

# CRI

## Connecting Remote Islands



### GSM & Broadband Networks for Indonesia

**T**housands of small, remote islands are in urgent need of affordable telecommunication services. These islands have little population, no/unreliable electrical grids, huge infrastructure bottlenecks and low levels of income. VNL's WorldGSM™ solution helps deliver affordable mobile and broadband connectivity to connect such remote locations with the rest of the world.

**T**housands of small, remote Indonesian islands are in urgent need of affordable telecommunication services. These are islands with small population, no electrical grid (or an unreliable one), huge infrastructure bottlenecks, and low levels of income. VNL's WorldGSM™ solution can deliver affordable mobile and broadband connectivity to millions of Indonesians and connect them to the capital Jakarta and the rest of the world.

## INTRODUCTION

One out of every nine people in Indonesia is an islander.

150 million Indonesians live their lives on approximately 17,000 inhabited islands. Thousands of these islands have a population of less than 1000 inhabitants. These islands are not covered by mobile and broadband services. Also, the inhabitants have low income.

Small islands have characteristics that make them especially challenging when building out telecom infrastructure. These characteristics include their limited size, geographical dislocation, proneness to natural hazards, limited existing infrastructure with non-existent or unreliable electrical grid and low income level.

What little telecommunications capability an island may have today comes with a high price tag of connectivity via satellite.

Most people living on islands tend to call other inhabitants of their island or others on nearby islands. The cost to connect via satellite is exorbitant to a local fisherman, farmer or weaver. But the advantage of having a phone could dramatically change an Indonesian's life.

A fisherman, returning from a day at sea, could call ahead and learn who is buying at a higher price and go directly to the harbor of choice. A doctor on a nearby island could call to check on a patient, instead of making a trip across the water. The uses for telecom are manifold.

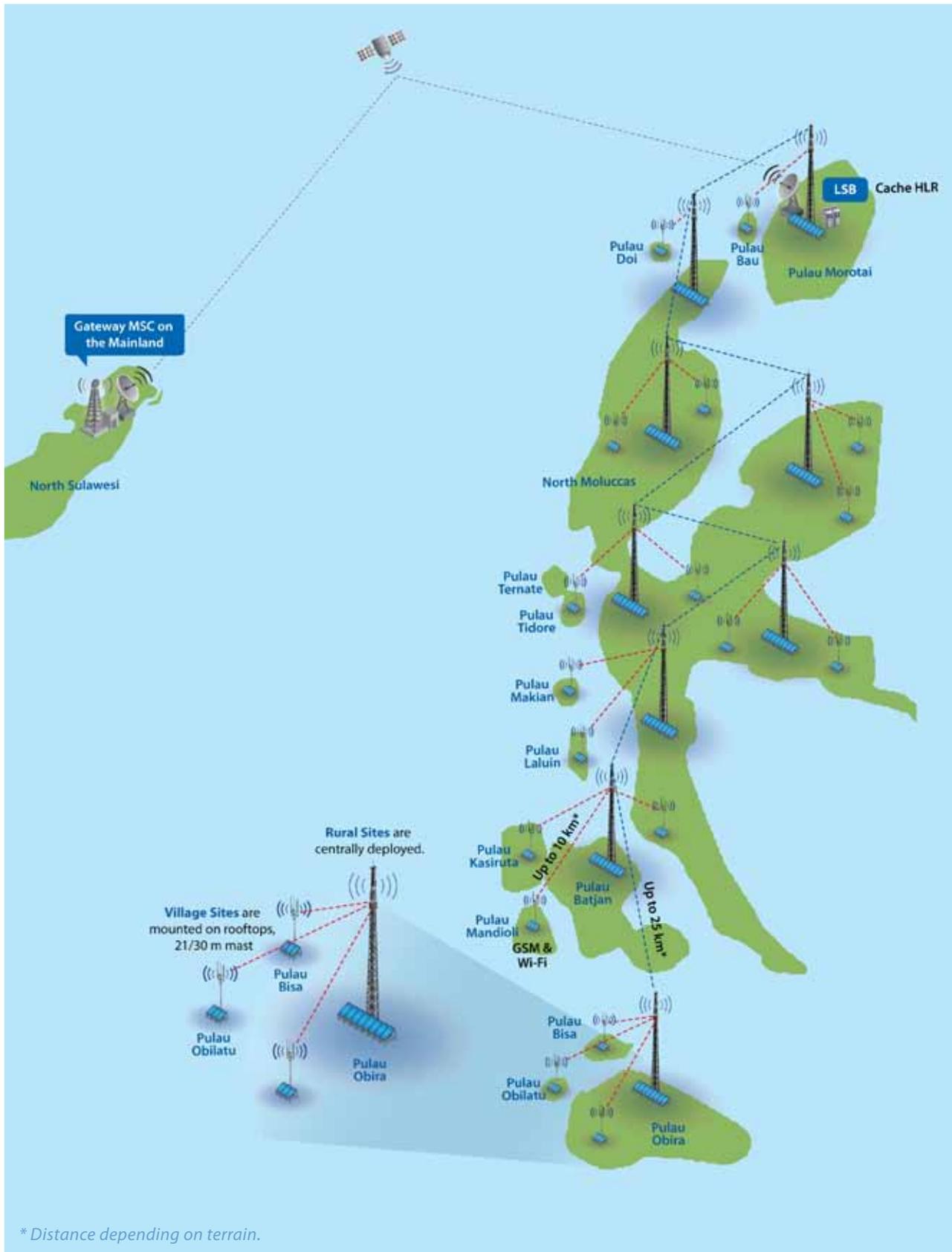
## THE CHALLENGE

VNL understands the significant challenges faced by mobile operators in deploying wireless network solutions on islands where electrical grids are non-existent or unreliable, road access is frequently difficult and diesel fuel is expensive.

Power costs are typically the highest percentage of the operators' operating expenses, especially on remote islands. In the absence of a reliable electrical grid, most telecom equipment located on islands are powered by diesel generators. Diesel is expensive to purchase, difficult to transport, expensive to store, and is subject to pilferage.

ARPUs are so low that the operators can't justify traditional GSM deployment strategies. This is another significant reason why remote islands are especially unconnected – these areas lack even basic telephony and data services.





**WorldGSM™ Cascading Star Architecture and local switching capabilities enable local calls to be routed within the local system without connecting back to a satellite or host network.**

Remote island communities also lack technical manpower. A truly island-optimized base station has to be assembled by non-professionals – often people who cannot even read or write.

All these factors make the traditional GSM system deployment simply too expensive and complex to provide an acceptable and profitable business case to the operator.

### WorldGSM™ SOLUTION: EXTENDING EXISTING GSM NETWORKS

VNL's solar powered WorldGSM™ rural network solution is ideal for remote islands. It provides GSM and Broadband through the Cascading Star Architecture that places coverage and capacity where it is needed, quickly, affordably, and with near zero OPEX and low CAPEX.

The VNL WorldGSM™ Cascading Star Architecture features an incremental rollout solution. The key elements in a WorldGSM™ network are the Rural and Village BTSs (RBTS and VBTS). Several BTSs can be connected in a chain to provide continuous coverage.

Rural Sites are deployed in any rural location. WorldGSM™ Village Sites are mounted on rooftops or on flat ground within the operating radius of a Rural Site. These “stars” extend the reach from any existing GSM network node. It's fast, simple and it drives CAPEX and OPEX to new lows.

Islands benefit through Local Switching – WorldGSM™ uses the distributed architecture that enables local calls between islands to be routed within the local system instead of sending them back to a switch on the mainland. This requires no connectivity to satellite or undersea cable, thus bringing costs down significantly.

WorldGSM™ by design has very low power consumption and maintenance cost. A WorldGSM™ rooftop Village Site packs into few small crates and is designed for easy assembly and installation by local workers. VNL provides a tailored implementation plan that addresses the affordability issues, traffic demand and coverage areas. In addition, the problem of

transport under difficult conditions, the lack of reliable electrical grid, the lack of basic telecom engineering skills and security issues have been resolved.

### CONNECTING THE NEXT BILLION

WorldGSM™ provides an easy entry for mobile operators in Indonesia who want to expand their networks, connecting remote islands to the rest of the world. It enables low-cost expansion as uptake increases. Small, easy-to-assemble components contribute positively to the cost, power savings and sustainability of the WorldGSM™ system.

For the first time, the telecom industry has an affordable and sustainable solution for the millions of island inhabitants of Indonesia who are still without voice and data access.



*Conspicuously absent from WorldGSM™ deployments are such things as buildings, air-conditioning, grid power, generators, diesel fuel and armies of expensive engineers.*

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