



ITU-APT Foundation of India
**3rd India Spectrum Management
Conference**

Spectrum planning for Sub-1 GHz





Agenda

This session will explore the spectrum landscape below 1 GHz.

- **Date:** 16th October, 2023,
- **Time:** 11:00 am - 12:30 pm
- **Session Title:** - Spectrum planning for Sub-1 GHz
- **Session Topics:** Television, Low-band cellular, Direct broadcast to mobile, PMSE



Participants

Chair:

- Mr. Prashant Maru, VP, Sales & Business Development, Saankhya Labs.

Speakers:

- Mr. Prakash Moorut, Global Head of Spectrum & Regulatory Affairs, Shure Incorporated, USA
- Dr. Vinosh Babu James, Director, Technical Standards, Qualcomm, India
- Mr. Rajeev Kumar, Director (Engg), Doordarshan, India
- Dr. Adrish Banerjee, Next Generation Broadcasting, Chair Professor, IIT Kanpur, India
- Ms. Madeleine Noland, President, Advanced Television Systems Committee Inc., USA



Terrestrial Broadcast in India, sub-1 GHz

➤ Audio

- MW, SW, HFBC - Domain of national broadcaster – All India Radio
- FM – Permitted private operators along with national broadcaster
 - Spectrum allocated through auctions
 - City based auctions

➤ Video

- National broadcaster – Doordarshan
- Operates in VHF and UHF Bands
- Predominantly analog transmission
- Few DTT transmitters are working



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D2M: The Big Picture



Market drivers : User data consumption 2x every 3 years

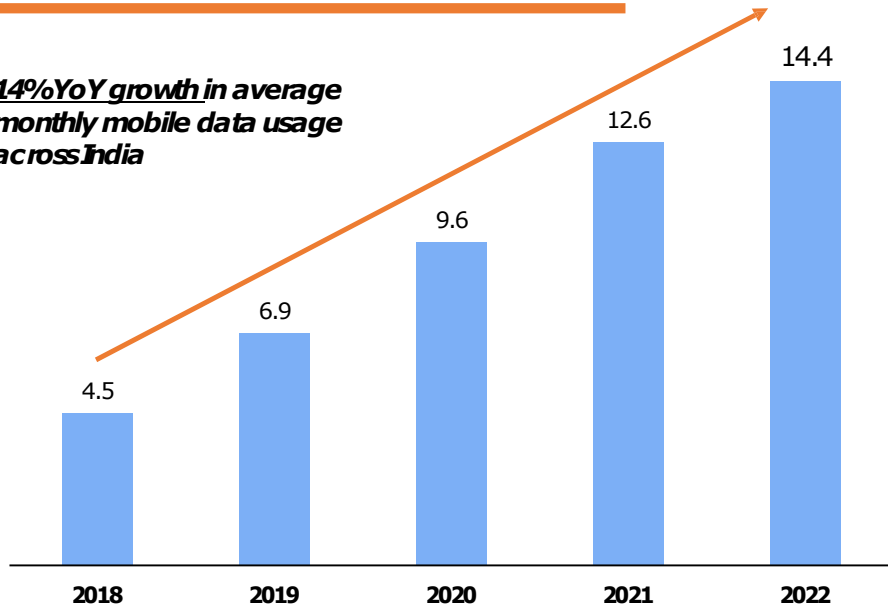
Growth of broadcast bit – Mobile video, EV auto and firmware/software updates

Cost of mobile data is going up

Cap-ex increase to double capacity exponentially increases

India Mobile Data Usage – Exabyte (EB) per month¹

14% YoY growth in average monthly mobile data usage across India



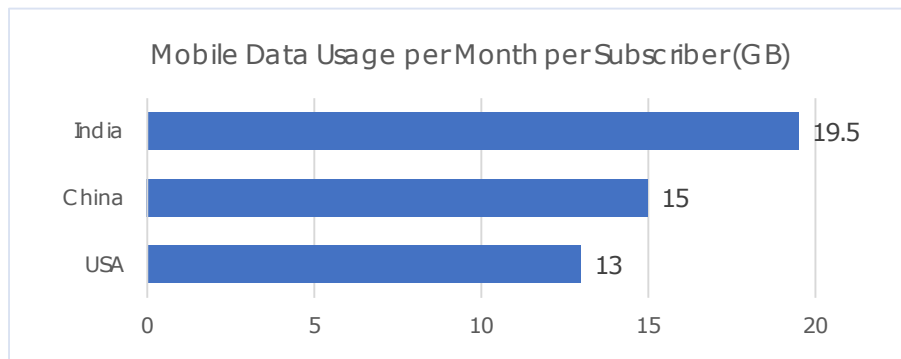
Content Type	Global Traffic Share ²	Key Players
Video	69%	
Social Networking	9%	
Software Updates	4%	
Web Browsing	3%	
Audio	2%	
Other (incl. Gaming & Extended Reality)	13%	

Source: 1) Nokia Mobile Broadband Index (MBIT) Report, 2023 2) Credit Suisse – Global TMT Sector, 2022



D2M Vision & Mission Statement

India Mobile Data Consumption



- Total mobile data consumed in India is expected to more than double by 2024¹
- 70% of traffic is Video traffic. Video traffic is consumed more in the rural parts than in the urban parts of the country
- Consumption is primarily restricted by mobile data price, which have been steadily increasing since late 2019

Source : 1) [Nokia: India Mobile Broadband Index 2023](#)

Mission and Vision

D2M + 4g = 5g like experience for video

D2M as a Public-Private Service can enable direct broadcasting of video/data to mobile devices and other smart devices at affordable costs bridging the digital divide as envisioned by the honourable Prime Minister



Large Opportunity in India : Unlimited video consumption



Content Access for 1.129B mobile phone users through ad backed FTA

- Convert **300M feature phones** to broadcast phone
- Access to unlimited curated Mobile Video Access
- User access to maps to these users through Broadcast and SMS



Opportunistic Video Offload on the lines of Wi-fi offload

- **Offload 25%** (5 GB in 2022) out of the average monthly usage of 19.5 GB (2022) data per subscriber
- High Viewership event offload
- OTT offload



Atmanirbhar Digital Public infrastructure deep tech platform

- Open OTT Broadcast stack
- Remote Education
- Deliver **Public Interest Content of National Importance** directly on their devices (emergency alerts/disaster response/public service messaging)

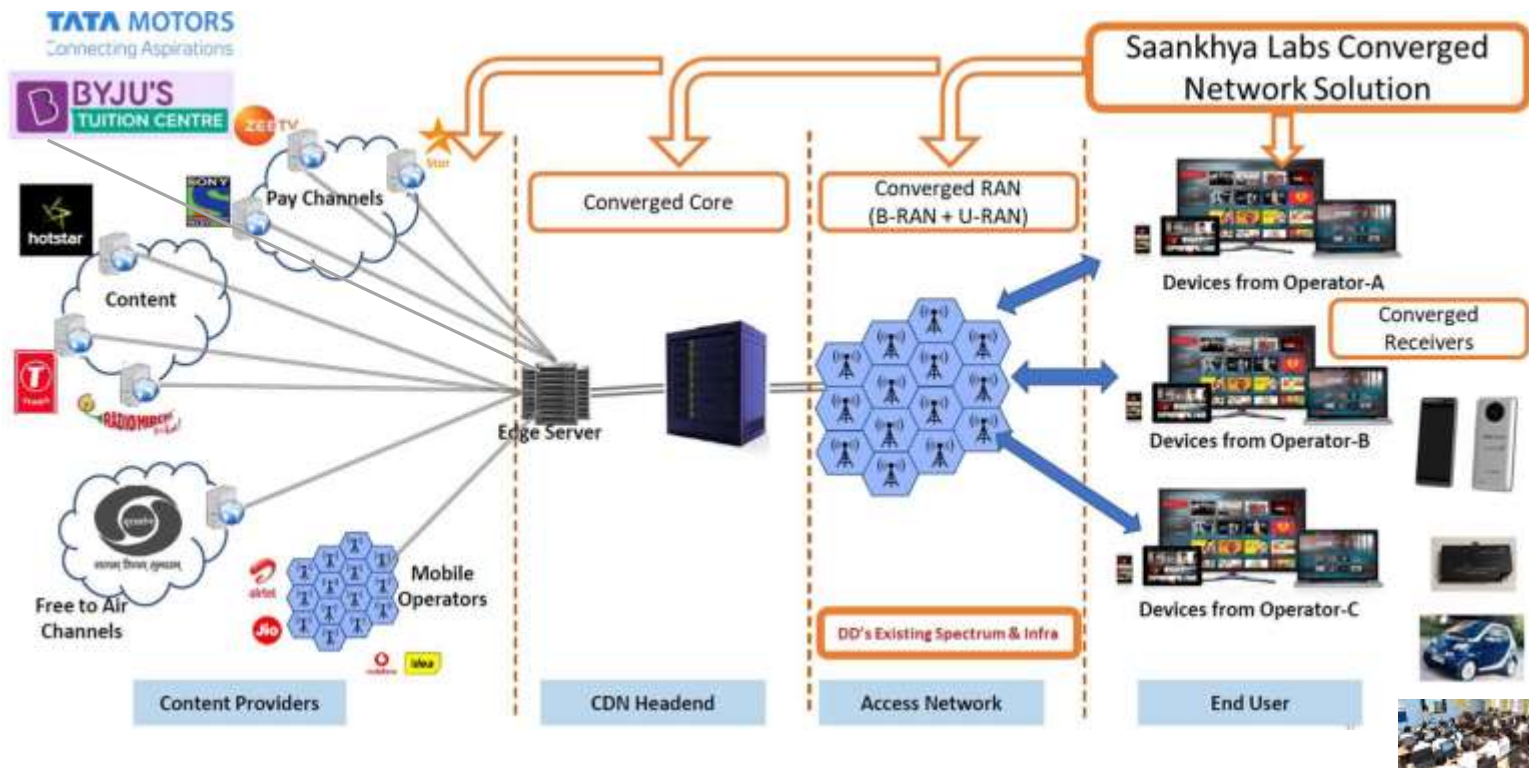


Local Semiconductor Industry in India

- New App processor
- Target to have low end smart phone with indigenous app processor



D2M Cloud based distribution platform : Target 100M users

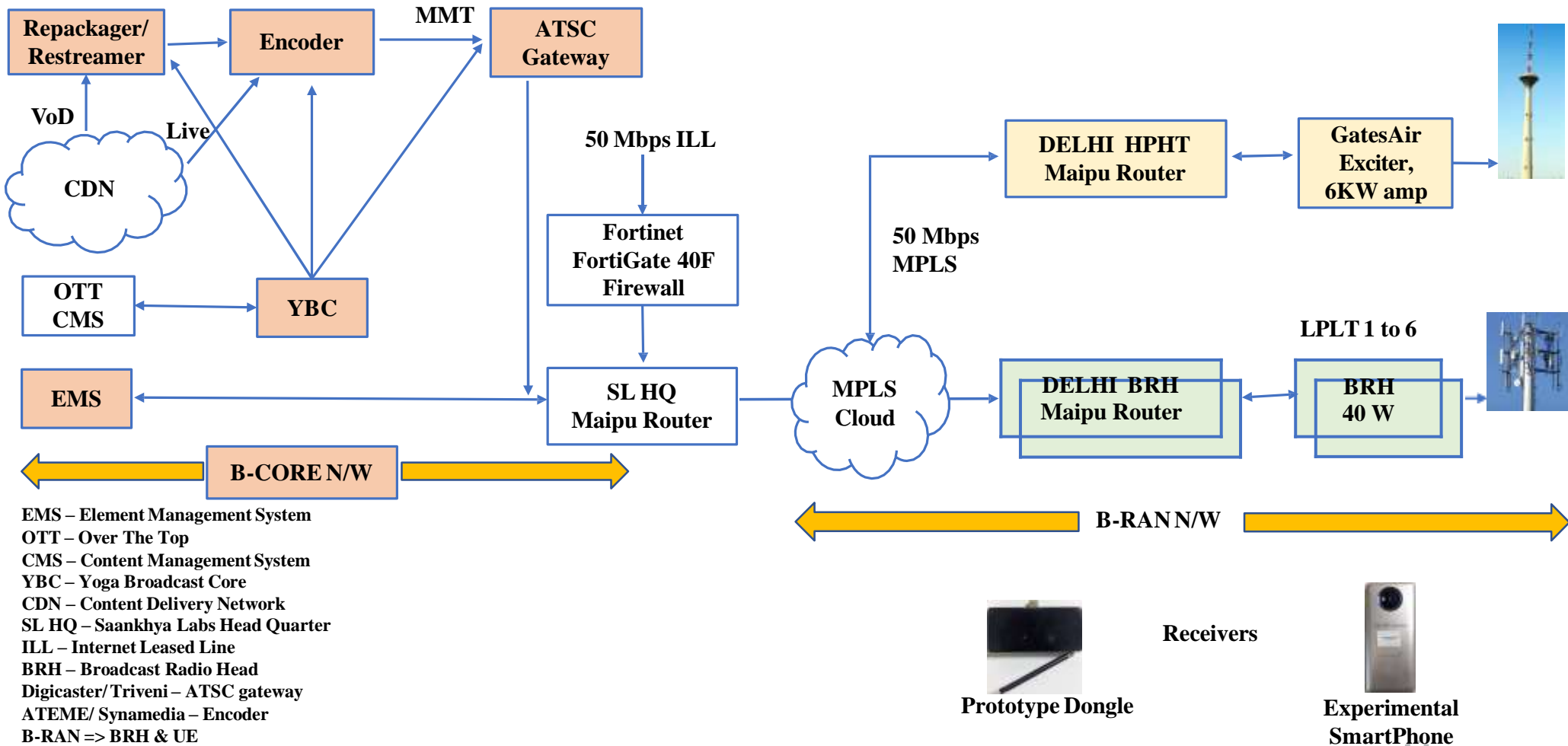


Pre-existing successful template in “FreeDish” DTH with 58M subs

PPP initiative with a B2B2C biz model

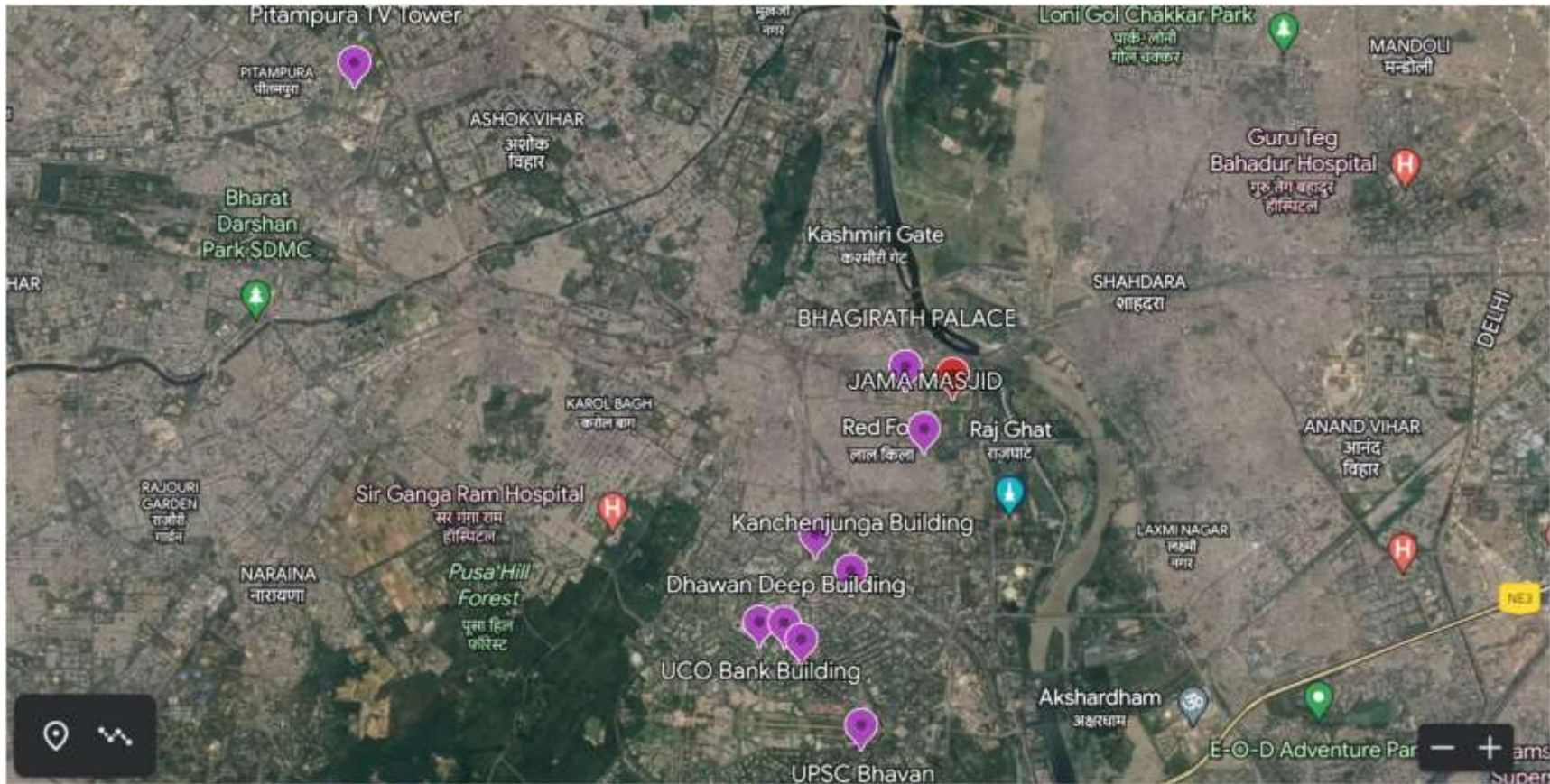
Vendor neutral
Shared infrastructure

Delhi Field Trial – Overview



- EMS – Element Management System
- OTT – Over The Top
- CMS – Content Management System
- YBC – Yoga Broadcast Core
- CDN – Content Delivery Network
- SL HQ – Saankhya Labs Head Quarter
- ILL – Internet Leased Line
- BRH – Broadcast Radio Head
- Digicaster/Triveni – ATSC gateway
- ATEME/ Synamedia – Encoder
- B-RAN => BRH & UE

BRH Site Locations (HPHT & LPLT)





Use Cases

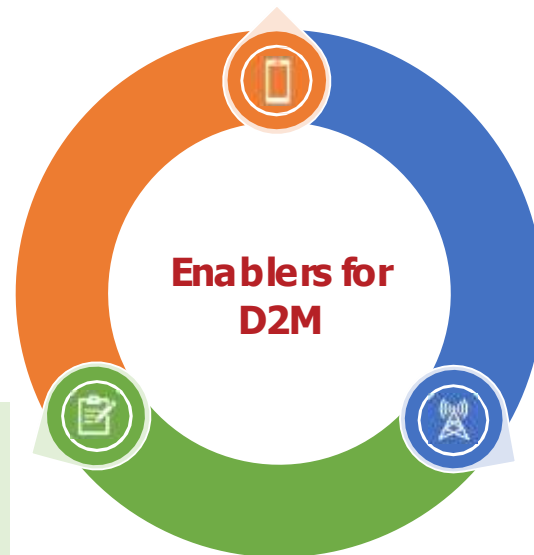
- Remote Education
- Public Content Broadcast
- Live & OTT Content Broadcast
- Mobile Network Operator Offload
- Emergency Alerts & Notifications
- Firmware / Software over the Air



Enablers/Challenges for D2M Deployment

Device Side Ecosystem

- Work with a local phone manufacturer
- Mandate like the NAVIC



Enablers for
D2M

Regulatory Policy Initiatives

- Formation of a consortium of content, device makers and service providers
- Spectrum policy
- PPP model of investment

Transmit Architecture

- Dense enough to provide ubiquitous coverage and "fat" pipe
- BRH style hybrid deployment



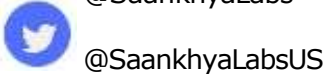
Thank You

Saankhya Labs Pvt. Ltd.

Embassy Icon Floor 3, No. 3, Infantry Road
Bengaluru – 560001 Kamataka, India

Phone +91-80-6117 1000 **Email** info@saankhyalabs.com

www.saankhyalabs.com





Prepositioning Content

- Audience behaviour is deconstructed into 3 categories
 1. Repetitive Viewing - There are repetitive viewing behaviors within VoD. Audiences predictably watch new episodes of popular series on a periodic basis. All such repetitive and periodic viewing can be serviced through datacasting where the content is pre-positioned through broadcasts.
 2. Live Viewing - A lot of live news and live sports is being consumed on streaming. Offloading this live content to broadcast can save on data costs.
 3. Random Browsing - In future AI can be used to also pre-position popular VoD using datacasting that are currently being consumed through random browsing based on algorithmic recommendations.

