

# DISTRIBUTED LONG-RANGE ANTENNA SYSTEM (dL-RAS) SOLUTION



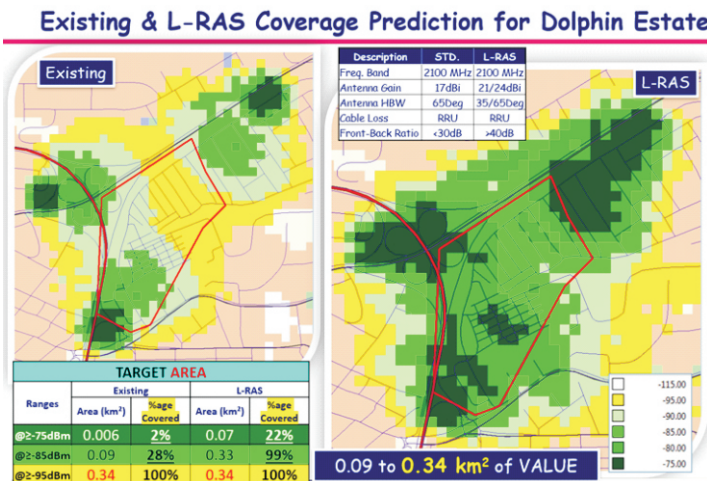
**Figure 1:** Dolphin Estate & Extension (DEX) described as the target “Area of Interest” (AOI)

This note is on the application of **TYDACOMM** dL-RAS solution to Dolphin Estate & Extension (DEX), a large and dense Urban Residential Area in the heart of Lagos Island.

At the North-western end of DEX, is the Dolphin Extension, which is comprised of multiple rows of three-storey, thick concrete, prefabricated buildings, depicted in *Figure 1*. There had been severe complaints from residents about little or no 3G coverage, hence, poor and unreliable data services. To the Operator, having such poor customer experience in an area with High Net-Worth Individuals (HNI) and huge revenue potential was totally undesirable and unacceptable. Furthermore, there were lots of churning resulting in significant revenue losses. A solution must be sought!

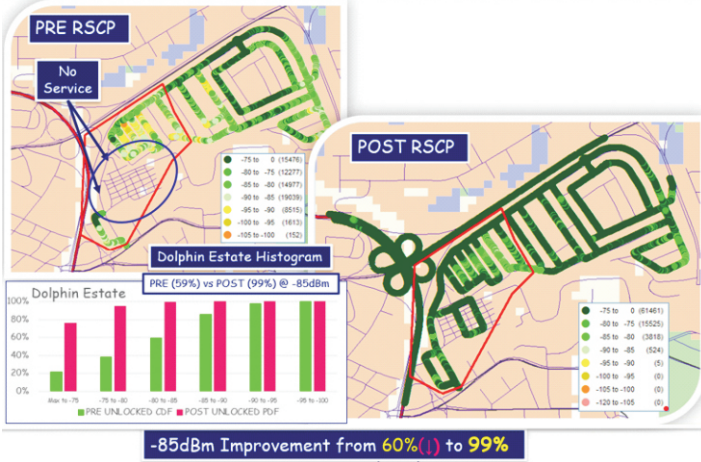
To remedy the situation, the Operator would have to install a new site within DEX. However, no space was available, nor would the Residents Association allow a new site to be built. **TYDACOMM** was approached at this point by the Operator to explore if a 3G-solution at 2100MHz band utilizing our proprietary distributed Long-Range Antenna System (dL-RAS) could be deployed.

The Design and Implementation due diligence conducted by **TYDACOMM** Engineering & Deployment Teams yielded the Solution depicted in *Figure 2*, which is a far cry from the existing scenario. In summary, it comprises of the deployment of distributed High Gain, Long Range Antenna Systems to replace the existing standard antenna panels at three strategically selected triangular existing Sites (one sector per site only), providing optimized and acceptable Coverage signal in the desired area.



**Figure 2:** Predicted Existing vs. dL-RAS Antennas Coverage Plot of the Received Signal Code Power (RSCP)

### PRE & POST Drive Test: 3G-2100MHz (Idle)

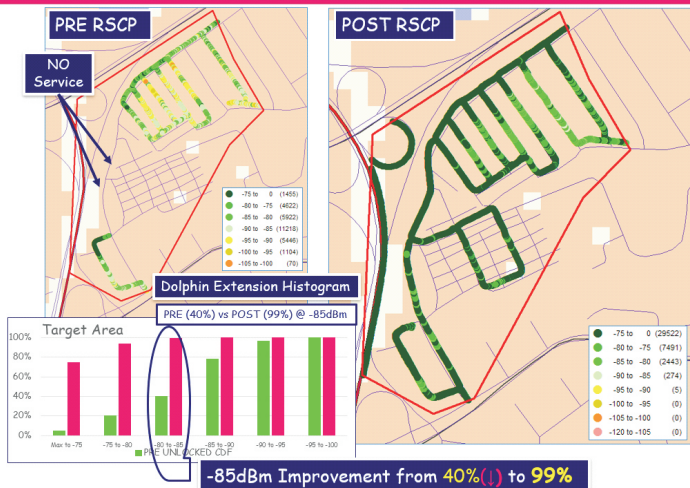


**Figure 3:** Pre. Vs. Post actual drive test result with improvement in coverage area from 60% to 99% at -85dBm RSCP level.

Part of the design and deployment exercise is a thorough understanding of the pre-existing coverage Received Signal Code Power (RSCP) footprint. Against this, **TYDACOMM** dL-RAS solution is measured. The resulting metrics are depicted in *Figures 3 & 4*, representing the Before & After actual drive test results, respectively described as “Pre-RSCP” & “Post-RSCP”.

The signal levels (RSCP) improved dramatically across the Estate (DEX) and, the entire defined area of interest (AOI) in particular. The RSCP Coverage area at -85dBm across the Estate increased from 60% to 99%. The improvement is much more dramatic when the focus is on the AOI, where, it went up from 40% to 99%. A look at the plotted histogram or the cumulative distribution function (CDF) of Pre- vs. Post-RSCP at stronger signal levels (better than -75dBm) is even more pronounced. While these are outdoor and street-level measurements, they also represent indoor measurements by the nature of the Estate. The measured (greater than 60% delta) and reported data throughout by Residents and hence, the cell utilization improved significantly.

### PRE & POST Drive Test: 3G-2100MHz (Idle)



**Figure 4:** A Focus on DEX AOI Region with more significant RSCP coverage improvement (45% to 99%)

**TYDACOMM** antenna solution is immensely more environmentally greener because it has less near-field radiation compared to standard ones by design: energy is taken away from the near-field & redistributed over the far-field.

Meanwhile, complaints from DEX HNI residents vanished, the churn stopped, and the Operator saw a considerable increase in data usage, resulting in increased Revenue and Customer Market Share (RMS & CMS) without the introduction of an additional site within the Estate. The change in revenue more than paid back their entire investment in less than six months. In addition, it saved the CAPEX and OPEX of a new site that would otherwise have been installed. Based on the results the Operator came up with new locations with similar problems for **TYDACOMM** solution to remedy their situation.