

# How can you make a **happy nation happier?**

Talking is sharing. And sharing increases happiness.  
VNL is helping connect the unconnected in Bhutan  
through its rural and remote wireless mobile solutions.



Do the Bhutanese want isolation or connectivity? How can mobile communication reach places that are difficult to reach?

VNL is helping TashiCell find answers by connecting people in rural Bhutan with the rest of the world, making the Happy Kingdom an even happier place.

## Summary

With 87% penetration, Bhutan has a fairly healthy mobile connectivity scenario. However, there are still many rural and remote areas of the Happy Kingdom where there is little or no access.

These areas are characterized by difficult terrain, inadequate road infrastructure and sparse population. In such conditions, it did not make commercial sense for Tashi InfoComm Limited (operating under the TashiCell brand name), the first private mobile operator of Bhutan, to invest in high-outlay, capital-intensive mobile towers and equipment to reach small subscriber bases. Nor was it feasible to fall back on diesel as a power backup fuel, given Bhutan's emphasis on environment-protection.

TashiCell therefore settled for a completely sustainable, low-CAPEX and near-zero-OPEX WorldGSM™ solution from VNL. Working against all odds, going where there are no roads, VNL has provided the equipment, know how and training to install, erect and upgrade mobile communication towers at 13 TashiCell sites across rural Bhutan.

Talking is sharing. And sharing increases happiness. Today, it is difficult to imagine how life in these difficult areas would be without this solution.

## The Problem

Even as Bhutan opens up to the world, one of the biggest challenges has been to connect its hinterland. Daunting terrain and sparse population have always hindered infrastructural development in the interiors of the Happy Kingdom.

Deploying a traditional mobile network in such areas is full of obstacles. Radio Frequency planning is extremely difficult in the mountains, for one. Then, there is hardly any justification for the capital and recurring expenditure demanded by traditional towers and equipment. And grid power is unavailable because power lines haven't reached these inaccessible locations.

Specifically, TashiCell believed that deploying a traditional network in the mountains was unviable because

- a. The footprint, size, and civil-works requirements of large traditional towers and equipment were impractical and the costs unaffordable.
- b. Using diesel as a back up power fuel was not only infeasible given the associated supply, transport, storage, pilferage and wastage nightmares, but also inadvisable given Bhutan's emphasis on preserving its environment.





# Impact

20

CONNECTED VILLAGES

2,000

CONNECTED CITIZENS

Solar

POWERED SITES

10,800

CALL MINUTES PER DAY



## The Solution

In VNL's WorldGSM™, TashiCell found a solution that could reach remote mountain locations, be installed rapidly using local resources and run on alternative energy without compromising on services.

WorldGSM™ reduces the capital cost per subscriber while slashing network operating expenses. It is the least expensive, fully functional wireless solution that combines cellular switching and base station controller functionality. It represents a substantial paradigm shift in mobile network architecture by enabling the migration of highly centralized cellular, PCS and WLL networks to a distributed architecture. This places coverage and capacity where it is needed, quickly, affordably, and with minimal OPEX and CAPEX. VNL's WorldGSM™ pushes the intelligence from the center out to the spokes, creating a distributed network. Multiple WorldGSM™ units can be networked to each other or to an existing cellular switch. By eliminating or reducing the importance of a centralized switch, an operator can lower capital costs and backhaul expenses.

TashiCell identified 13 rural locations where there was no mobile connectivity. These include Damchethang, Dranglatop, Ugyencholing, Kuengarabten, Nangsigoenpa, Yutongla, Thrinsingla, Gayzor, Baynangbedang, Sukuni, Phuntshorabtenling, Deorali and Bangstar. Today, each of these sites has low-powered base-stations beaming GSM voice and data signals within a radius of 5 - 7 km and are networked with the nearest TashiCell exchanges. Wireless backhaul access and subscriber management is provided by TashiCell.

## Technical Details

VNL BSS is integrated to Core Network nodes MSC (Huawei Hardware MsoftX3000 OSTA1.0 Software Release V100R007) and SGSN (Huawei Hardware 9810 OSTA 1.0 and Software release V8R9) in TashiCell, Bhutan. VNL has demonstrated to the TashiCell team, all essential GSM functionalities like good quality voice calls, SMS and GPRS data transfer. A interface is over E1 and Gb interface and Abis interface are over IP. The BSC is integrated with VNL's 10W-2TRX (RBTS), and 2W-2TRX (VBTS).



**"Low cost equipment like that supplied by VNL makes sense for very small villages with a population of 100-200 people."**

Tashi Tshering, Managing Director,  
Tashi InfoComm Ltd.



**"I can now talk to my parents, and when I have extra produce, I can call Thimphu to sell my vegetables."**

Januka Chauhan,  
Shop owner & Farmer, Deorali



**"I use my mobile to do research for my project and explore new ideas."**

Damcho Tshering, Student, Nangsigoenpa

# About VNL



VNL makes the award-winning WorldGSM™ system, a sustainable, turnkey GSM and broadband solution specifically for rural and remote locations. It also makes a range of privately owned and managed GSM & broadband network solutions for specialized applications such as secure communication platforms for homeland security, communications for remote industrial centres and rapidly deployable networks for disaster and emergency situations.

VNL's pioneering work has been widely praised. During Mobile World Congress, 2010, in Barcelona, VNL was the recipient of GSMA's 2010 'Green Mobile - Best Green Programme Product or Initiative' Award. VNL was also named a 'Technology Pioneer 2010' by The World Economic Forum. In addition, VNL was named the third most innovative company, and the most innovative telecom company in the world, in the Wall Street Journal's annual Technology Innovation Awards in 2009.

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#ChangingLives