

Connecting Rural Communities with Mobile Broadband using LEO VSAT



VNL's Network in One Box (NiOB) based mobile broadband network can use Low Earth Orbit (LEO) satellites to provide high-speed mobile broadband internet to locations where access has been unreliable or completely unavailable. Wireless Internet Service Providers (WISP) can use VNL's solution to reach unconnected rural, remote areas & industry IoT needs, economically & profitably.

Providing internet services on VSAT is not a new concept and often used as a substitute for wireline connection in the last mile where providing connectivity on optical fibre is not viable or physically possible. VSAT has high operational expense and has a poor user experience due to high latency resulting in poor connectivity performance for video calls, online gaming, IoT decisions at the central cloud, and other data-intensive activities.

VNL NiOB based Mobile Broadband Network solutions can help Wireless Internet Service Providers extend their reach to rural areas using Low Earth Orbit (LEO) satellites as backhaul, enabling broadband services with high bandwidth and low latency in rural areas. This unique solution lets ISPs set up rural mobile broadband networks in previously unaddressable markets with viable business models.

VNL's Mobile Broadband Network for rural areas enhances connectivity powered by 4G/LTE (Long Term Evolution). It improves the economics and provides ISPs with tools to address market demands that were economically unfeasible previously.

BENEFITS

- Ideal for rural/ remote communities / remote industry IoT (<50ms latency)
- Low latency = video calls, online gaming, IoT (<50ms latency)
- High-speed data +100Mbps anywhere on Earth
- LEO will lower TCO (forecasted economy of scale)
- LTE WISP make TCO sustainable for community

HIGHLIGHTS

- Wireless internet service provider (WISP)
- Private LTE networks
- IoT over LTE for remote industries (Standalone case & local breakout)

OPPORTUNITY

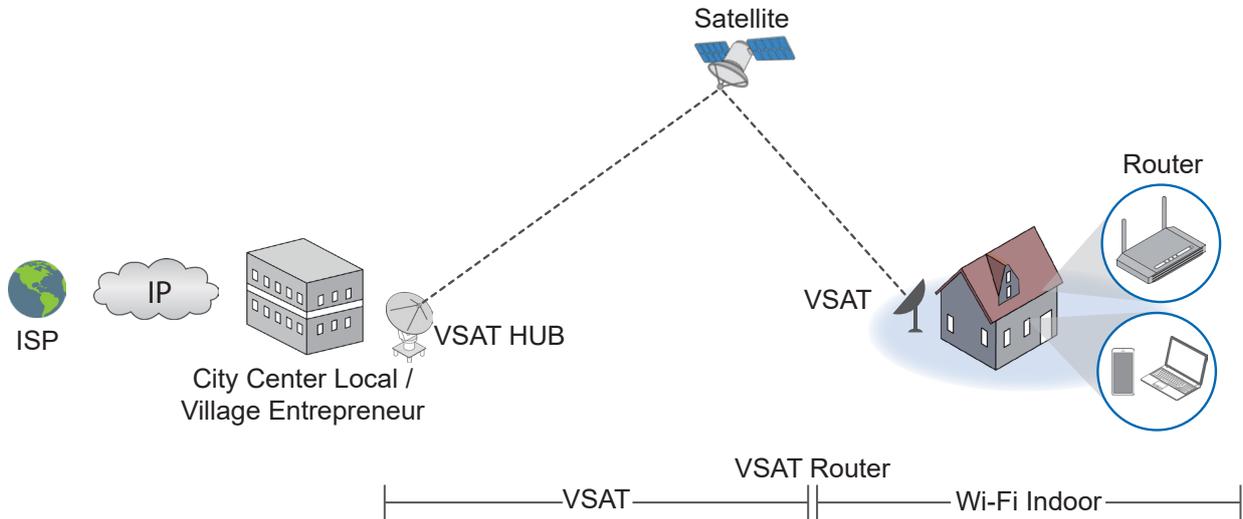
Over 40% of the world's population is still waiting for a reliable broadband access. This large number of under-served households represent a profitable WISP growth opportunity. Recent studies show these fixed investments typically have a quick payback time of less than two years.

To connect the millions of under-served rural customers and tap into a new sustainable stream of revenues.

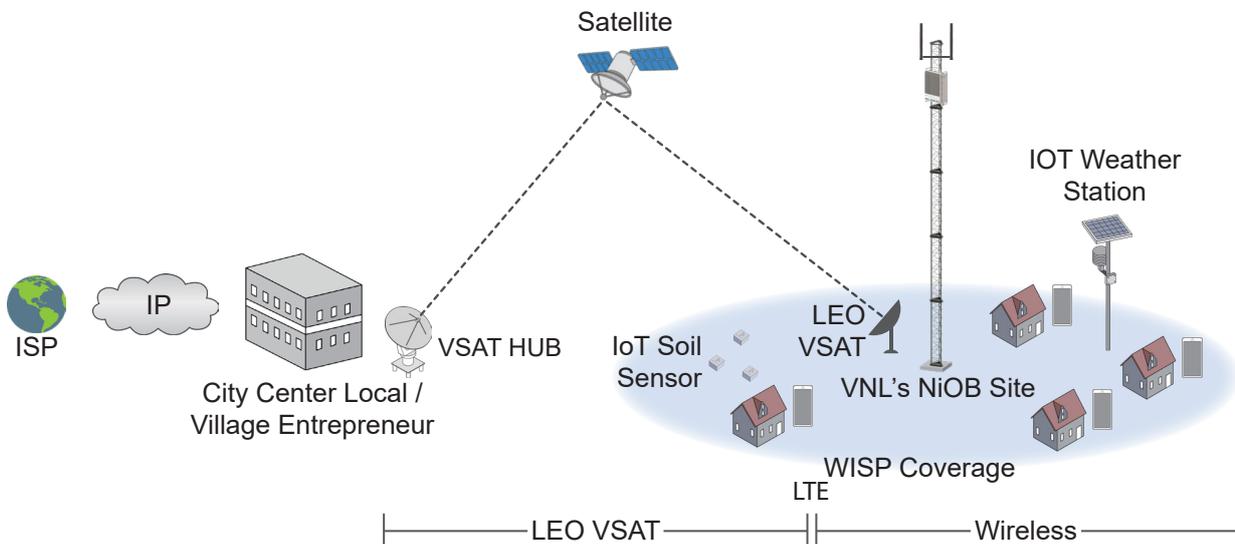
VNL's solution lets you:

1. Build a cost-effective coverage with LTE NiOB
2. Provide advanced connectivity and services to subscribers
3. Develop a profitable business case for setting up a rural telecom enterprise
4. Use LEO VSAT as a [viable] backhaul
5. Connect millions of unconnected communities around the globe, viably
6. Address non-critical IoT (Internet of Things) use cases utilising LEO VSAT's low latency (<50ms)

ISP ON LEO VSAT; COST - 100 USD / MONTH



WISP ON LEO VSAT; COST - 25 USD / MONTH / SUB



WISP to economically meet Rural market demands

***Share by 50 subs/villages**

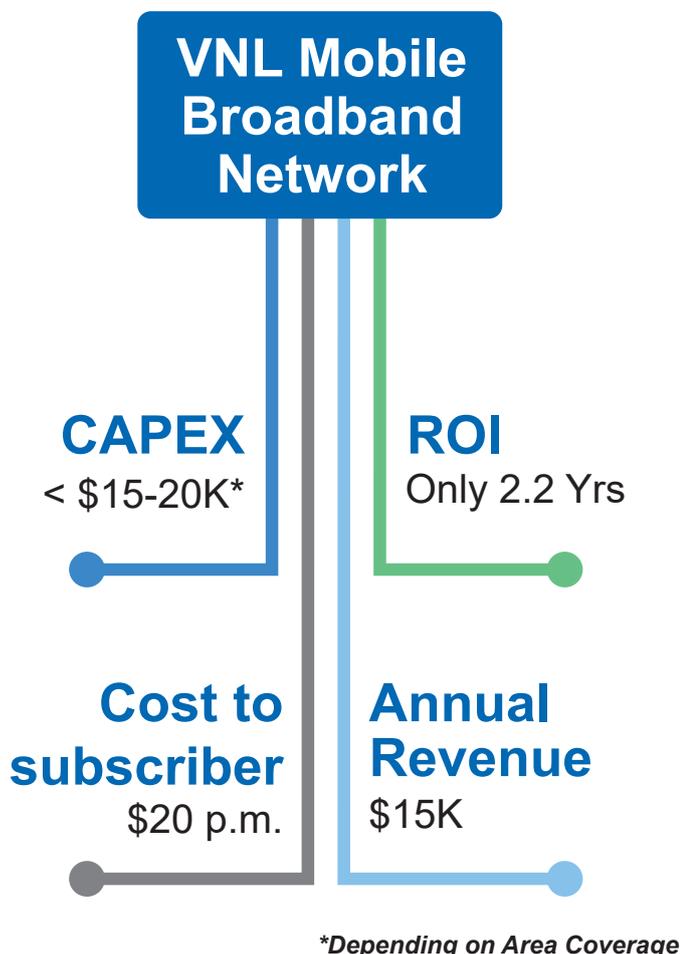
VNL MOBILE NETWORKS WITH LEO BACKHAUL – OPENING UP NEW BUSINESS MODELS

Traditional networks were never designed for the rigours of rural deployment with low ARPUs. Therefore, they are unsuited for the task and are unreliable and unviable to operate in challenging conditions if deployed. These complex and power-hungry systems require regular upkeep and maintenance by skilled technicians to add to the problem.

VNL's 4G/LTE mobile broadband system is optimised for rural areas, where accessibility and APRU are a big challenge for MNOs. VNL's easy to install and integrate Network-in-One-Box™ (NiOB) based solution reduces the CAPEX by putting all the required components of setting up and running a mobile broadband network in a single box.

This optimised system helps village entrepreneurs or communities build a low investment and profitable business to provide:

- 1. Rural mobile broadband services at the lowest possible price** to allow villagers to communicate with the world
- 2. Offer integrated Voice, Video, Data and VAS** from a single point in the village
- 3. Offer Seamless roaming** to subscribers of other mobile operators*



		LEO for Individual	VNL Advantage
1	One time Payment for Access to Broadband	\$ 999	\$ 99
2	Relative Affordability	Very Low	Very High
3	Monthly Payment for Broadband Access	\$ 99	\$ 20
4	Relative Affordability	Very Low	Very High
5	No of customers within 1 Mile radius	1	100
6	Monthly Revenue from customers	\$ 99	\$ 1,999
7	Coverage Area Radius	50 - 100 m*	1-2 km

**Assuming Wi-Fi indoor coverage only*

VNL advantage over using LEO based internet service for 1 household

With a one-time investment for setting up the tower with VNL's LTE Mobile Broadband Network system, you can be a mobile network operator and connect the unconnected village with the world. VNL's system addresses these key challenges of any rural network:

1. Integrated solution – One for all
2. Easy to install and low maintenance
3. Optimised for LEO Satellite backhaul - high bandwidth for low cost
4. Run multiple services over broadband and use numerous applications for home, schools, agriculture, police etc.
5. Cost optimised solution offering low Total Cost of Ownership (TCO)
6. Stimulate demand through skills development and literacy

VNL's solution enables a flexible business model that caters to essential mobile broadband services and allows you to expand into IoT for Agriculture services using the same infrastructure.

For further information visit our website www.vnl.in



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CONCLUSION

VNL's mobile broadband network with LEO VSAT systems can enable attractive new business opportunities for rural entrepreneurs:

1. Wireless internet service provider (WISP)
2. Private LTE networks
3. IoT over LTE for Agriculture, Minings & Remote industries (Standalone case & local breakout)

Using VNL's carrier-grade, flexible and cost-optimized small cell solutions and integrated NiOB products, you can open new market verticals and disrupt the value chain.

With the right partnerships (of satellite, Local communities, mobile and operator Government, stakeholders), integration of best of breed products and combined way to market, there is some good business which can be done.

The VNL's product line, combined with roadmap and market vision, is the perfect match to LEO VSAT networks for providing cost-effective remote access and enabling new market verticals.

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