HFCL

Bridging the Digital Divide: 5G FWA Solutions

Challenges of Traditional Fiber Deployment

1 Cost of Deployment

FTTH incurs a high initial deployment cost per subscriber, due to the need for physical fiber installation, trenching, and infrastructure expansion

2 Deployment Time

Long deployment time due to physical cable trenching, permissions, and complex civil works.

3 Reach & Geographic Barriers

Economically unviable for remote or rural areas due to infrastructure challenges.

India Broadband Market Analysis

Only 13% of households have wired broadband.

This covers about 35 million homes.

Opportunity: ~100 to ~150 Mn homes


HFCL
But what if there was a
Better Way?

Introducing 5G FWA: A Wireless Solution

1 Tackling Physical Infrastructure challenges

5G FWA leverages existing cellular networks, eliminating the need for extensive cabling and trenching.

2 Reliable Connectivity

Delivers high-speed reliable broadband over the air, offering comparable speeds to fiber.

3 Reaching Underserved Areas

Provides a cost-effective and efficient way to extend broadband services to rural and remote regions.

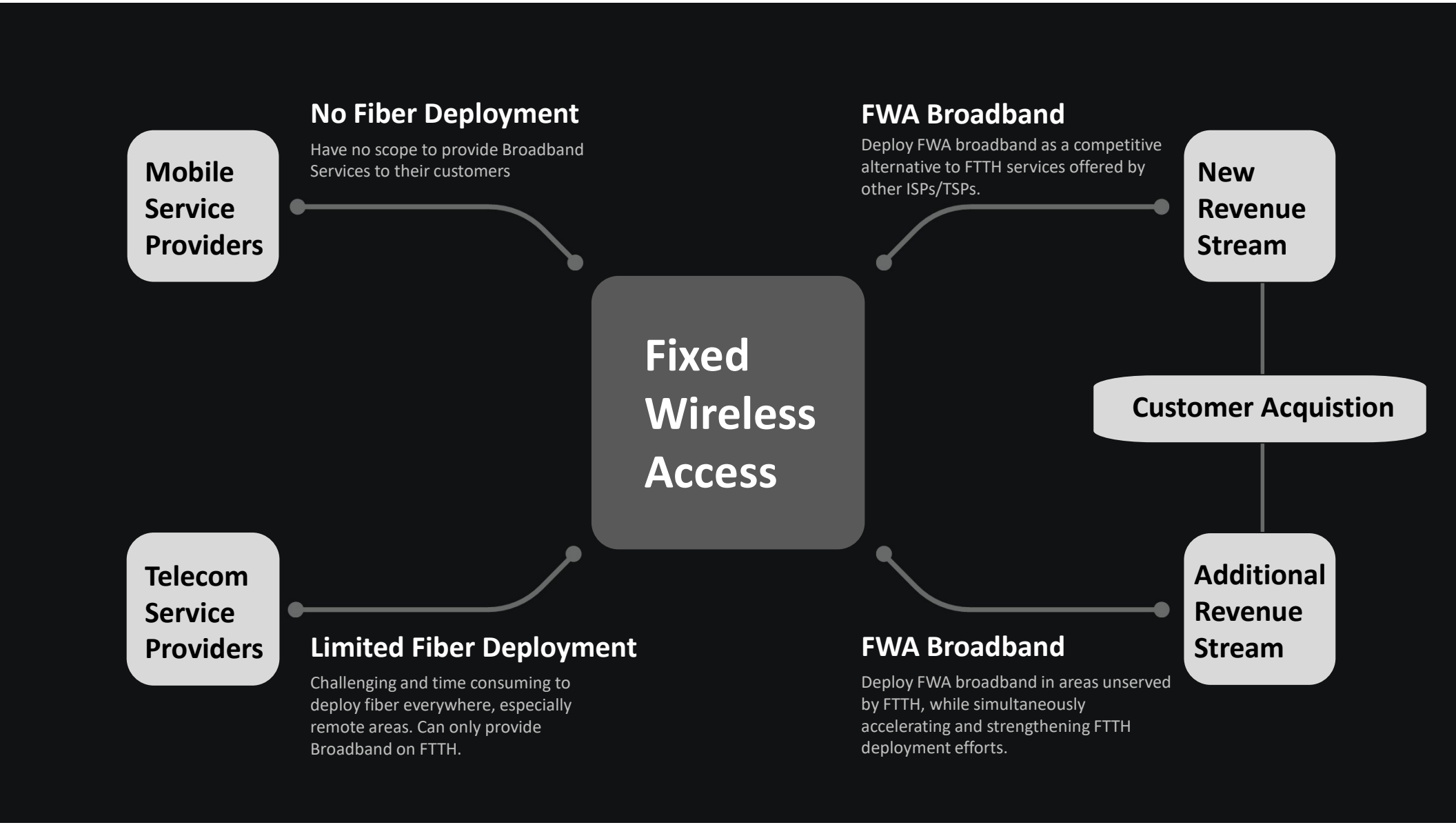
5G FWA: The Game Changer

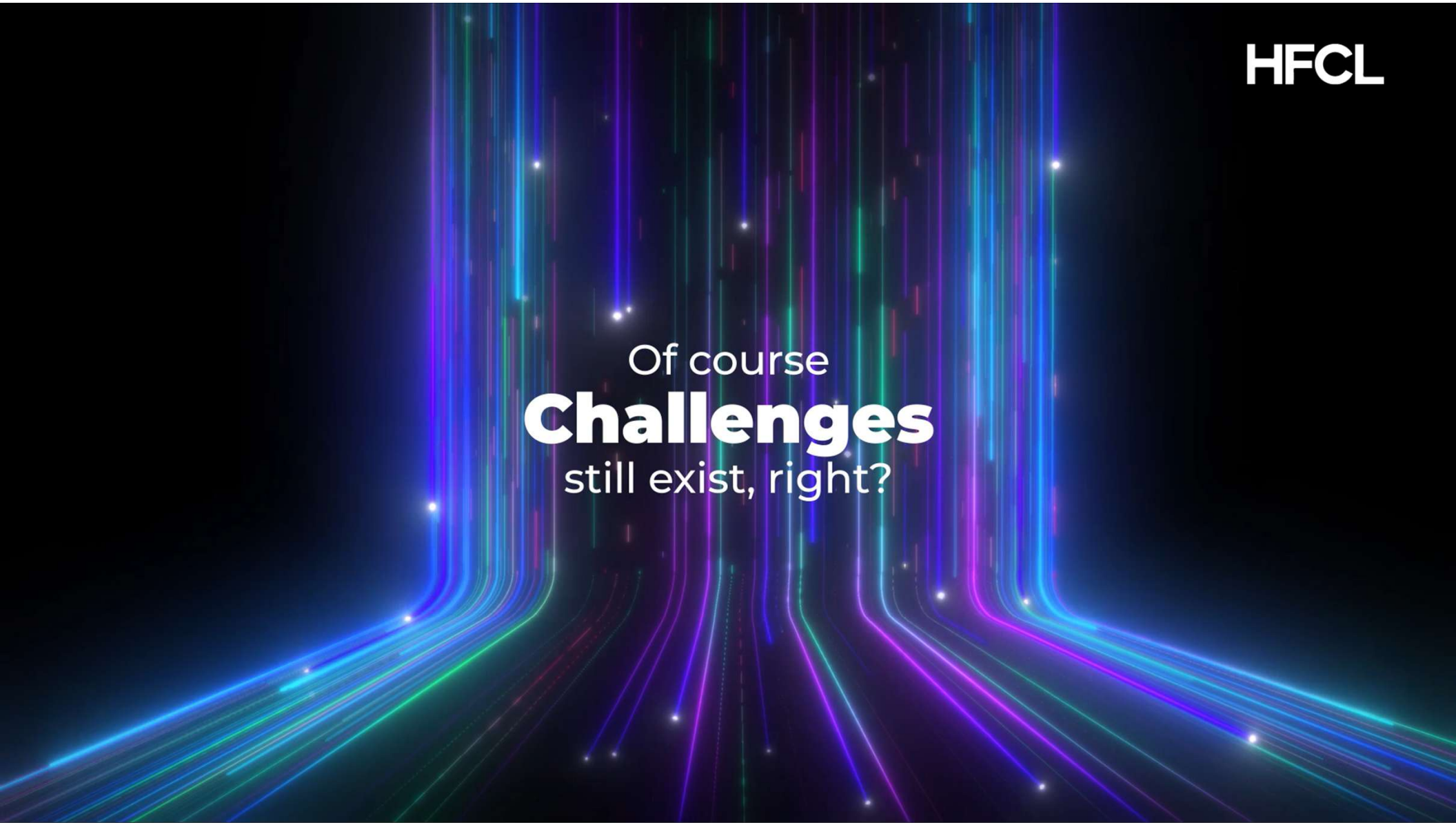
Benefits for Customers

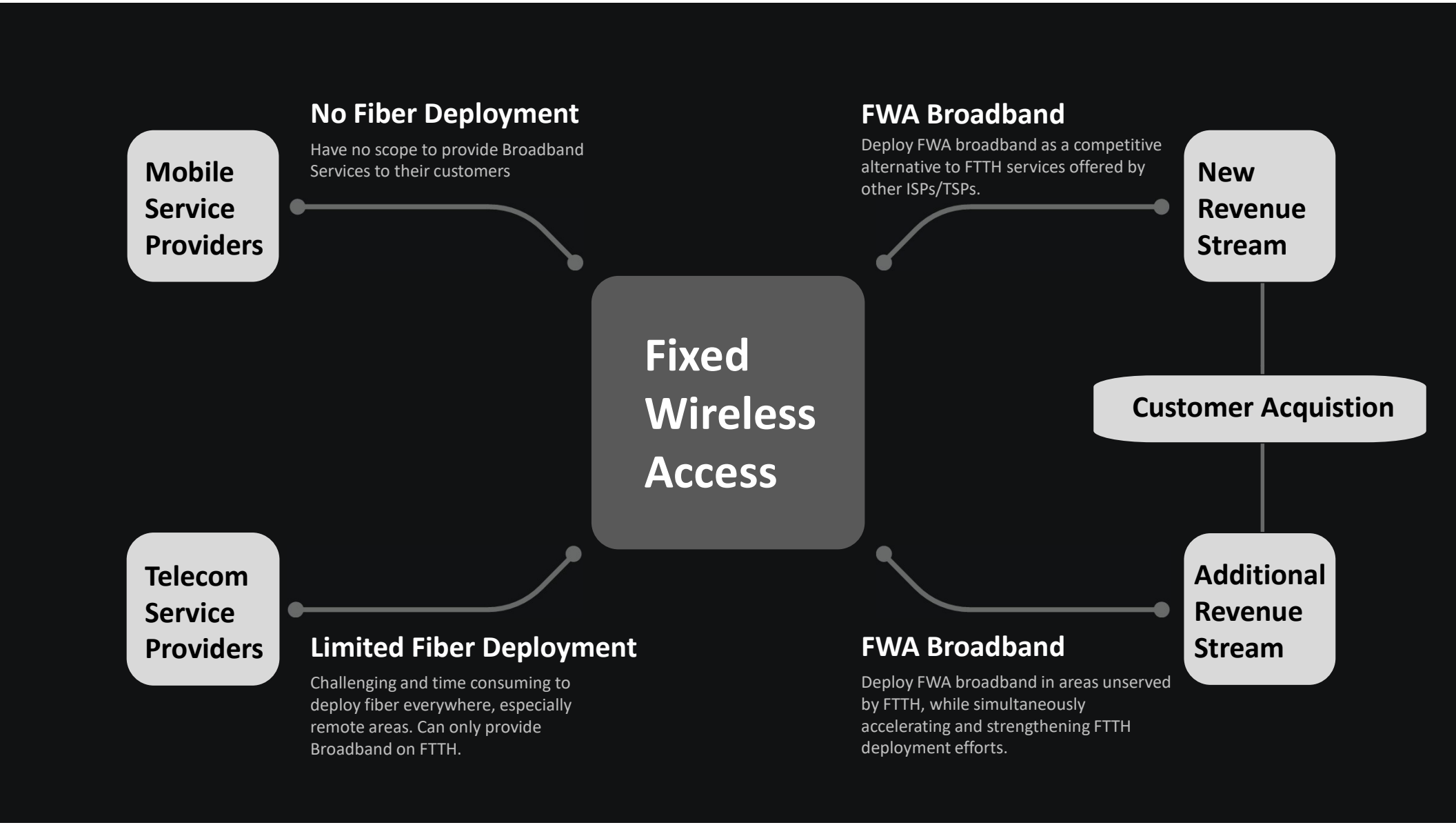
- Affordable High-Speed Internet
- Reliable Performance
- Better Connectivity and Flexibility

Empowering Operators

- Reduce Congestion, Offer more Bandwidth
- New Revenue Streams: FWA, Enterprise 5G
- Deeper Broadband Penetration


Mobile Service Providers
No Fiber Deployment
Have no scope to provide Broadband Services to their customers
FWA Broadband
Deploy FWA broadband as a competitive alternative to FTTH services offered by other ISPs/TSPs.
New Revenue Stream
Fixed Wireless Access
Customer Acquistion
Telecom Service Providers
Limited Fiber Deployment
Challenging and time consuming to deploy fiber everywhere, especially remote areas. Can only provide Broadband on FTTH.
FWA Broadband
Deploy FWA broadband in areas unserved by FTTH, while simultaneously accelerating and strengthening FTTH deployment efforts.
Additional Revenue Stream


HFCL
Of course
Challenges
still exist, right?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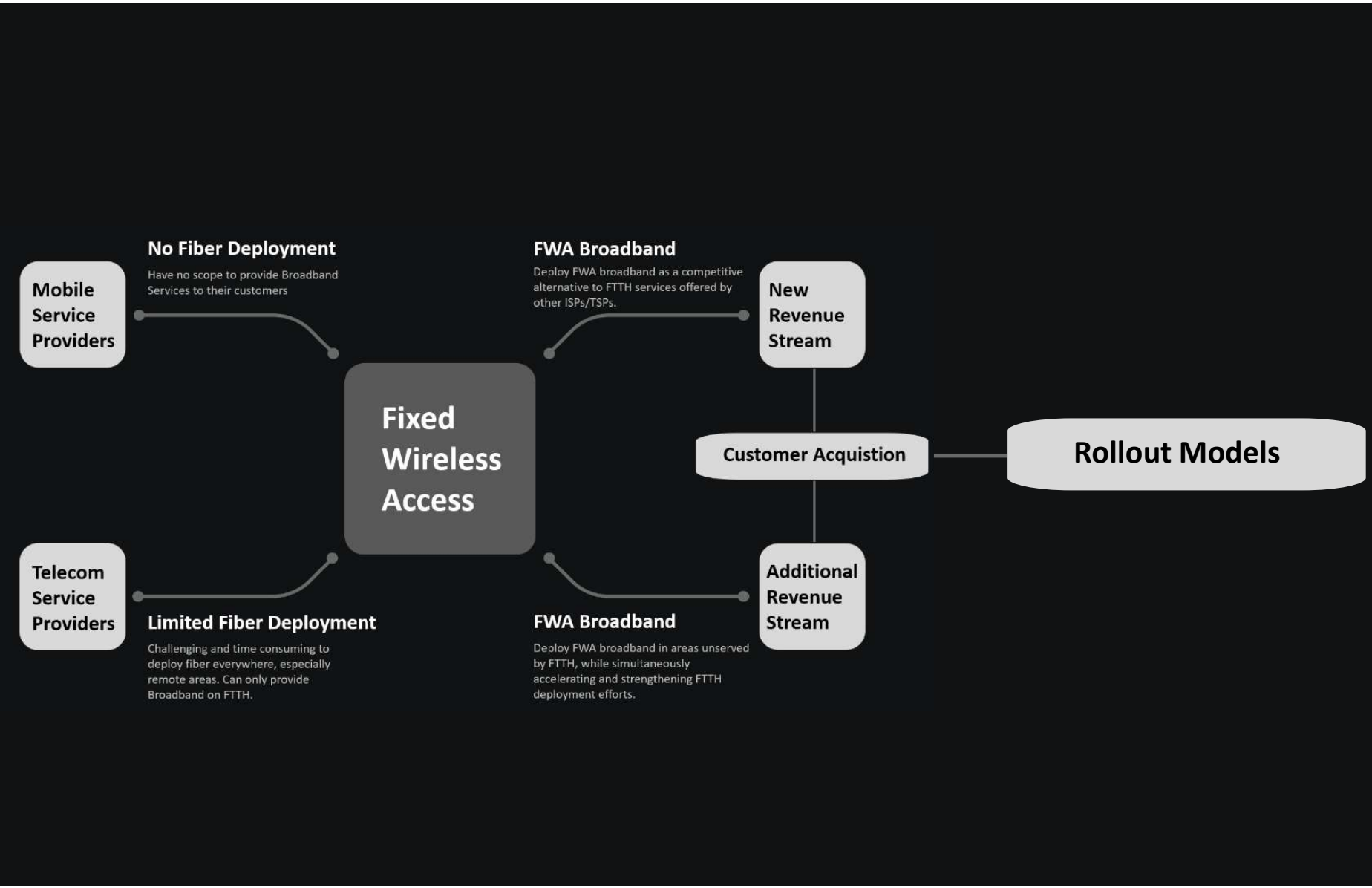
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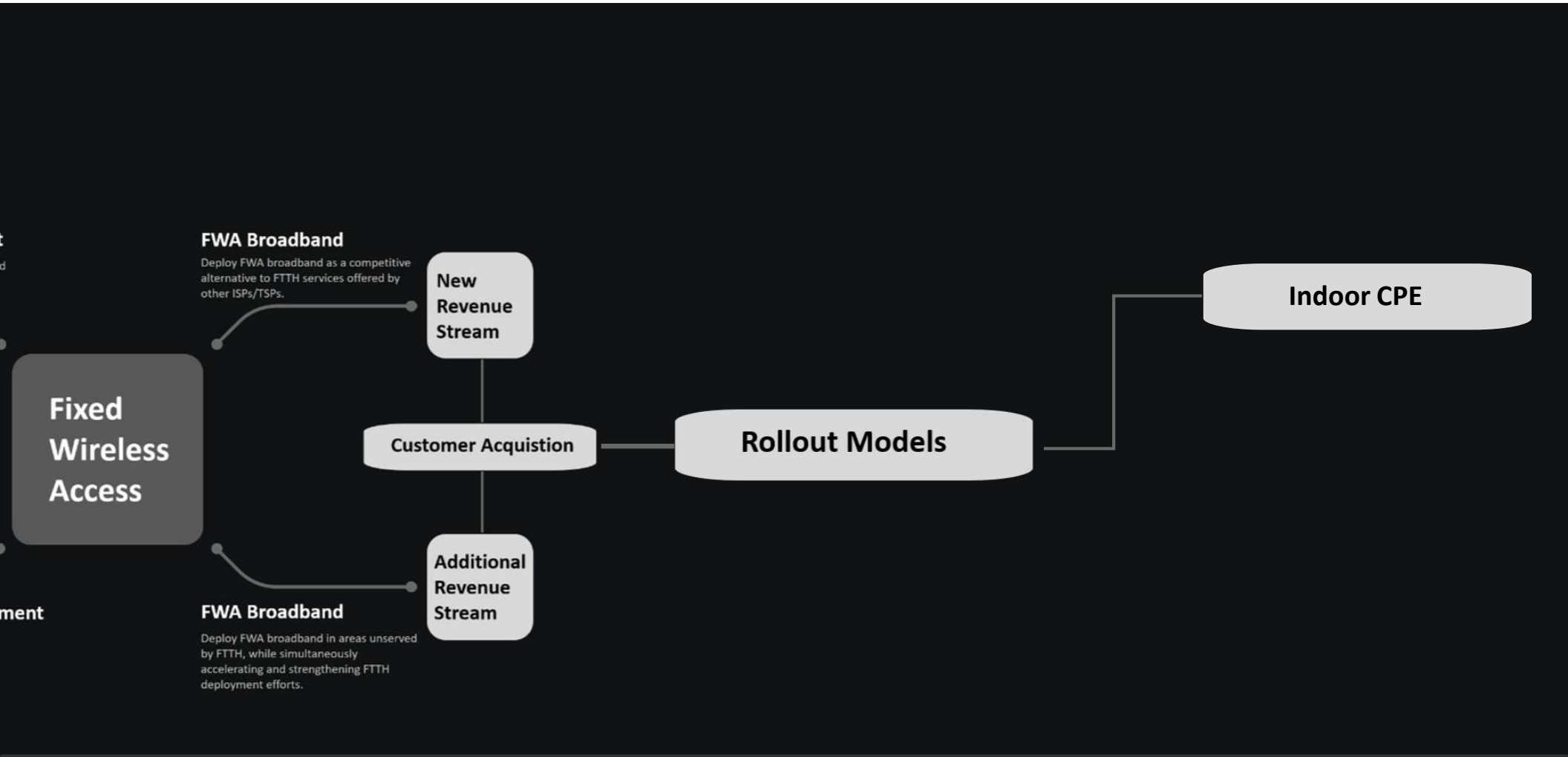
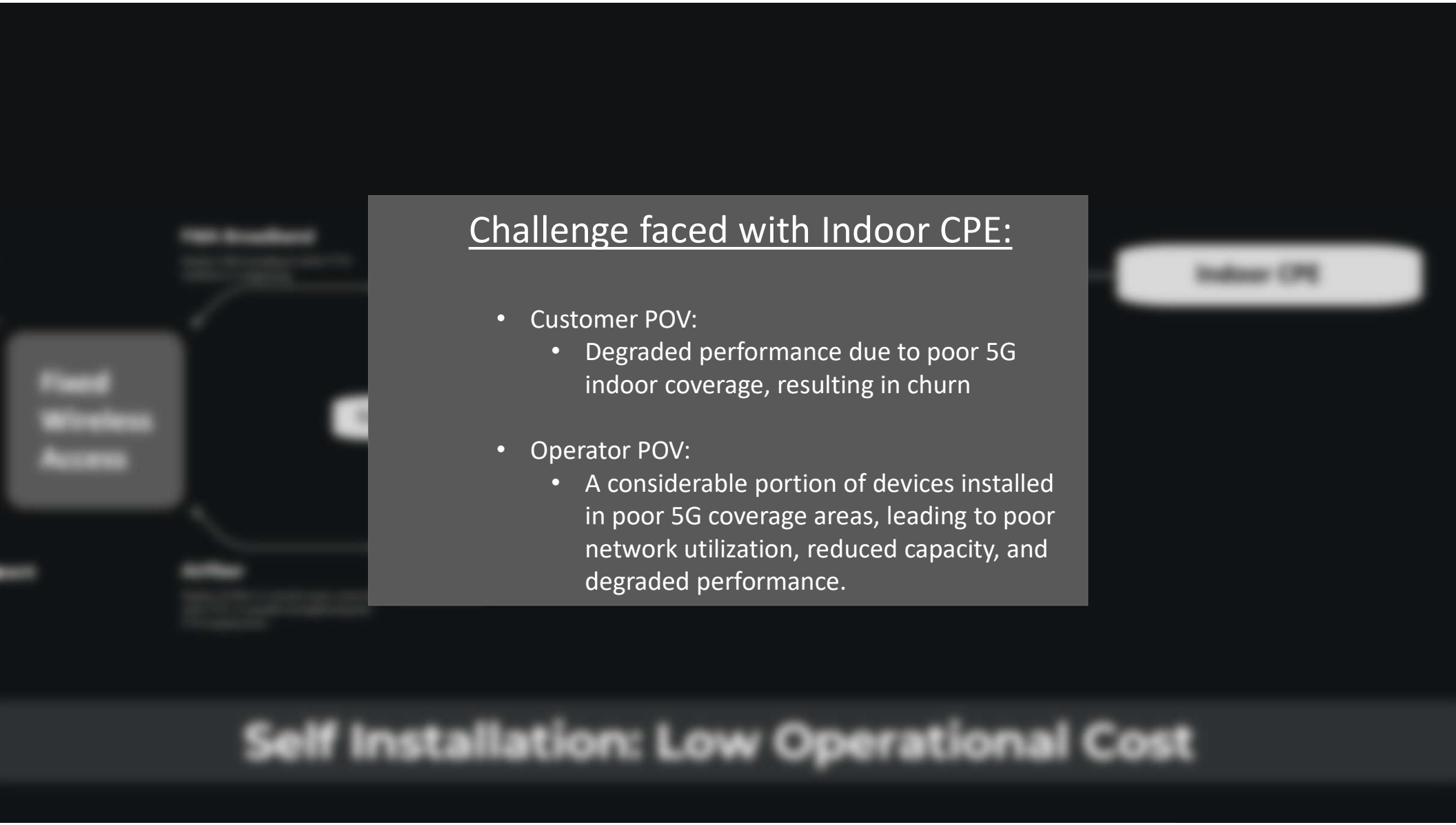
New Revenue Stream
Additional Revenue Stream
Customer Acquistion
Rollout Models

Need to cater to Challenges faced in FTTH:

- **Customer POV**:
  - Cumbersome wiring
  - Static Connection, No mobility
- **Operator POV**:
  - Limited Fiber deployment
  - High Installation Cost
  - Skilled Manpower requirement

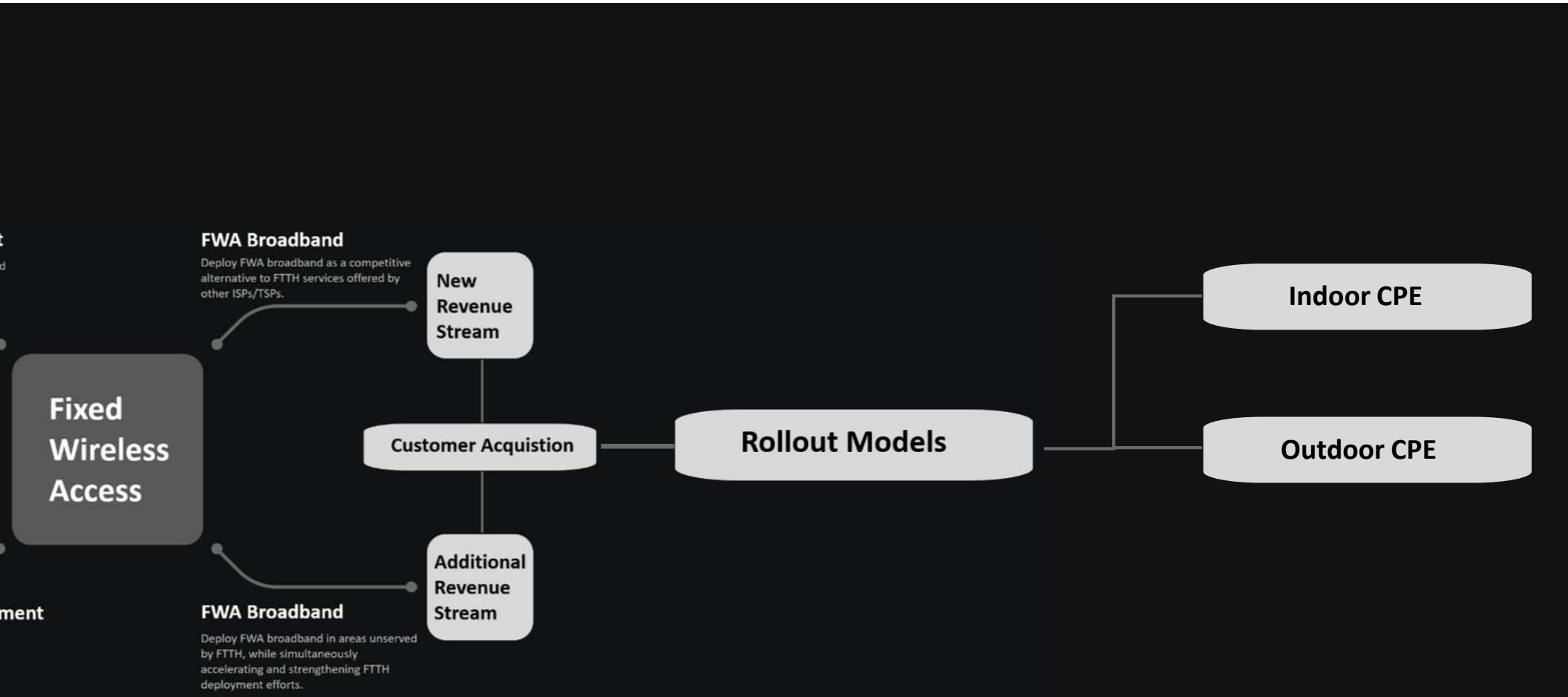


Self Installation: Low Operational Cost

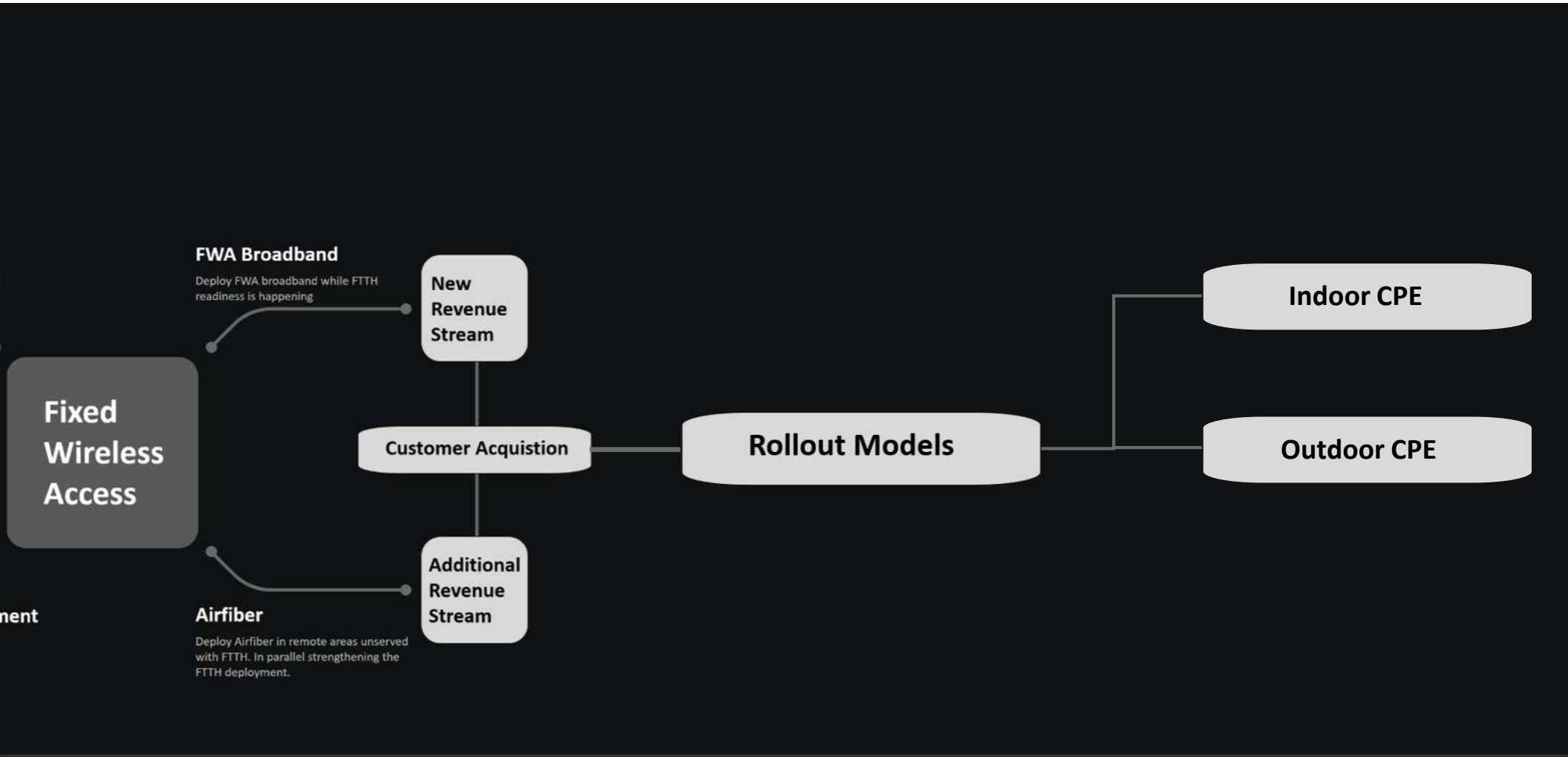


Challenge faced with Indoor CPE:

- Customer POV:
  - Degraded performance due to poor 5G indoor coverage, resulting in churn
- Operator POV:
  - A considerable portion of devices installed in poor 5G coverage areas, leading to poor network utilization, reduced capacity, and degraded performance.



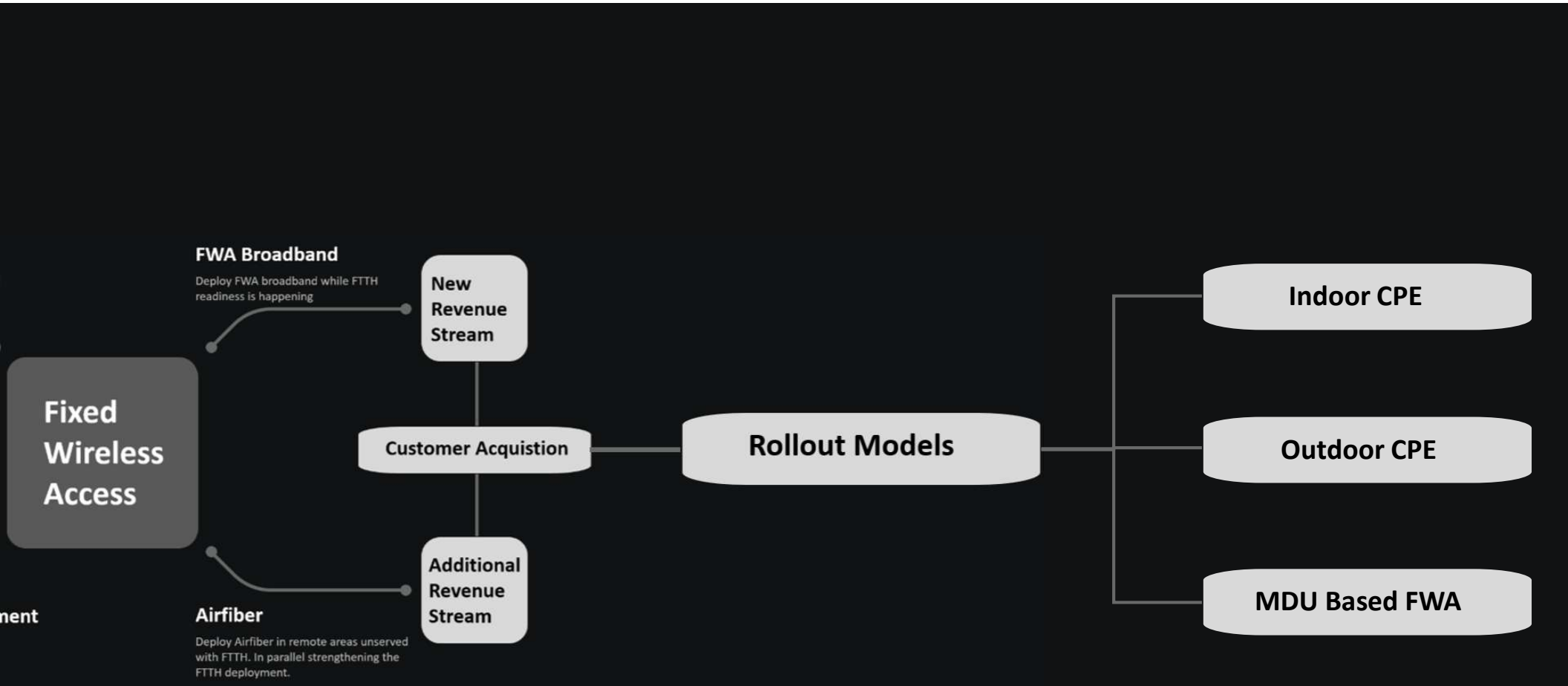
Coverage Challenge solved with Outdoor CPE



Coverage Challenge solved with Outdoor CPE

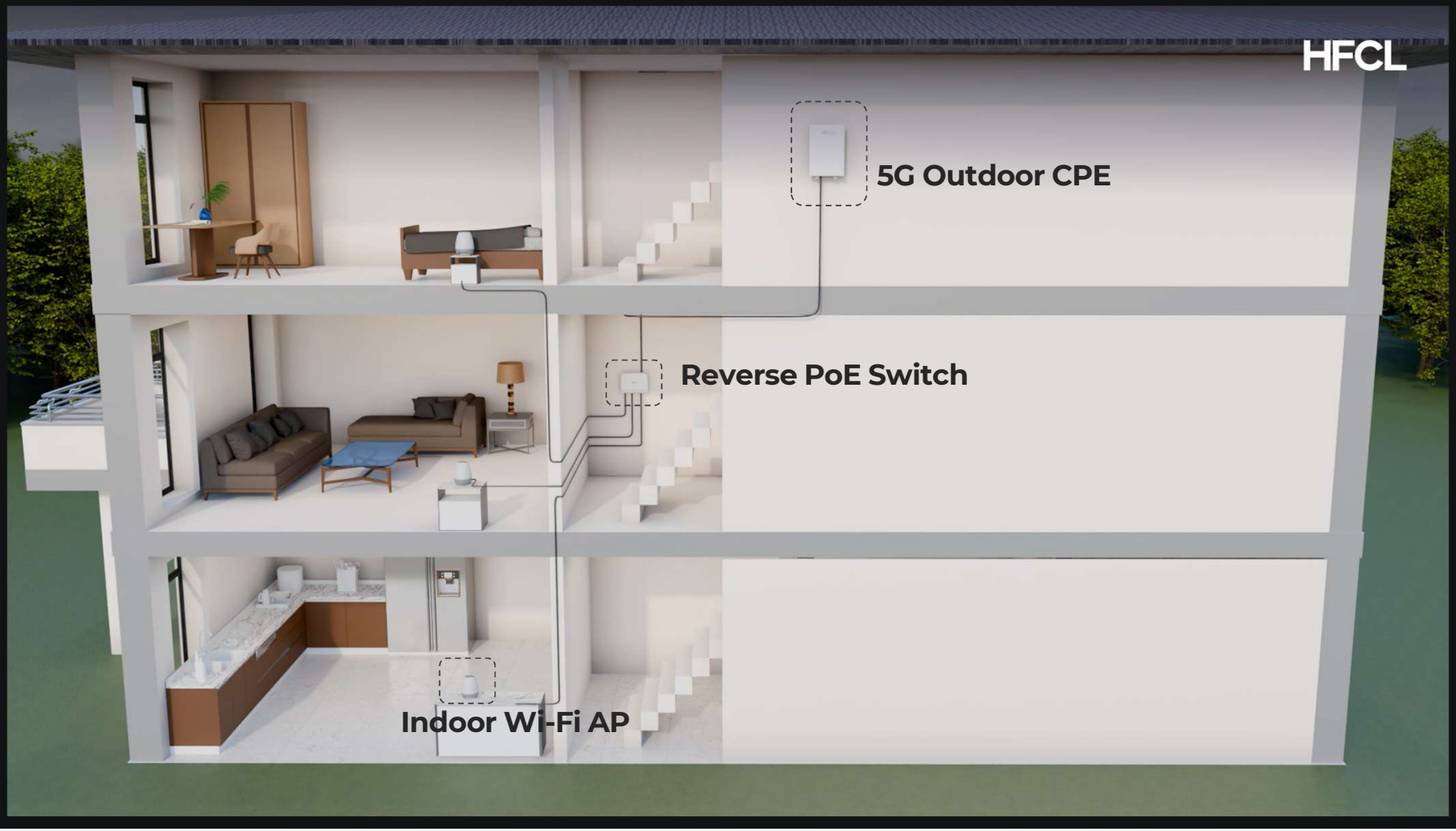
Challenge faced with Outdoor CPE:

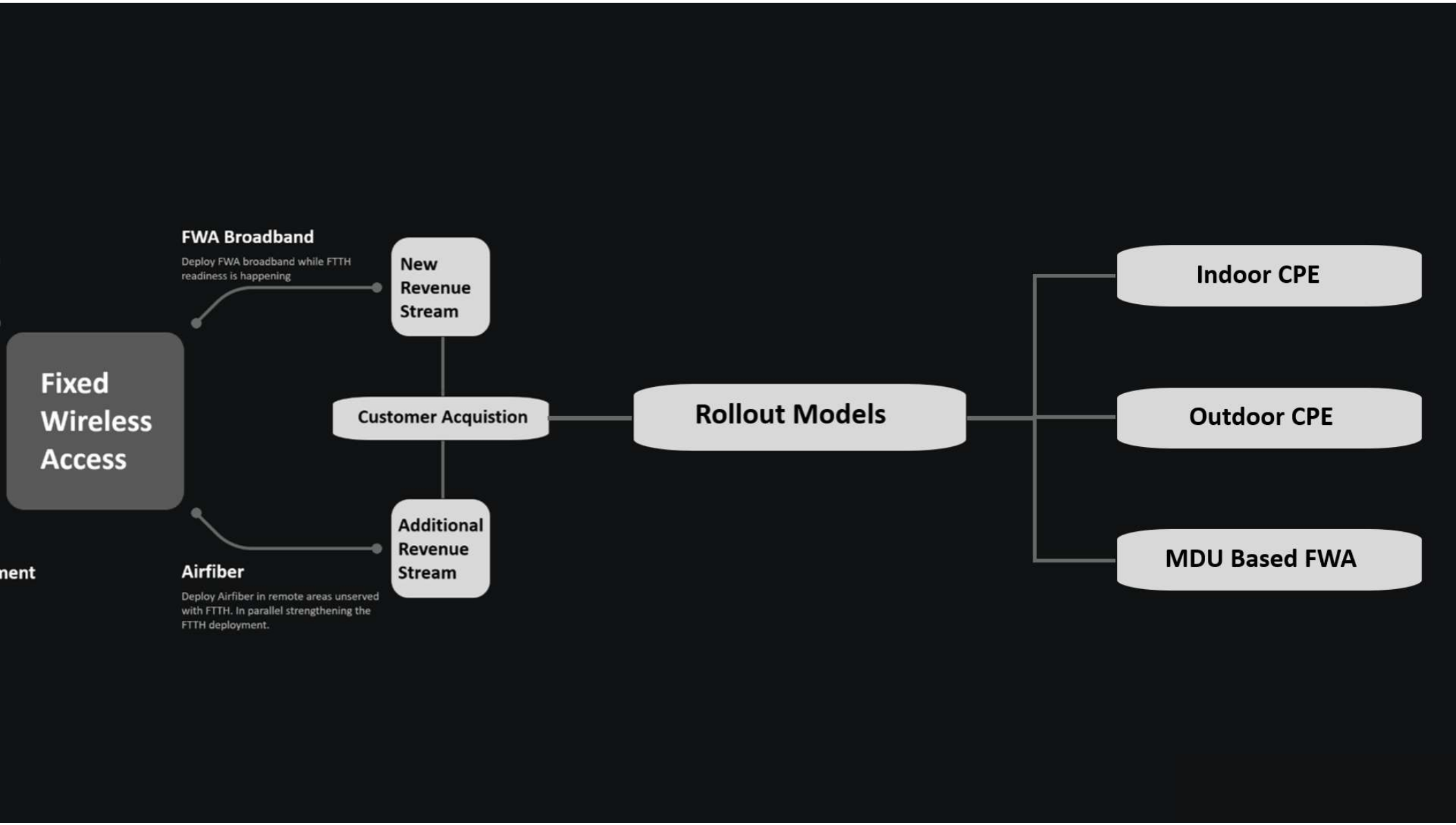
- In low ARPU markets, the Single User per CPE model proves to be cost-intensive, leading to lower ROI.

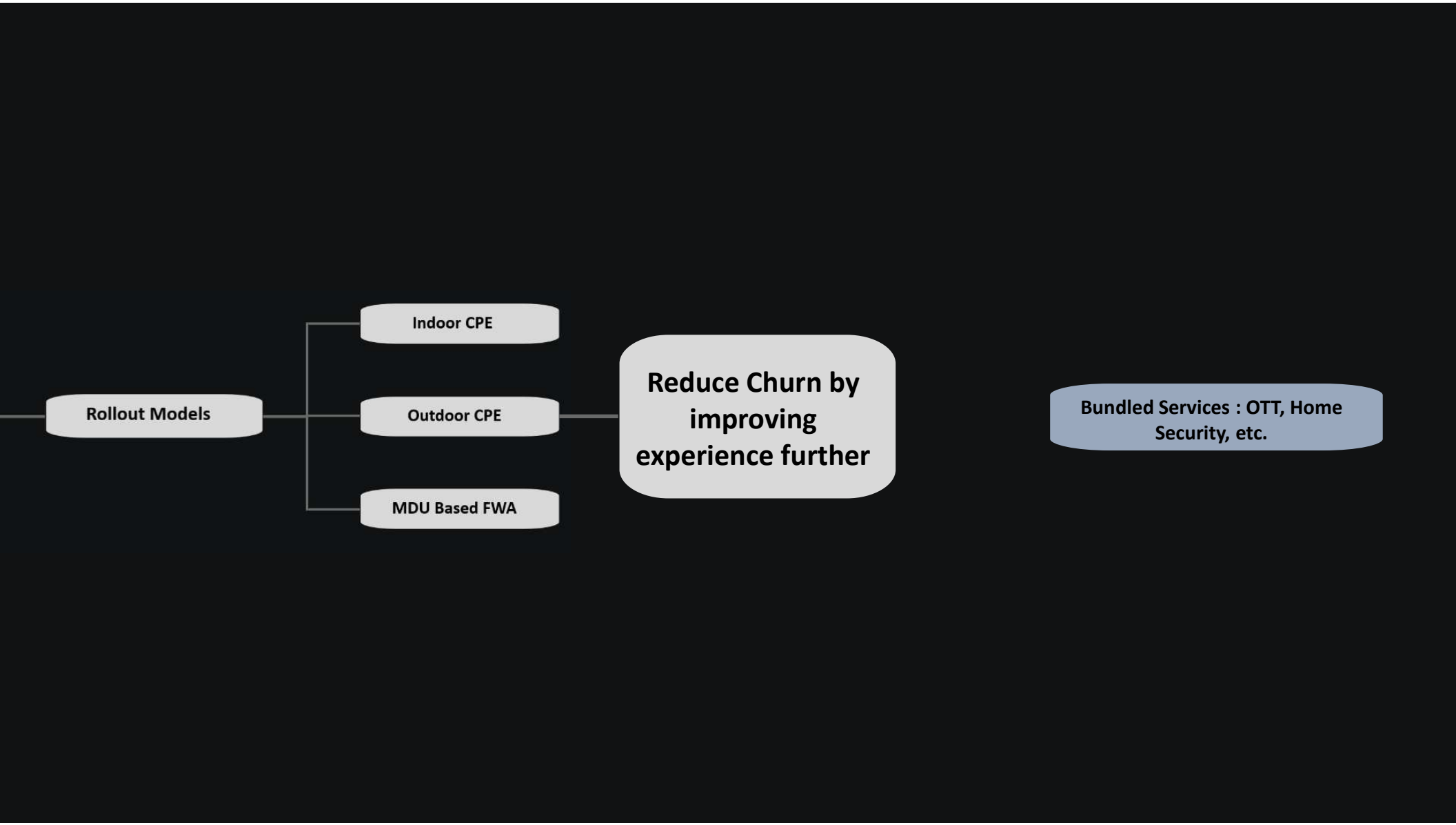


Improve ROI: Single CPE Serving Multiple Users

MDU Architecture

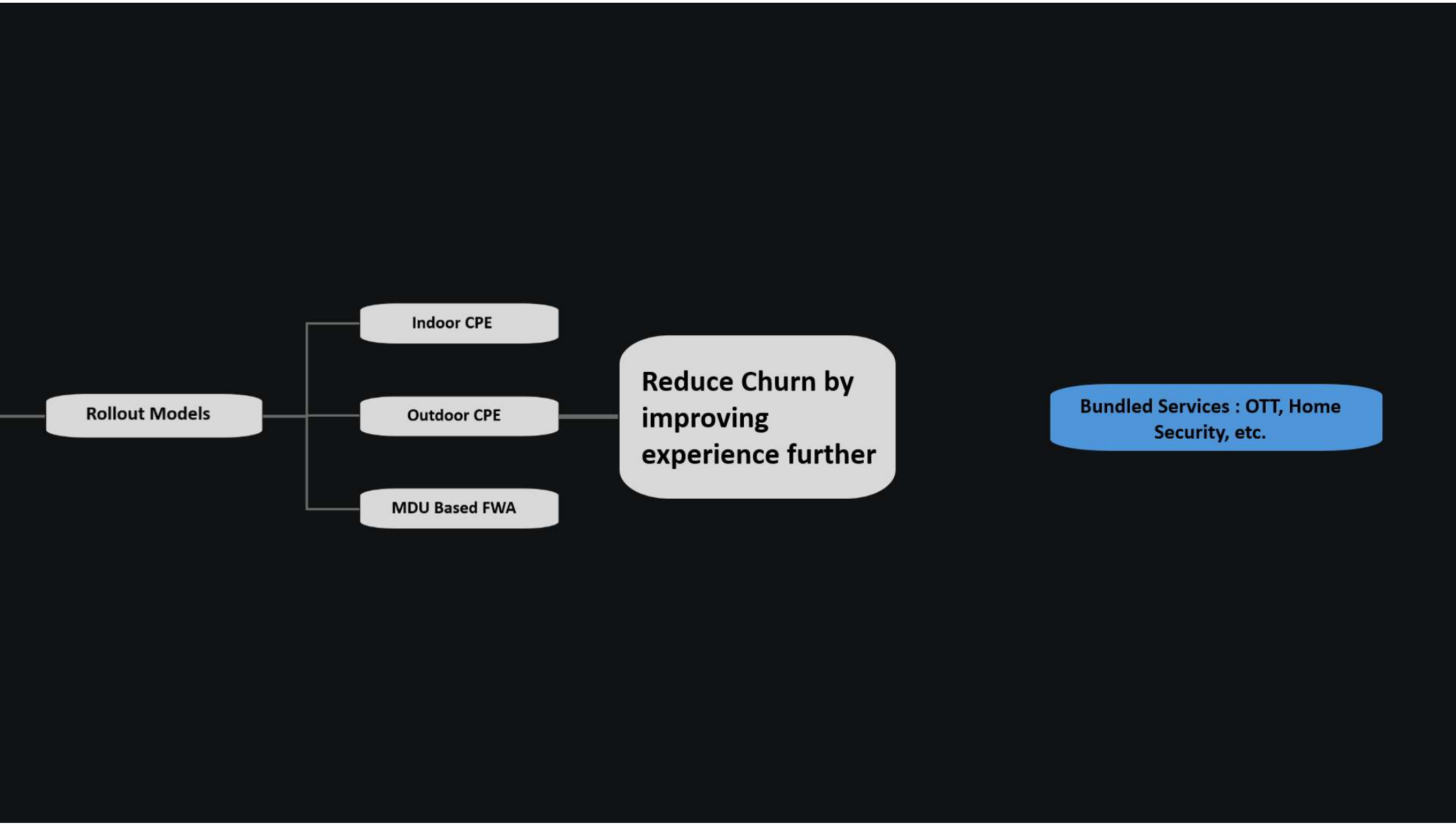



FWA Broadband
Deploy FWA broadband while FTTH readiness is happening
New Revenue Stream
Fixed Wireless Access
Customer Acquistion
Rollout Models
Indoor CPE
Outdoor CPE
MDU Based FWA
Additional Revenue Stream
Airfiber
Deploy Airfiber in remote areas unserved with FTTH. In parallel strengthening the FTTH deployment.


Rollout Models
Indoor CPE
Outdoor CPE
MDU Based FWA
Reduce Churn by improving experience further
Bundled Services : OTT, Home Security, etc.

Challenges on Sub6GHz Deployments:

- The growing mobility customer base, combined with FWA on Sub-6GHz, leads to network congestion and degraded service quality, highlighting the need for alternative solutions for FWA customer.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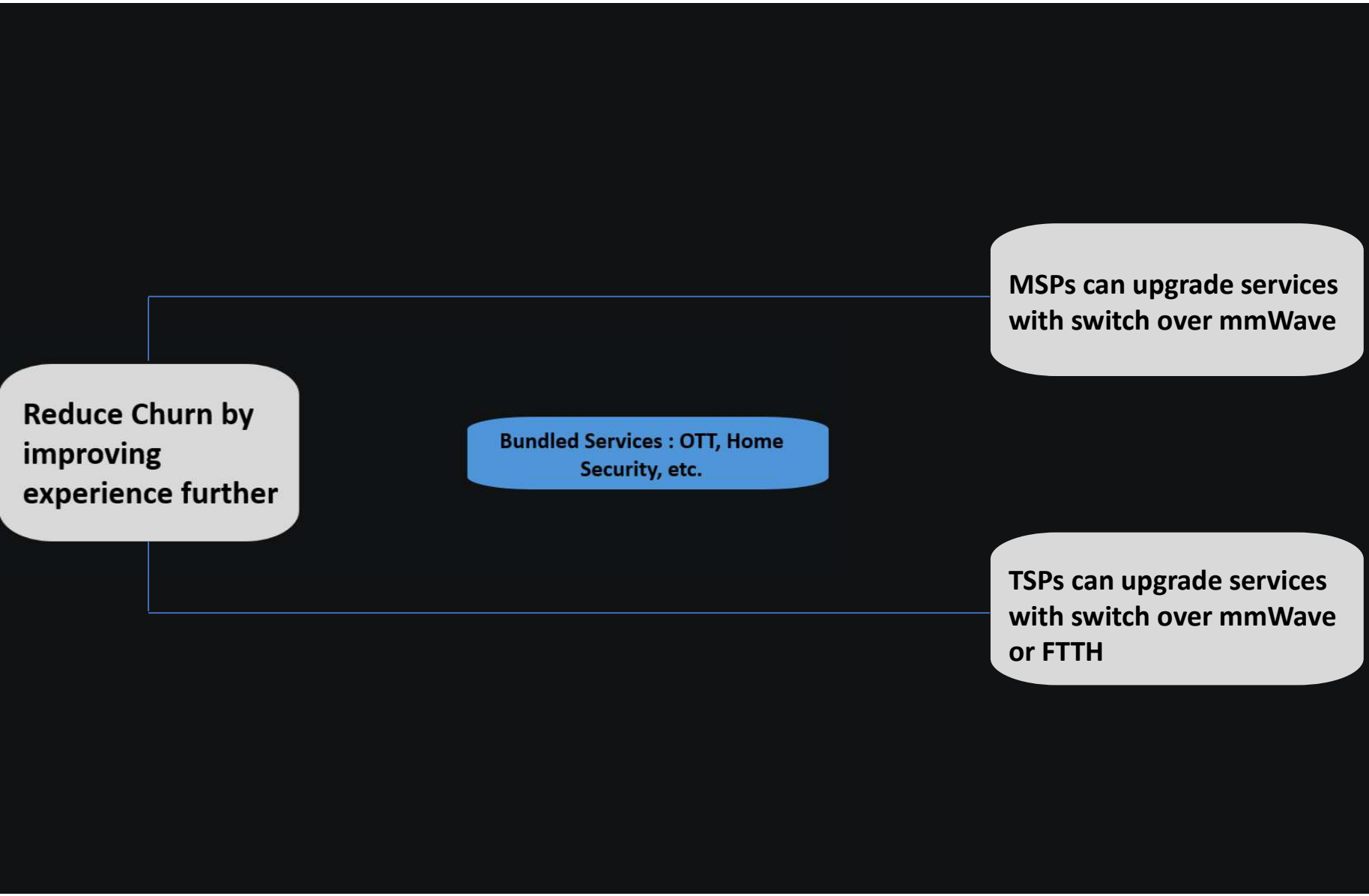
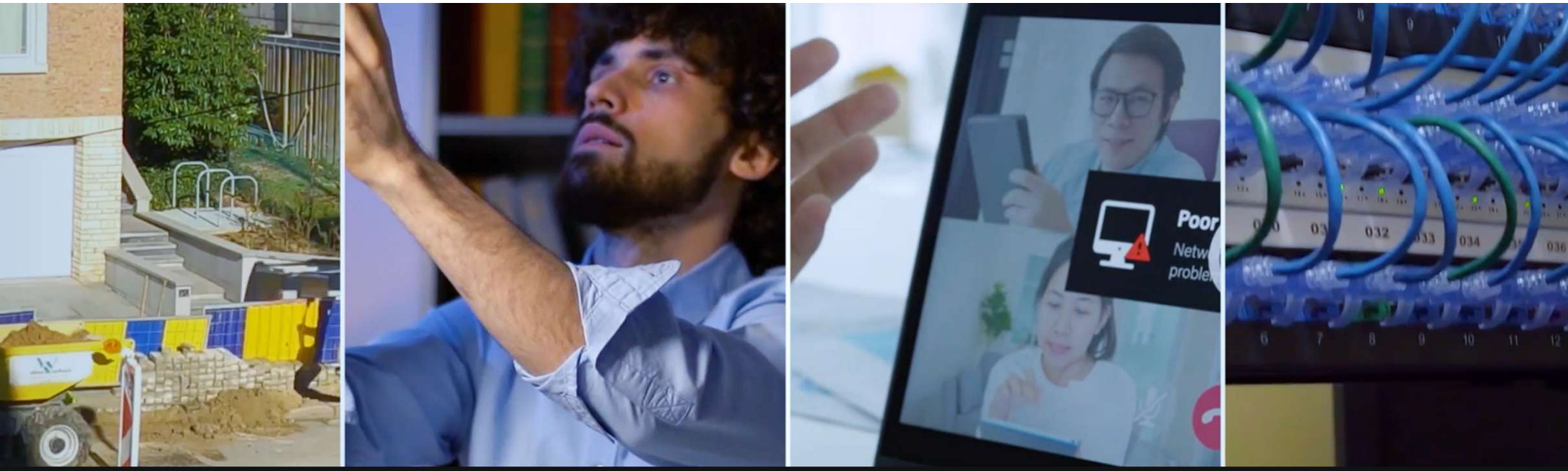

MSPs can upgrade services with switch over mmWave
Reduce Churn by improving experience further
Bundled Services : OTT, Home Security, etc.
TSPs can upgrade services with switch over mmWave or FTTH



Challenges of 5G FWA Deployment

- Installation
- Coverage
- Spectrum Exhaustion
- Cost Optimization

Challenges of 5G FWA Deployment

Installation of CPE	Coverage	Spectrum Exhaustion	Cost Optimization

HFCL's 5G FWA CPE Portfolio

Sub – 6 Outdoor CPE

High Gain Antennas
Weatherproof, water resistant

Equipped with high-gain antennas for extensive coverage and optimized network reach, even in challenging environments.

Specs:

- Sub – 6
- SA only
- IP 67

LTE + mmWave Outdoor CPE

Monetization Opportunity
More Bandwidth available

Combines the best of both worlds - LTE and mmWave technology. Delivers blazing-fast speeds and high capacity.

Specs:

- LTE + mmWave
- SA/NSA
- IP 67

Sub - 6 + mmWave Outdoor CPE

Monetization Opportunity
More Bandwidth available

Provides additional bandwidth to overcome limitations associated with sub-6 GHz frequency exhaustion.

Specs:

- Sub-6 GHz + mmWave
- SA only
- IP 67

Thank You