Well-defined network metrics are fundamental to optimising capex beyond 4G

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MNOs have reported that capex has accounted for more than 10% of revenue since launching 4G networks. This is unlike the 2G and 3G eras when capex was significantly lower.

Carrier aggregation (CA) is gaining momentum; 3CA was launched in South Korea in January 2015, and 4CA and 5CA are expected in 2017 and 2019 respectively. Furthermore, it is expected that operators will need to continue to invest in 4G for the foreseeable future because 5G is not expected until after 2020. Declining EBITDA margins are also putting operators under pressure to improve their ability to monetise future network investments.

Increased financial pressure demands stronger justifications for future network investments

Chief financial officers (CFOs) are increasingly focusing on network cost reduction. Long-term network cost reduction relies on changes in network architecture (for example, cloud RAN, HetNet) and adoption of new technologies (for example, NFV/SDN, solar power), which require detailed study conducted by both network and finance departments.

It is also possible to optimise ongoing investments in network deployment and CFOs are asking network departments to justify capex. However, the lack of an agreed and quantified approach often creates tension and can render the discussion into a deadlock.

Traffic was highly correlated to revenue in the 2G and 3G world but this is no longer the case in the 4G world. With 4G, additional capacity deployment to improve headline speeds and user experience increases realisable user throughput but can also lead to a lower 'network utilisation'.

Therefore, new KPIs linked to revenue generation are needed to justify investment in CA. A better user experience may be correlated to higher ARPU and/or lower churn rate.

Figure 1: Evolution of network metrics [Source: Analysys Mason, 2016]

	Past	Present	Future
Unit of measure	Erlangs	Megabits per second	To be defined
Rule for investment	Utilisation rate	User throughput and experience	Revenue generation potential and device compatibility
Department	Network	Network	Network and marketing

Designing a new set of network metrics requires alignment between network, marketing and finance departments

Network metrics are traditionally the network team's sole responsibility. However, given that the network department does not have access to subscriber revenue and/or margin data, the marketing team needs be jointly responsible for the metrics that affect revenue potential. The resultant output would then be used to justify planned investments to the finance department.

Operators need to establish an analytical and data-driven approach to network metrics that forms the foundation for capex optimisation and sets up a common language for discussion between network, marketing and finance departments.

- **Marketing:** CA needs objectives and customer segmentation. Initial 4G deployments involved an almost nationwide deployment of the base 4G layer, but CA coverage is likely to be more selective. Revenue and/or margin parameters should be assessed as part of the process to shortlist sites for network investments. Revenue or margin metrics can be either related to the total revenue that a site generates or the types of customers that generate revenue at different types of sites (focusing on high-ARPU or highly profitable customers). Quadruple-play operators may also need to consider the extent of non-mobile service bundling for mobile customers as churn on mobile may have a corresponding impact on other non-mobile services.
- **Network:** Besides monitoring traditional network parameters (for example, busy-hour traffic, user throughput, attached users), network teams will need to consider monitoring the availability of appropriate CA devices on a site-by-site basis. There is also a need to create appropriate data sets for network investment prioritisation through a data analytics approach ensuring robust data sets with commercial inputs (revenue and/or margins) in addition to network traffic. Given future budgetary constraints, network departments should have joint responsibility with marketing and finance teams for prioritising congested sites for expansion.
- **Finance:** It is imperative that the process for prioritising network investments is clearly defined and fulfils both financial and market objectives. The new process must be put into practice and used for future budget planning and approval exercises.

After developing the agreed set of network metrics, telecoms operators will need to conduct an internal pilot project to test the revised network metrics. This project might involve the Information Systems department to automate reporting.

Designing a new set of metrics that can be used by marketing, network and finance departments will enable operators to reap the following benefits:

- alignment between commercial strategy execution and network deployment
- reduction in conflicts in budgeting and network investment approval process
- prioritisation of future investments based on revenue potential, which will maximise return on investments.

Analysys Mason has extensive experience of working with operators in developing their LTE business strategy – including technology strategy, pricing data bundles, network sharing network costing and network roll-out optimisation. For further information, please contact Dion Teo at dion.teo@analysysmason.com.

