

# GROWTH OPPORTUNITIES FOR TOWERCOS IN DEVELOPED MARKETS

Network upgrade and densification potential

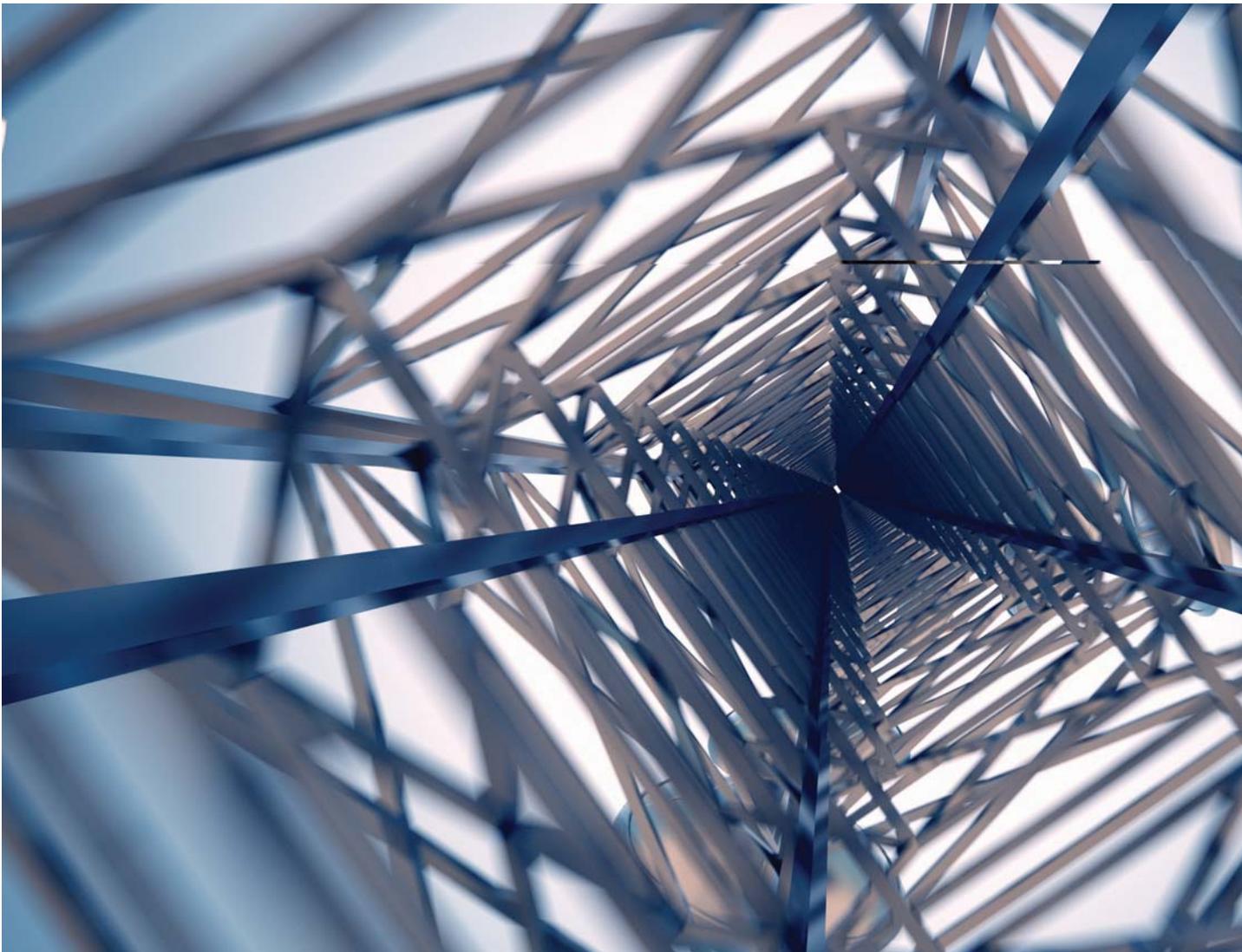
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# Introduction

“The traditional coverage and capacity lead growth is losing steam for TowerCo’s in developed markets. However, MNOs seeking to improve quality presents a future growth opportunity.”

Traditionally, TowerCos have sought to drive revenue growth by increasing tenancy ratios on their portfolio of sites. Ongoing demand from operators for greater network coverage and, to a lesser extent, network capacity led to a sustained period of rising tenancy ratios for TowerCos. This trend is now losing steam, as operators in developed markets, especially in Europe, are not undertaking significant coverage expansion and are partially utilising rooftops and to a lesser extent small cells to provide network capacity. However, there are other sources of revenues from tenants deploying new equipment on existing sites and densifying networks in order to improve the *quality* of data services. At the same time, the investment case is complicated by a number of ongoing trends which pose a risk to future revenues.



# 1 The traditional growth story of TowerCos was based on roll-out to improve network coverage and capacity



When networks were first deployed in the 1990s, mobile operators began with a deployment of sites to provide coverage; as take-up and usage rose, the high demand in dense urban geotypes led operators to deploy new sites to provide additional capacity. This trend created an opportunity for TowerCos to host additional operators on each site. By increasing tenancy ratios, TowerCos were

able to scale up revenues, without a commensurate increase in their relatively fixed underlying cost bases. As such, the tower industry has thrived in the developed markets which adopted the model at an early stage. Although, European markets did not embrace the TowerCo model to the same extent as was seen in the USA.

## 2 In developed markets, this story no longer holds

In developed markets, mobile networks typically cover more than 98% of the population, and the business case for footprint expansion to more rural areas tends to be weak. Instead, competitive forces have led to operators rolling out new technologies (typically 3G and 4G) within their existing footprints. These new technologies are typically deployed through co-location on existing infrastructure.

The rapid ongoing growth in data consumption is creating demand for additional capacity in mobile networks, but the requirement to deploy additional capacity sites is moderated by a number of developments: capacity can be increased by changing or adding to spectrum resources, which are now less scarce than previously, due to regulators releasing additional spectrum (partly as a result of

digital switch-over) and allowing bands previously used for 2G to be freed up for more efficient uses via spectrum refarming. Technological developments have also enabled existing sites to offer greater throughput and a more efficient use of spectrum. Of course, significant capacity roll-outs are continuing; a large share which may be served by rooftop sites and to, a lesser extent in Europe at least, small cell and distributed antenna systems (DAS) deployments. As such, operators' deployments on macro towers for capacity reasons may not be as significant as would be implied by consumer data consumption patterns. TowerCos' ability to monetise the continued demand for rooftop sites is highly dependent on market conditions; in particular, lease agreements with building owners and permitting restrictions.

“Roll-outs of 3G and 4G technologies have been largely collocated on top of MNOs' existing sites.”

## 3 Revenue growth can be achieved from existing tenants upgrading current sites



Mobile operators have always moved quickly to adopt new technologies (mainly 4G), new spectrum bands and emerging solutions such as carrier aggregation and multiple input multiple output (MIMO) antenna technology. Depending on operators' antenna/equipment strategies and the structure of lease agreements, this could represent a growth opportunity for TowerCos.

One of the primary drivers for network evolution is the deployment of new spectrum bands which can be used to support new technologies, improve coverage (with lower frequency spectrum), provide additional capacity or improve achievable individual user throughput using carrier aggregation. This is particularly relevant in light of 700MHz spectrum (released as part of the second digital dividend), which is beginning to become available in Europe and has recently been auctioned in Germany. To deploy new spectrum, operators can either add an additional set of antennas to an existing site, or replace the existing antennas with new multi-band antennas that support both the old and new spectrum bands

Based on current specifications, it is possible for mobile operators to adopt multi-band antennas which would cover all existing and future frequencies, with up to five bands per antenna being technically feasible without increasing the dimensions of the antenna. Indeed, towards the end of 2014, Optus in Australia became one of the first operators in the world to commercially operate 4G across five bands on a single site.<sup>1</sup> However, there is some performance degradation associated with the use of multi band antennas. As such, multi-band antenna deployments have more typically been limited to two or three bands.

At first glance, it seems that the replacement of existing antenna equipment with multi-band equipment would not increase the amount of equipment on towers. However, tower loading can actually significantly increase as a result of deploying multi-band antennas to accommodate additional spectrum bands. The addition of new spectrum bands is likely to result in operators needing to deploy additional electronics (such as remote radio units and combiners), which may increase the total size and loading of the operator's antenna equipment. Indeed, by way of example, an operator in a developed market was replacing 300kg of existing equipment with 1800kg of new integrated antennas on TowerCo sites as part of its move to use multi-band antennas. Furthermore, leading operators (including Vodafone, Deutsche Telekom and Orange) have chosen to deploy integrated radio and antenna systems, which may also be significant in size.<sup>2</sup>

MIMO antenna technology is also being deployed by a large number of European operators, in order to extend the cell range or throughput (by 50-120% at the

cell edge<sup>3</sup> using 4x4 MIMO) without consuming power or bandwidth. The technology enables an operator to transmit and receive multiple copies of the original signal over multiple independent radio paths. This may be a further driver for growth in tower loading.

The extent to which the aforementioned potential growth in equipment on towers leads to revenue growth for the TowerCo is largely dependent on lease agreements' pricing structures. There is no international standard for pricing structures and significant variation is seen between local markets. Pricing structures can be based on unit pricing or a package price.

If unit pricing structures are employed, operators pay for each item of equipment deployed on the site. Indeed, some unit pricing structures, more prevalent in North America, result in operators paying for each spectrum band and/or technology used on the site. As such, in markets where unit pricing is common, the above site upgrade trends are likely to result in a revenue growth opportunity for TowerCos.

If, as is common in Europe, package pricing structures are employed, operators have a set allowance of loading, vertical space and/or weight which can be used without generating additional revenues for the TowerCo. If the operators exceed this allowance, however, additional revenues are generated for the TowerCo. As such, in this case, the specific details of pricing structures and equipment roll-out determine whether there is a growth opportunity for TowerCos from operators deploying additional equipment on existing sites.

<sup>1</sup> Huawei Global Mobile Broadband Forum, November 2014; <https://media.optus.com.au/media-releases/2014/optus-gigasite-trials-exceed-2-3-gbps-on-the-worlds-biggest-and-fastest-mobile-sites/>

<sup>2</sup> Huawei Small Cell & Antenna Strategy Update

<sup>3</sup> Huawei LTE Evolution Path to 2020

# 4 There is also some possibility of new site roll-out for non-traditional reasons

Demand for faster data services and a seamless mobile usage experience is driving mobile operators to re-engineer their networks, either through software and equipment upgrades on existing sites or by increasing the density of their networks. As network 'densification' is pursued, this may represent a further growth opportunity for TowerCos.

As devices become more advanced, there is an increasing demand for higher quality of data services. There is a direct relationship between a user's distance from the cell site and the data speed that can be supported, which means that greater data usage effectively translates into smaller cell radii. Mobile networks have often been planned around a design that was originally optimised for 2G mobile voice services and later for 3G services, but the same broad layout is used as the basis for a network providing high-speed mobile data transfer via LTE. Under such circumstances, there are often quality gaps towards the cell edge, as illustrated in Figure 1.

However, a number of operators have also announced plans to increase the density of their networks to cover the 'quality gaps' and to reduce the distance from the site to the customer (see illustration in Figure 2). The extent to which operators will roll out new sites will depend on competition and market dynamics, as well as the geographical distribution of the population. In practice, operators have used a combination of macro cell, small cells and DAS roll-out in order to achieve faster throughput and better quality of service:

- AT&T in the USA announced in 2012 it would deploy over 10 000 macro sites, 40 000 small cells (which were later partially fulfilled through its acquisition of Leap Wireless) and 1000 DAS as part of its network densification Project Velocity IP (VIP) in order to improve the mobile quality experience for LTE as well as for 3G.<sup>4</sup>

- Sprint's CEO has also recently announced that in addition to using MIMO technology, the 'Sprint Next Generation Network' plan will involve large-scale network densification with a combination of small cells and macro cells to improve both speeds and capacity, to meet its goal to become one of the top two operators in terms of share of subscribers.<sup>5</sup>

- As part of Vodafone's Project Spring, the group has announced that in response to rapidly growing demand for ubiquitous high-speed data, it will invest a total of GBP6 billion over the next three years in its European operations, with a focus on network investment.<sup>6</sup>

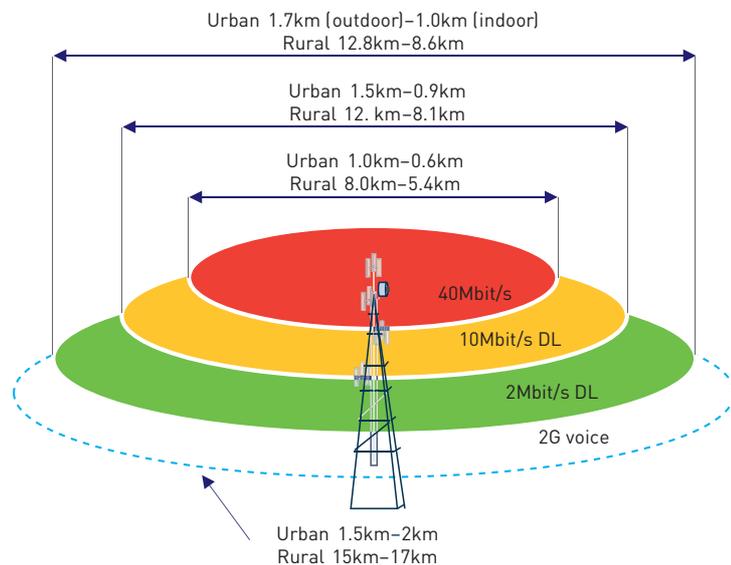


FIGURE 1: ILLUSTRATION OF THE POSSIBLE IMPACT ON THE COVERAGE RADIUS WITH A VARYING QUALITY OF SERVICE, ASSUMING THE TOWER TRANSMITS WITH 2x20MHZ INTRA-BAND CARRIER AGGREGATION IN THE 700MHZ BAND WITH 2x2 MIMO [SOURCE: ANALYSYS MASON, 2015]

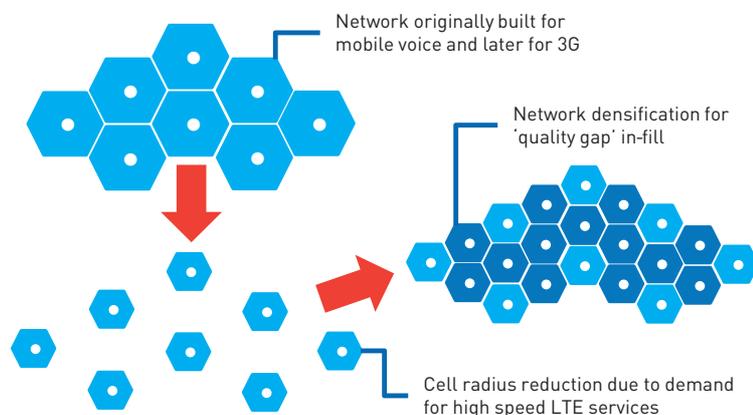


FIGURE 2: EVOLUTION OF NETWORK DESIGN FROM THAT DESIGNED FOR VOICE SERVICES, TO THE CELL RADII REDUCTION RESULTING FROM INCREASED DATA USAGE AND THE CORRESPONDING DENSIFICATION REQUIREMENT [SOURCE: ANALYSYS MASON, 2015]

<sup>4</sup> <http://www.att.com/gen/press-room?pid=23506&cdvn=news&newsarticleid=35661&mapcode=corporate|consumer; http://www.convergedigest.com/2012/11/at-blazes-path-to-wireless.html>

<sup>5</sup> [http://www.fiercewireless.com/story/signals-research-sprints-8t8r-radios-25-ghz-increase-throughput-coverage/2015-05-29?utm\\_medium=nl&utm\\_source=internal](http://www.fiercewireless.com/story/signals-research-sprints-8t8r-radios-25-ghz-increase-throughput-coverage/2015-05-29?utm_medium=nl&utm_source=internal)

<sup>6</sup> <http://www.vodafone.com/content/dam/group/media/downloads/Verizon-Wireless-FINAL.pdf>

## 5 Small cells and DAS may represent a further growth opportunity

Operators are increasingly relying on small cells or DAS in dense urban areas; these solutions can provide a potential revenue opportunity for TowerCos to expand their offering in order to drive growth. Indeed, there are numerous examples of TowerCos moving into the small cell space:

- Cellnex offers small cells and DAS in Italy and Spain as part of its mobile tower portfolio<sup>7</sup>
- Crown Castle has recently been selling international tower portfolios in order to focus on growing its small cell networks<sup>8</sup>

- Arqiva has also recently added small cells as a new revenue stream in the UK.<sup>9</sup>

In the short term, we would expect small cells to represent a smaller opportunity in Europe than in North America

## 6 There are specific risks that are particularly prevalent

On the other hand, there are a number of potential risks to TowerCos operating in developed markets. In particular, network sharing and market consolidation activity may reduce operator demand.

Active sharing of RAN infrastructure and spectrum could pose a significant risk to TowerCos. One way to measure this risk is to understand the degree of network overlap between the operators involved in network sharing; on sites where both operators are co located there is a possibility of losing one tenancy. However, due to the typically long-term nature of TowerCo contracts, the revenues from these tenancies will be protected until the contract expires. Furthermore, protection against site sharing is often built in to contracts to ensure tenants cannot sub-lease to other MNOs.

RAN sharing can also offer some revenue growth potential if a TowerCo is able to attract the other party to its sites. Longer term contracts which include a clause preventing network sharing can encourage this as a network sharing site consolidation exercise will involve identification of matched site pairs. If one of the sites is subject to a long term contract with a

TowerCo, it is more likely that the other will be decommissioned and the TowerCo could see some revenue growth. Indeed, this has been a major driver for some of the recent European deals.

With recent deals in Austria, Germany, Ireland and the UK (awaiting approval), in-country consolidation between mobile operators is a key risk to the TowerCo industry in developed markets. Here too,

geographical analysis can be used to assess the level of risk associated with a merger. Longer-term contracts can also protect TowerCo revenues, until the first contract break-point is reached. Typically, following the network integration of two operators, merged entities have been seen to decommission 20–35% of existing tenancies on TowerCo sites (see Figure 3).

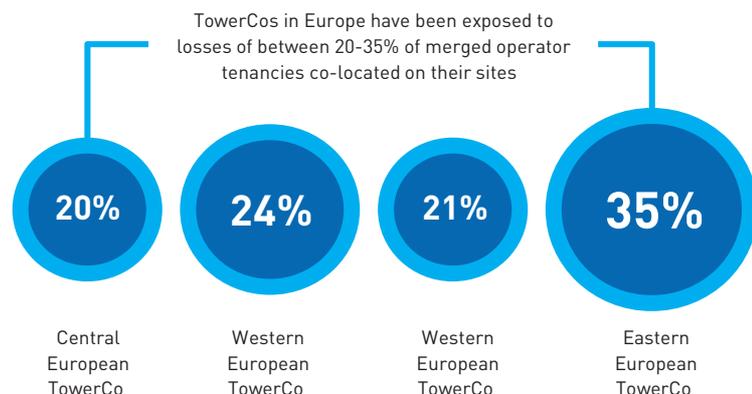


FIGURE 3: ESTIMATED EFFECT OF NETWORK INTEGRATION ON MERGED OPERATOR TENANCIES CO-LOCATED ON A TOWERCO'S SITES<sup>10</sup> [SOURCE: ANALYSYS MASON, 2015]

<sup>7</sup> [http://www.abertis.com/dyndata/Julius\\_-\\_Overview\\_Presentation\\_-\\_20150403v4\\_1.pdf](http://www.abertis.com/dyndata/Julius_-_Overview_Presentation_-_20150403v4_1.pdf)

<sup>8</sup> <http://www.rcwireless.com/20150514/network-infrastructure/towers/crown-castle-sells-1800-towers-to-focus-on-small-cells-tag4>

<sup>9</sup> <http://www.arqiva.com/overviews/mobile-and-telecoms/small-cells/>; <http://www.techweekeurope.co.uk/workspace/virgin-media-arqiva-small-cell-162668>

<sup>10</sup> Includes actually realised decommissioning as well as calculated decommissioning based on a site-by-site analysis; considers only the combined tenancies of the merged operator on the TowerCo and not total TowerCo tenancies

# Conclusion

There are likely to be a number of growth opportunities for TowerCos in developed markets, however the level of growth largely depends on the specifics of the market. The growth potential for new equipment roll-out on existing sites will vary significantly according to operators' antenna strategies and the structure of TowerCo lease agreements. The opportunity arising from increased network density to improve the quality of mobile services will depend on whether operators are actually driven to deploy new sites, which is linked to specific market conditions and the geographical layout of the country. As part of this, TowerCos may also be able to derive new revenue opportunities from small cell and DAS networks. As such, a detailed understanding of the commercial and technical dynamics of the local mobile market is required in order to develop a robust investment case for developed market TowerCos.



# How Analysys Mason can help you in the tower space

Analysys Mason has extensive commercial and technical experience advising on both transaction support assignments and strategy engagements in the tower space. Indeed, we have completed over 100 tower-related projects including buy-side and sell-side due diligence, strategic support to operators considering spin-offs and strategic and operational reviews of TowerCos.

Recent projects include:

- Supporting a mobile operator in a large CEE country in developing a strategy to divest its tower portfolio.
- Commercial and technical due diligence of a major tower company in Western Europe.
- Undertaking the sell side due diligence for a Western European tower portfolio
- Assisting an infrastructure fund acquire a European tower company.



## Contact

If you would like to discuss further how Analysys Mason can help you please contact Brian Burns at [brian.burns@analysismason.com](mailto:brian.burns@analysismason.com)

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