



# Small cell backhaul over commodity broadband networks

## Small cells aim to improve experience and lower costs

There is a rapid mass uptake of data-centric devices attached to cellular networks. This poses challenges to network operators both in terms of coverage and capacity. To achieve the desired customer experience and cost level, many operators are placing large bets on small cell deployments. This offload strategy lowers the cost of service delivery by making better use of licensed spectrum.

The supply chain for small cell delivery typically includes suppliers for the core network, RAN, wholesale backhaul and end user equipment. The wholesale backhaul is commodity broadband, which contrasts with the dedicated circuits to macrocell base stations. The mobile operator acts in a systems integration role, devolving responsibility and risk for each area to the appropriate supplier.

The intended outcome is an experience equivalent to (or better than) that from the macrocell network, at a significantly lower cost.

## Small cells create large performance hazards

The network architecture and planning team at the mobile operator will have contracted with each supplier a desired level of performance, and tested the integration in the lab. However, the transition from the lab to the customer environment then proves to be problematic.

The expected offload or coverage improvement is often not achieved. Voice performance and quality is erratic, and service resilience is lower than expected. For example, cells may be switching off their radio and/or restarting.

The fault resolution process then tries to change everything around the cell, modifying configuration parameters in the RAN and upping capacity in the backhaul. This process is frequently unsuccessful, so the operator finds itself doing truck rolls, replacing small cells with the latest model in the hope that it fixes problems. Yet the performance problems continue to manifest themselves.

This creates a large waste of money, and a loss of confidence and credibility in the eyes of the customer, who may then churn. Given the criticality of small cells to the mobile data business model, it runs a systemic corporate risk that could damage investor confidence.

## Ask yourself these questions

- Is the roll out of the small cells proving problematic?
- Is the offload or coverage not improving as expected?
- Is voice performance and quality erratic, and service resilience lower than expected?
- Is my service at risk of losing credibility in the eyes of the customer?

Read on to find an answer to these questions and how our ongoing measurement will assure you remain well informed.

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## Use network performance science to identify and manage the performance hazards

The underlying issue is an assumption that when you compose the system elements, you get the desired service performance level. The mobile operator believes it has outsourced the technical risk to its suppliers – when it has not. The nature of the performance contracts for the small cell deployment do not contain the hazards when composed.

**Fault finding:** We offer a process of measurement and audit that will result in isolation of problem source(s) and identification of the root cause of performance issues. This can isolate general architectural issues, expose supplier non-compliance, as well as highlight specific customer deployment problems.

**Results:** We will offer recommendations both to (1) mitigate the immediate problem – not just confirm that they exist, as well as (2) to re-structure the supply chain contracts so as to prevent their recurrence. We can help you to construct contractual terms to distribute risks appropriately along the supply chain (both technical and commercial). Our robust approach allows you to make the optimal trade-off of performance hazards, technical efficiency, cost and revenue risks.

**Duration:** The process of measurement to final report delivery typically takes 4-8 weeks.

**Assurance:** Where required, we can also audit the suppliers and their adherence to the performance terms, either as a one-off activity or as an ongoing assurance process.

## Avoid embarrassing service failures and unplanned costs

Our network science approach can help you by giving you the information you need to diagnose and mitigate root causes with confidence. We can help you to avoid unnecessary truck rolls and mis-targeted fault resolution processes. Instead, we let you focus your technical resource only where the problems are. Our goal is to raise the capability of your organisation to deal with these complex supply chain issues so that they do not recur. You can then target your technical resources at creating new business value, rather than fault-fixing.

## In collaboration with Predictable Network Solutions

The world's only network performance science company

Predictable Network Solutions (PNSol) was founded in 2003 to provide consultancy on large and complex projects at the leading edge of both technical and commercial feasibility.

Coming from strong scientific and engineering background we quickly found that the available tools and techniques were inadequate for the tasks we were being asked to perform.

Our response was to construct both the mathematical basis and the practical tools that we needed to service our customers' needs.

## Geddes helps...

Geddes helps communications service providers create advanced voice, messaging and broadband services. With a little fresh thinking, you can conjure new value from existing assets. So we create communications services that make everyday business more efficient, effective and secure. Our team has the vision, thinking and insight you won't find anywhere else.