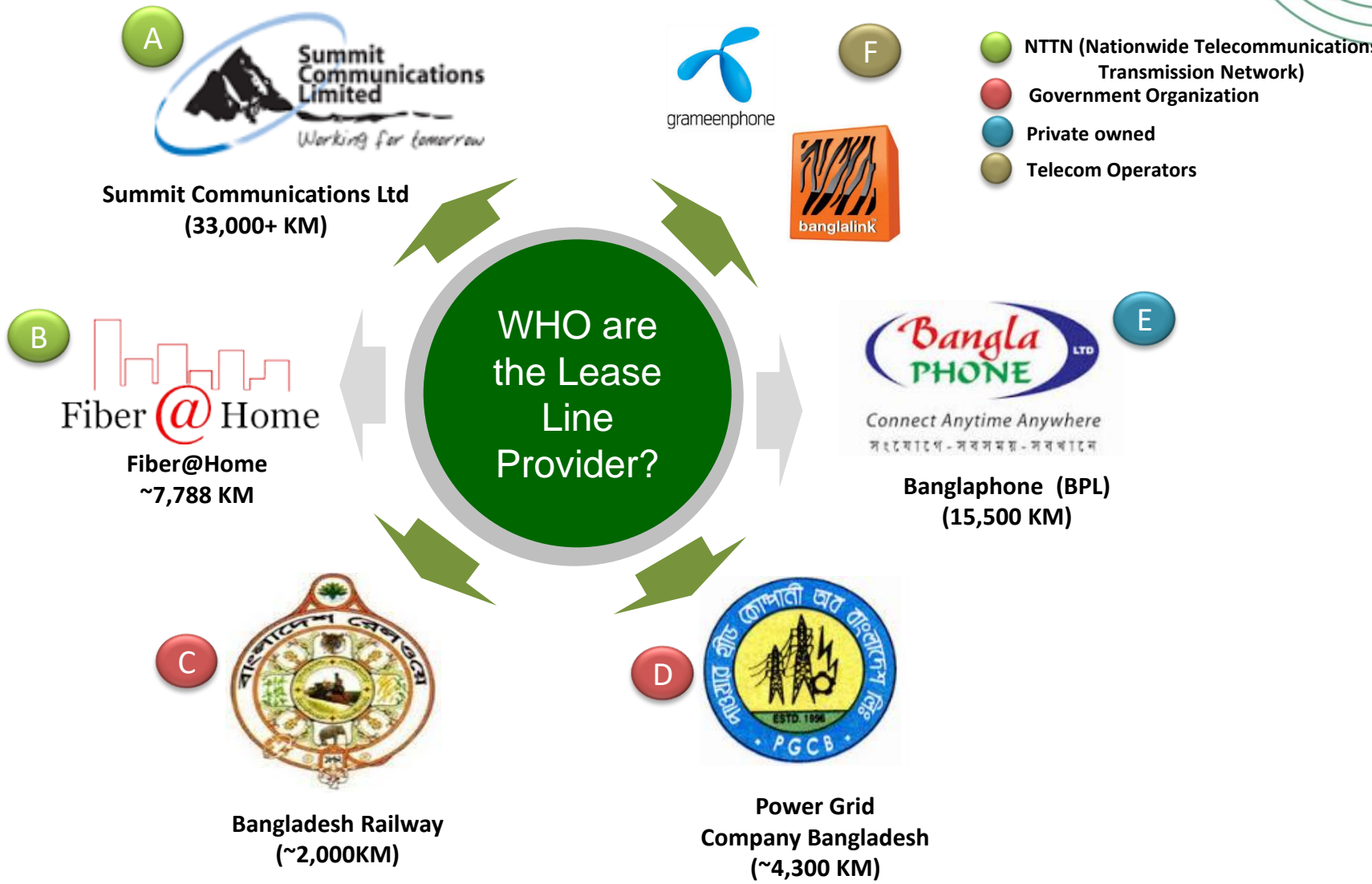
# Present Fiberization status in Bangladesh



Operators				
Nos of site Footprint	-12,000	~13,000	~8,900	~3,800
Nos of Fiberized sites	2G: 119 (1%) 3G: 2,865 (31%)	2G: 1,127 (11%) 3G: 1,082 (10%)	2G: 278 (3%) 3G: 190 (2%)	2G: 1,514 (50%) 3G: 1,514 (50%)
Operator's Fiber Length (km)	Own: 1,185 Leased: ~5000	Own: ~2,185 Leased: 2,800	Own: ~3,000 Leased: ~1000	Own: ~6000KM Leased: ~3000KM

# Present Fiberization status in Bangladesh

Who are the Fiber lease line provider?



# Backhaul challenges to deploy 4G/LTE in Bangladesh



Challenges	Details
A Capacity Enhancement	<ul style="list-style-type: none"><li>▪ LTE will exert additional strain on the existing backhaul capacity of operators due to increasing consumption of bandwidth hungry applications and services</li></ul>
B Country Infrastructure dynamics	<ul style="list-style-type: none"><li>▪ Only 3 NTFN operators (SCL, F@Home &amp; BTCL) are allowed to build/expand Fiber throughout the country<ul style="list-style-type: none"><li>▪ Poor footprint countrywide</li><li>▪ Lack of Telco standard reliability (SLA, QoS)</li><li>▪ Mostly Overhead laid Fiber &amp; lack of quality installation</li></ul></li></ul>
C TDM Network	<ul style="list-style-type: none"><li>▪ Existing Hybrid/TDM network needs to be upgraded to support full-IP solution for LTE</li></ul>
D Topological Modification	<ul style="list-style-type: none"><li>▪ Existing transport architecture needs to be overhauled for LTE (capacity growth, X2 interface, IP-synchronization)</li></ul>
E Cost of Ownership	<ul style="list-style-type: none"><li>▪ upfront cost is higher for operator's installation decision or leased from other Operators</li><li>▪ Maintain quality while reducing cost per MB</li></ul>
F Seamless Transition	<ul style="list-style-type: none"><li>▪ Seamless transition between 2G/3G and 4G (data &amp; Voice)</li><li>▪ Manage Current networks while migrating to 4G</li></ul>



## Lease Line from NTTN Operators

- NTTN Operators are going to expand fiber connectivity under info-sarker project by Y2020.
  - All government offices at the district level (55 offices for each District).
  - All government offices at the upazilla level (30 offices for each Upazilla).
  - Backbone Connectivity from 64 Districts to 421 Upazillas

## Network Topology

- Last mile (up to 3 hops) will be with microwave links.
- 100% aggregation and backhaul will be on fibre.
- Last mile fibre will be required for hot spots, enterprise, street solution etc.

## Capacity Planning

- For 3G : 10-25 Mbps
- For 4G/LTE :
  - 80% sites with 100-350 Mbps;
  - 20% sites with 500 Mbps – 1 GBps
- For 4G/LTE : Traffic forecast till 2021
  - Metro : 350 Mbps to 1 GBps;
  - Rural : 100 -150 Mbps
- Aggregation link will be 10G and 100G



# A new product inspiration of ours from Bangladesh

Move towards greener solutions



**Spiraling Bamboo Science Tower to Observe the Amazon Rainforest**



**Bamboo Scaffolding for Construction**



**The Strength and Abundance of Bamboo in Nature**



# A collaboration in R&D

Joint collaborative research –BUET and edotco



## Bangladesh University of Engineering and Technology

- Founded in 1912
- Oldest engineering institution for the study of engineering, architecture and urban planning in Bangladesh
- Largest structural engineering facility in the country.
- Modern structural software used like SAP2000, ETABS, STRAND7, STAADPro, DIANA



## Some Major On-going and Completed Projects by BUET Structural Engineering Division

- Development of Strategic Transport Plan (STP) for Dhaka Metropolitan Area
- Development Proposal for Uttara Residential Model Town (3rd Phase) Project
- 20-Storeyed Commercial Building of Shadharan Bima Corporation
- Design and Specification of Multistoried Building cum Car Park of Dhaka City Corporation.
- Design of East-West Inter-connector
- Contribution in the development of the Bangladesh National Building Code.
- Structural Design of Saidpur Bridge

# Pilot System in Operations

1 year planned POC

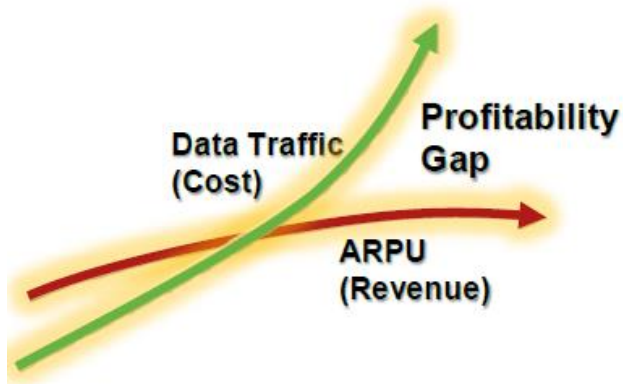


Serial ID	Structural Member	Max. Tensile Force (kN)	Allowable Tensile Force (kN)	Remarks	Max. Compressive Force (kN)	Allowable Compressive Force (kN)
1	Column (vertical)	31.62	54.00	Ok	33.15	78.00
2	Beam (horizontal)	0.04	54.00	Ok	5.13	78.00
3	Bracing (diagonal)	21.25	54.00	Ok	21.26	78.00

Max tensile force of bamboo= 120kN (allowable tensile force is 45%)  
Max compressive force of bamboo=130kN (allowable compressive force is 60%)

# Summary

## Managing the Demand and the new commercial dimensions -



## New directions for telcos

- In-house Apps
- B2B2C Business Model
- Enable content and Partnerships

## Smart infrastructure planning and utilization

- Offload Internet Traffic at edge
- Right cost network backhaul strategy
- Optimal use of transmission assets
- More rigorous sharing of infrastructure

## New experiences

- Innovative Services
- 3-Screen Experience
- Shifting quality of Video experience