Sharing assets is key to making 5G RAN affordable

Macro network deployment forecast to 2025

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Executive Summary

RAN RESEARCH: THE RESEARCH ARM OF WIRELESS WATCH

"Rethink has a commitment to forecasting markets that others shy away from – those on the verge of radical transformation"

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Introduction

One of the biggest conundrums for mobile operators is that they have built their success so far almost entirely on outdoor networks. In the 2G and 3G days, most mobile usage took place outside because, once indoors, people made calls and checked emails on cheaper, faster fixed lines. But when 4G ushered in real demand for large amounts of mobile data, and people started to use their mobile devices in their homes and offices instead of landlines, the outdoor-in model started to creak. In-building penetration has proved inadequate for high quality data traffic to reach users in large offices or homes.

Yet most mobile network operators (MNOs) have struggled to find a compelling business case to deploy small cells or localized 'sub-nets' indoors, leaving them in a predicament as they start to explore new revenue streams for 5G – many of which are enterprise-driven, and so require excellent quality of service within buildings as well as outside them.

Rethink covers the indoor issues, and the deployment forecasts in that environment, in separate reports, as well as the new models – from open source platforms to neutral host – that may finally deliver high quality 5G to every corner. But the challenge for MNOs, that much of the traffic growth, and associated revenue growth, in 5G will take place inside can obscure the very real challenges that also face them outdoors.

The first 5G deployments clearly show that most MNOs are initially thinking in the same old way when it comes to planning their new networks. A few years ago, there was much discussion about a 'small cell-first' approach to early 5G, in which LTE would continue to deliver wide area outdoor coverage, while the operators would add hotzones of capacity, many of them within buildings, to augment LTE in a targeted way, support enterprise users and move towards the kind of 'indoor-out' model that cablecos have supported with their WiFi homespots.

That vision has failed to materialize, however well it aligned with the real needs of the network – after all, LTE has plenty of performance life in it, and could well be upgraded or expanded multiple times to enhance the outdoor, wide area network. But this is the network the MNOs understand best, and where they have the best skills and expertise to bring to bear – from negotiating the best deals with suppliers to planning and optimizing the cells. In most cases, they have effectively launched '4G-plus' – using a 5G New Radio (NR), but on the same LTE sites, and using the LTE core in 5G NR's Non-Standalone (NSA) mode.

This is not true 5G, but it gives them a boost both in performance (mainly through new spectrum and antennas supported by NR) and in marketing. But this is a temporary solution, which will last only a year for some operators – though five or more for others – before they have to face the real challenges of a 5G migration. Those will be deploying a cloud-native 5G core and a Standalone RAN; and extending the network to the main sources of new revenue, which are likely to be people and 'things' that are moving between indoor and outdoor environments.

To contemplate these migrations, operators must make sure that the outdoor, wide area macro network they know so well is as efficient and profitable as possible in this first, simplified 5G phase, and that the cost of upgrading and running it in the 2020s is kept as low as possible. If an MNO decides to cede the indoor and enterprise networks to partners such as private operators or neutral hosts, it will need an excellent wide area platform to connect all those players and still enhance its core consumer mobile broadband offering. If it decides to deploy enterprise networks itself, it will need its main platform to be very lean and profitable to support that investment.

This report will examine three ways in which MNOs are looking to make their 5G macro networks efficient and profitable, and to form a strong base for future expansion into newer topologies and markets. The focus is not on the impact of virtualization on the RAN, or of core network developments – those will be analyzed in a forthcoming new report. Instead, we have gone back to basics and surveyed 78 global MNOs about the most important factors in making their physical RANs cost-effective in the short-to-medium term (years 1 to 6 of commercial 5G).

The three factors which were most cited in that survey were:

- Leveraging existing 4G assets, such as sites and the core, as much as possible in the 5G launch.

- Planning for increased levels of sharing of assets such as sites, fiber and even active RAN.

- New base station form factors, notably the 'mini-macro', which will improve urban coverage and capacity outdoors (and which are increasingly distinct from the 'small cell' form factors which will be important indoors).

Figure 1 indicates the level of expected adoption of these three tactics to prolong the investment in 4G even as all the marketing is moving to 5G, and to ease future migration to full, standalone 5G networks.

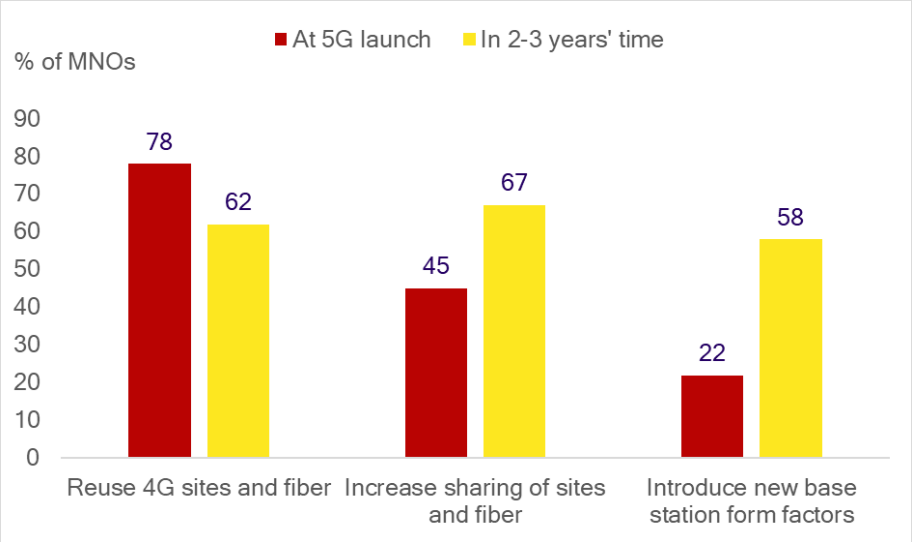

Figure 1. Percentage of MNOs expecting to adopt key tactics for cost-efficiency in 5G outdoor RAN, at launch and in 2-3 years of launch.
(Note, 78 MNOs were asked to name all the tactics which would help to achieve cost-efficient 5G outdoor RAN. These were the three most commonly cited. The MNOs were then asked whether they would adopt these three.)

This report will examine these three factors, to help understand the new economics of the outdoor 5G RAN in an increasingly indoor mobile world.

Note: We refer to three categories of outdoor base station in this report – macrocell, microcell and mini-macro. All these are subject to a wide variety of definitions by different organizations. In this report, a macro site is tower-mounted, a micro site is roof- or pole-mounted, and a mini-macro is a macro-capable base station which can be mounted on street furniture. In this report, we exclude indoor base stations, and outdoor 'small cells' which operate at very low power.

In the forecasts, figures refer to radio units. In conventional architectures, these will coexist with the baseband unit and there will be one baseband per cell site (often at the base of the tower). But in a virtualized or centralized RAN, a number of the radio units might share one baseband unit. Multiple operators may install their radio units on a single cell site.

Methodology

This document contains explanatory notes and commentary to accompany the Excel file **'Rethink RAN Service Macro Network Deployment Trends 2018-2025'**.. That contains further data breakdowns including regional patterns. The surveys and forecasts on which the outputs are based were conducted in July to September 2019.

There were 78 responses from Tier 1 and Tier 2 mobile operating companies worldwide. The sample was restricted to operators with plans to deploy 5G commercially before 2024. The commentary refers only to a selected number of the 17 data tables included in the Excel data module. Additional tables are included in the spreadsheet with additional regional and other breakdowns.

The wireless forecast included in this report is based on research on the top 40 international mobile operator groups, which account for 80% of the global mobile subscribers (IMG-40). From this representative group of operators, the macrocell and metrocell forecasts are developed.

Who should buy this report?

This report is critical to anyone involved in planning for the introduction of 5G technology to their networks, as well as technology partners, implementers, equipment suppliers, software providers and investors, at C Suite level down to product marketing and product planning. The RAN Research arm of Rethink Technology Research is essential reading for anyone who wants to stay on top of current trends and thinking among MNOs. It's like being a fly on the wall in their planning meetings and is based on questions MNOs have answered about their planned and future expenditure.

This report will;

- Give you a spreadsheet which will help with Macro Level plans
- Examine three different approaches to build 5G networks at the Macro level
- How MNOs can best leverage 4G assets in the process, such as cell sites and the core
- It will highlight which parts of the network best lend themselves to asset sharing
- And introduces new base station form factors to improve outdoor capacity
- All Ran Research reports helps you better plan your capex.

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Each module of RAN Research costs $2,000 for a single, individual license, and $4,000 for a corporate license for any individual report such as this one. This is the price for 'Sharing assets is key to making 5G RAN affordable' and for any previous reports. The entire service can also be purchased as a subscription, which comes with 6 reports each year. Ask for pricing details.

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Please follow the link to our store or email john@rethinkresearch.biz

This report has been compiled by our Head of Research, Caroline Gabriel who can also be emailed at caroline@rethinkresearch.biz

The Rethink RAN Research process summarized

These forecasts were based on a combination of data from:

- Detailed surveys, interviews and operator-by-operator modeling of the IMG-40 groups.
- Studies and modelling of the deployments and strategies of the top 100 4G operators, as tracked by Rethink Technology Research's quarterly surveys, interviews and desk research.
- A survey of 83 Tier 1 and Tier 2 mobile and converged operators about their detailed plans for RAN deployments to 2025.
- Input from ecosystem vendors on shipments, technology strategies and competitive landscape, also updated quarterly.
- Interviews with other stakeholders such as IoT services providers and enterprises
- A calculation of the resources required in each type of location to achieve the MNOs' stated objectives.

Most of the forecasts refer specifically to nodes deployed within MNO networks, either by themselves or by partners. MNOs may also make use of third party nodes deployed outside their network and connected by wireline or WiFi; and many edge cloud services will run on infrastructure that is not used by MNOs at all.

RAN Research: Forecasting disruption in wireless

Rethink Technology Research is a specialized research and consulting firm with 12 years' experience in surveying wireless, broadband, over-the-top and quad play operators. This has resulted in a broad research base of over 140 service providers (MNOs, telcos, cable and satellite operators, over-the-top providers) worldwide. These organizations are surveyed on a regular basis about their network infrastructure and business plans, and have a relationship of trust with Rethink.

Rethink also has deep relationships with the telecoms ecosystem (tier one device OEMs, vendors, technology developers, integrators, regulators etc), and is perceived as a thought leader in many areas of the telecoms and media sectors. Key areas of expertise and research experience include HetNet migration, small cells and carrier WiFi; transformation strategies for the RAN and the BSS/OSS; convergence of IT and network skills and platforms; device and chipset roadmaps; spectrum strategy.

Here are some sample titles of reports we have produced recently:

- RAN automation is central to the 5G case—but is it a distant dream?
- Open RAN architecture set to disrupt 5G landscape
- Making the mobile enterprise a reality at last?

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About Rethink Technology Research

Rethink is a thought leader in quadruple play and emerging wireless and IoT technologies. It offers consulting, advisory services, research papers, plus three weekly research services; Wireless Watch, a major influence among wireless operators and equipment makers; Faultline, which tracks disruption in the video ecosystem, and OTT video. Riot on enterprise disruption from the combination of AI/IoT and cloud.

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